APPENDIX C

# Strategic Environmental Assessment (SEA) for the Christchurch Bay & Harbour FCERM

## Environmental Report

Bournemouth, Christchurch and Poole (BCP) Council, New Forest District Council (NFDC) and the Environment Agency

February 2024

Delivering a better world

Quality information

| Prepared by | Checked by | Verified by | Approved by |
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Revision History

| Revision | Revision date | Details | Name | Position |
|---|---|---|---|---|
| V0 | 7th March 2023 | Draft for internal review | Nick Chisholm-Batten | Technical Director |
| V1 | 04th April 2023 | Draft for client review | Ben Taylor | Project Manager |
| V2 | 01st June 2023 | Update following client review | Ben Taylor | Project Manager |
| V3 | 6th September 2023 | Update following consultation | Ben Taylor | Project Manager |
| V4 | 18th October | Update following further review comments | Jon Short | Deputy Project Manager |
| V5 | 26th October | Update to technical summary following further review comments | Harriet Ridler | Deputy Project Manager |
| V6 | 29th February 2024 | Update following amendments to options | Ben Taylor | Project Manager |

Prepared for:

Bournemouth, Christchurch and Poole (BCP) Council, New Forest District Council (NFDC) and the Environment Agency

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# Non-Technical Summary

## Introduction

AECOM has been commissioned by Bournemouth, Christchurch and Poole (BCP) Council to undertake a Strategic Environmental Assessment (SEA) in support of the emerging Flood and Coastal Erosion Risk Management (FCERM) Strategy for the coastal frontage at Christchurch Bay & Harbour (herein referred to as 'the Strategy').

The Strategy is being developed collaboratively by AECOM and the Project Team, which consists of officers of BCP Council, New Forest District Council (NFDC) and the Environment Agency (EA).

The Strategy extent is the coastal frontage between Hengistbury Head (immediately to the east of Hengistbury Head long groyne) and the landward (western) end of Hurst Spit. Within Christchurch Harbour, the Strategy extent is up to Tuckton Bridge on the River Stour and Knapp Mill on the River Avon.

The SEA process will inform the Strategy, through identification of the likely significant effects of the Short List Options, and any reasonable alternatives, on relevant environmental receptors.

## Structure of this Environmental Report

This report, which follows the Scoping Report completed in December 2021 (and updated in 2023), is the Environmental Report for the Strategy and will be published as an appendix to the StAR (Strategy Appraisal Report).

This report begins by introducing the Strategy, then it outlines the scope of the SEA. It then sets out what plan making/ SEA has involved to this point, followed by the methodology for the assessment of the alternative strategic options within each Option Development Units (ODUs), as well as the assessment itself.

## What is the Strategy seeking to achieve?

The aim of this Strategy is to provide an integrated plan for the Christchurch Bay & Harbour frontage, delivering sustainable and long-term management for coastal flood and erosion risks over the next 100 years. The Strategy will further develop the existing SMP policies adopted in 2011 and update the information provided in the 2012 Christchurch Bay & Harbour FCERM Study, using the most up-to-date data and guidance.

The Strategy will provide an assessment of the risks and opportunities associated with coastal processes and develop a management framework to manage these risks, as well as any opportunities, in a sustainable manner. This will form an important element of the policy for flood and coastal defences and provide guidance for spatial planning within the coastal zone. The Strategy will determine the leading options for flood and coastal defences through multi-variate appraisal including a cost-benefit analysis.

## What is the scope of the SEA?

The SEA scope is summarised in a list of topics, objectives, and assessment questions, known as the SEA framework. These draw on the key sustainability issues identified through scoping. The table overleaf presents the SEA framework as broadly agreed in 2020.

Notably, in the absence of any specific air quality issues, and considering that the Strategy is not likely to significantly affect the air quality SEA topic in the future, this topic was scoped out for the purposes of the SEA process. Potential localised changes to air quality were noted during the scoping phase, arising from construction activities. However, during scoping this was considered not likely to lead to significant changes in the current air quality baseline.

| SEA topic | SEA objective | Assessment questions (will the proposal help to…) |
|---|---|---|
| Biodiversity and geodiversity | To protect and enhance biodiversity and geodiversity habitats and species; achieving biodiversity net gain and improved habitat connectivity within the Strategy area. | • Protect and enhance European, nationally and locally designated sites, including species that are important to the integrity of these sites and recognised as priority species?<br>• Protect, enhance and improve connectivity of habitats?<br>• Support the delivery of biodiversity net gain?<br>• Support habitat creation, restoration and recovery in the coastal zone?<br>• Increase the resilience of biodiversity in the Strategy area to the effects of climate change through increased coastal flooding and erosion? |
| Climate change | To support the resilience of the Strategy area to the potential effects of climate change, including coastal flooding and erosion. | • Contribute to adapting to climate change?<br>• Contribute to mitigating the main causes of climate change by promoting low or zero carbon approaches? |
| Landscape | To protect and enhance the character and quality of the Strategy area landscape and seascape. | • Conserve and enhance the quality of landscape/ seascape for people, places and nature?<br>• Contribute to better management of landscape/ seascape assets?<br>• Conserve and enhance features of local importance?<br>• Improve linkages to the coastline?<br>• Protect visual amenity? |
| Historic environment | To protect, conserve and enhance the historic environment within the Strategy area. | • Conserve and enhance heritage assets and their settings, considering the unique nature of heritage assets in the Strategy area and how they may be impacted by coastal defences?<br>• Conserve and enhance the special interest, character and appearance of locally important features and their settings?<br>• Consider the contribution of historic places to the character of the coastal environment?<br>• Support access to, interpretation and understanding of the historic environment and character of the Strategy area?<br>• Support the undertaking of early archaeological investigations and, where appropriate, recommend mitigation strategies? |
| Land, soil and water resources | To ensure the efficient and effective use of land in the Strategy area. | • Protect and conserve soils and improve resilience to degradation?<br>• Protect and conserve the best and most productive agricultural land?<br>• Prevent contamination from historic landfill sites and support remediation? |
| | To protect and enhance water quality and manage water resources within the Strategy area in a sustainable manner. | • Help secure compliance with the Water Framework Directive and contribute to enhancing the status of water bodies?<br>• Contribute to the sustainable management of water resources and fisheries? |
| Population and communities | Protect and enhance the health and wellbeing of the community within the Strategy area. | • Protect and improve the resilience of communities?<br>• Improve and enhance the health and wellbeing of communities?<br>• Improve access to the coastal environment?<br>• Support the provision of more, better quality and accessible green infrastructure/ open space?<br>• Avoid negative impacts to the quality and/ or extent of existing recreational assets, including coastal footpaths? |

# What has plan-making involved to this point?

Work on the Strategy has been underway for some time and the aim here is not to provide a comprehensive explanation of all the work carried out to date. Rather the intention is to provide a high level explanation of the work undertaken to develop and appraise options.

More specifically, this part of the report introduces the Strategic Management Zones (SMZs) and the Option Development Units (ODUs) that have been developed for the Strategy frontage. It then goes on to explain how the options under each ODU were established.

## Strategy Management Zones

The Strategy consists of six Strategy Management Zones (SMZs), which are:

- **SMZ 1 (Mudeford Sandbank)** covers Hengistbury Head to the east of the Long Groyne and Mudeford Sandbank. Both the open coast and harbour sides of Mudeford Sandbank are included in this SMZ.
- **SMZ 2 (Christchurch Harbour)** covers the coastline around Christchurch Harbour, up to Knapp Mill on the River Avon and Tuckton Bridge on the River Stour.
- **SMZ 3 (Christchurch Beaches and Cliffs)** covers the Avon Beach and Highcliffe parts of the frontage.
- **SMZ 4 (Naish Cliff and Barton on Sea)** covers the area between Chewton Bunny to the eastern end of the Barton on Sea coastal defences.
- **SMZ 5 (Taddiford)** covers the area between Barton on Sea and Hordle Cliff. The west boundary of the unit is at the eastern end of the Barton on Sea defences and the east boundary is at West Road (western end of the Hordle beach huts).
- **SMZ 6 (Milford on Sea)** covers the 2.3km frontage between Hordle Cliff and the eastern end of Milford on Sea.

## Option Development Units

Option Development Units (ODUs) have been developed for each SMZ, and these are set out below:

- SMZ 1 (Mudeford Sandbank):
  - **ODU 1: Hengistbury Head East**
  - **ODU 2: Mudeford Sandbank**
- SMZ 2 (Christchurch Harbour):
  - **ODU 3: Christchurch Harbour South**
  - **ODU 4: Wick**
  - **ODU 5: Willow Drive and the Quomps**
  - **ODU 6: River Avon West Bank**
  - **ODU 7: Rossiters Quay**
  - **ODU 8: River Avon East Bank**
  - **ODU 9: Stanpit**
  - **ODU 10: Mudeford**
  - **ODU 11: Mudeford Quay**
- SMZ 3 (Christchurch Beaches and Cliffs):
  - **ODU 12: Avon Beach and Friars Cliff**
  - **ODU 13: Highcliffe**
- SMZ 4 (Naish Cliff and Barton on Sea):

  - **ODU 14: Naish Cliff and Barton on Sea**

- SMZ 5 (Taddiford):
  - **ODU 15: Barton on Sea to Hordle Cliff**
- SMZ 6 (Milford on Sea):
  - **ODU 16: Cliff Road**
  - **ODU 17: Rook Cliff**
  - **ODU 18: Milford on Sea Frontage**

## Establishing ODU options

The Short List Options Report, undertaken by AECOM (2023), represents Stage 4 of the options appraisal for the Strategy, in which a draft short list of options is presented. The short list of options comprises a list of high-level strategic options for each SMZ, as well as the supporting appropriate local measures identified for implementing these strategic options in each ODU.

This was followed by Stage 5 of the options appraisal, where the draft short list of options was presented to the public and key stakeholders for review and feedback. This took place in March 2023. Updates to the short list of options were then made to reflect key feedback. Further work was then undertaken to develop the short list of options in more detail (Stage 6) to inform the selection of the leading option(s) (Stage 7).

## Selecting Leading Options

An economic, environmental, technical and social appraisal was undertaken to select the Leading Options from the short list. Full details of this can be found in the Leading Options report (AECOM, 2024). The findings from the SEA fed into the decision-making criteria and formed the environmental appraisal element of the option appraisal process. Up to three types of Leading Option were selected in each ODU:

- The National Economic Leading Option: this is the Leading Option which is identified by following the Environment Agency's Flood and Coastal Erosion Risk Management Appraisal Guidance.
- The Local Aspirational Option: this option considers local opportunities, wants and needs to deliver wider benefits. This option typically costs more than the National Economic Leading Option.
- Backup Option: this option has been identified where there is a large funding shortfall. It is typically a lower cost option that will be more easily funded if funding is limited.

# SMZ 1 – ODU 1: Hengistbury Head East options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Improve**: new rock revetment (from epoch 1) aiming to minimise any further erosion of the cliff top.
4. **Managed Realignment**: refurbishment of existing defences from epoch 1 and ongoing beach recycling; this would not alter the geometry of the existing defences (e.g. footprint/ height of defences would remain the same as today). The intent would be to let the cliff erode in a controlled manner. Whilst the defences would provide protection to the cliff toe, other erosion processes such as weathering could still lead to recession of the cliff top over time.

## Assessment findings

| | Option number | | | |
|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 |
| Biodiversity and geodiversity | - | - | 0 | + |
| Climate change | -- | -- | + | ? |
| Landscape | -- | -- | - | + |
| Historic environment | -- | -- | - | - |
| Land, soil and water resources | 0 | 0 | 0 | 0 |
| Population and communities | - | - | + | + |
| Transport and movement | - | - | + | + |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

## Leading option selection

Two Leading Options were selected for ODU 1 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Do Minimum.
- Local Aspirational Option: Managed Realignment.

Delivery of the Local Aspirational Option (Managed Realignment) is likely to lead to greater environmental benefits as indicated by the SEA. However, funding is not certain and if funding cannot be achieved the National Economic Option (Do Minimum) would be delivered.

# SMZ 1 – ODU 2: Mudeford Sandbank options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure H&S compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences from epoch 1; this would not alter the geometry of the existing defences (e.g. footprint/ height of defences would remain the same as today); this option also includes beach recycling to help sustain the beach levels. Beach nourishment from epoch 3 to sustain beach levels in line with sea level rise. Objective of this option would be to sustain the service of the Sandbank (in FCERM terms) and aim to hold the Sandbank in its current position. Opportunities for sand dune creation / restoration as part of this option would be explored.
4. **Improve**: same approach as Maintain over epochs 1 and 2. However, in epoch 3 upgrade the defences to provide a more robust defence system. This would likely involve constructing new larger rock revetment along the length of the Sandbank, rock groynes and a beach nourishment scheme.
5. **Managed Realignment**: same defence measures as Maintain through the appraisal period. However, intent of this option would be to allow the Sandbank to rollback over time in a controlled manner, whilst sustaining the FCERM service. Existing rock revetment and groynes could be moved over time to encourage / control the rollback process and beach recycling would be used to move material to the desired locations.
6. **Maintain with Adaptation/ Resilience**: same approach as the Maintain option, but with local level property level protection measures to the small number of permanent properties on the Sandbank.

## Assessment findings

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** |
| Biodiversity and geodiversity | ? | ? | + | + | ? | + |
| Climate change | -- | -- | ++ | ++ | ++ | ++ |
| Landscape | -- | -- | + | + | ? | + |
| Historic environment | -- | -- | + | + | - | + |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | - | -- | + | + | + | + |
| Transport and movement | 0 | 0 | 0 | 0 | 0 | 0 |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading option selection

Two Leading Options were selected for ODU 2 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Do Minimum.
- Local Aspirational Option: Maintain with Adaptation.

Delivery of the Local Aspirational Option (Maintain with Adaptation) is likely to lead to environmental benefits across a range of categories as indicated by the SEA. There are also opportunities for BNG with this option such as Sand Dune creation. However, funding is uncertain and if funding cannot be achieved the National Economic Option (Do Minimum) would be delivered.

# SMZ 2 – ODU 3: Christchurch Harbour South options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing seawall defences (as and when required).
3. **Maintain A**: small-scale patch-repair to existing seawall defence (as and when required), but new slope armouring (erosion defence) adjacent to road access point to Hengistbury Head (epoch 1).
4. **Maintain B**: as per Option 3 (Maintain A), but also with new slope armouring (erosion defence) adjacent to historic landfill site in north-west part of the unit (to prevent this eroding) (epoch 1).
5. **Adaptation/ Resilience A**: property level protection measures to the small number of properties at risk of flooding (from epoch 1). No erosion defences to access road or historic landfill site.
6. **Adaptation/ Resilience B**: as per Option 3 (Maintain A), but with property level protection to the small number of properties at risk of flooding (from epoch 1).
7. **Adaptation/ Resilience C**: as per Option 4 (Maintain B), but with property level protection to the small number of properties at risk of flooding (from epoch 1).

## Assessment findings

| | Option number | | | | | | |
|---|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| Biodiversity and geodiversity | - | - | 0 | 0 | - | 0 | 0 |
| Climate change | ? | ? | ? | ? | + | + | + |
| Landscape | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Historic environment | - | - | ? | ? | - | ? | ? |
| Land, soil and water resources | ? | ? | + | ++ | ? | + | ++ |
| Population and communities | ? | ? | + | + | + | ++ | ++ |
| Transport and movement | ? | ? | ++ | ++ | ? | ++ | ++ |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading option selection

Two Leading Options were selected for ODU 3 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Adaptation / Resilience A.
- Local Aspirational Option: Adaptation / Resilience C.

Delivery of the Local Aspirational Option (Adaptation / Resilience C) is likely to lead to environmental benefits under the transport and movement, land, soil and water resources, and population and communities SEA topics as indicated by the SEA. However, funding is uncertain and if funding cannot be achieved the National Economic Option (Adaptation / Resilience A) would be delivered.

# SMZ 2 – ODU 4: Wick options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure H&S compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences from epoch 1.
4. **Sustain A**: construct new sheet pile/ quay wall along the frontline in the western part of the unit (fully replacing the existing sheet pile wall, epoch 1); in the eastern part of the unit, raise and lengthen the existing setback embankment (epoch 1); continue to raise and lengthen the defences over time to keep pace with SLR (epochs 2 and 3).
5. **Sustain B**: undertake repeat refurbishments of the existing frontline sheet pile wall in the western part of the unit over time; elsewhere raise and lengthen the existing setback embankment (epoch 1) and continue to do this to keep pace with SLR (epochs 2 and 3).
6. **Sustain C**: raise and lengthen the existing setback embankment over time to keep pace with SLR (epoch 1, then in epochs 2 and 3); do not maintain the existing sheet pile wall, leaving this to eventually fail; the sheet pile wall currently protects historic landfill, so risk of this eroding in the future when the wall fails.
7. **Improve A**: same as Sustain A, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).
8. **Improve B**: same as Sustain B, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).
9. **Improve C**: same as Sustain C, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).

## Assessment findings

| | Option number | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Biodiversity and geodiversity | ? | ? | 0 | + | + | 0 | + | + | 0 |
| Climate change | -- | -- | - | ++ | ++ | + | ++ | ++ | + |
| Landscape | ? | ? | ? | - | - | - | - | - | - |
| Historic environment | -- | -- | - | ++ | ++ | - | ++ | ++ | - |
| Land, soil and water resources | -- | -- | + | ++ | ++ | -- | ++ | ++ | -- |
| Population and communities | -- | -- | - | ++ | ++ | -- | ++ | ++ | -- |
| Transport and movement | -- | -- | - | ++ | ++ | - | ++ | ++ | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading option selection

Two Leading Options were selected for ODU 4 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Sustain C.
- Local Aspirational Option: Sustain B.

Delivery of the Local Aspirational Option (Sustain B) is likely to lead to environmental benefits across a range of categories as indicated by the SEA. However, funding is uncertain for this option as the increase in cost is largely associated with maintaining the frontline quay wall to prevent erosion of the historic landfill which does not currently attract funding as part of the Environment Agency's Partnership Funding process. If funding cannot be achieved the National Economic Option (Sustain C) would be delivered. There are opportunities for BNG for both options but the Local Aspirational Option is the more environmentally sustainable option as it would help prevent potentially negative impacts in the land, soil and water and population and communities categories.

# SMZ 2 – ODU 5: Willow Drive and the Quomps options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure H&S compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences through the appraisal period (from epoch 1).
4. **Sustain A**: construct a new frontline wall in the western part of the unit (along alignment of the existing quay wall) (epoch 1); this would incorporate a raised wall relative to ground levels to provide a flood defence, which would be further raised over time as sea levels rise; in addition, raise and lengthen the existing setback wall in the eastern part of the unit over time as sea levels rise (epoch 1, then epoch 2 and 3); maintain the frontline quay wall in the eastern part of the unit to prevent erosion of historic landfill site (epochs 1-3). Also includes Sustain D with delayed initial intervention.
5. **Sustain B**: construct a new frontline wall along the full length of the unit (along alignment of the existing frontline quay wall) (epoch 1); this would incorporate a raised wall relative to ground levels to provide flood defence, which would be further raised over time as sea levels rise (epochs 2 and 3). Also includes Sustain E with delayed initial intervention.
6. **Sustain C**: construct a new setback wall in the western part of the unit in the future (epoch 3); in addition, raise and lengthen the existing setback wall in the eastern part of the unit over time as sea levels rise (epoch 1, then epochs 2 and 3); maintain the frontline quay wall to prevent erosion of historic landfill (epochs 1-3). Also includes Sustain F with delayed initial intervention.
7. **Improve A**: as per Sustain A, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3). Also includes Improve D with delayed initial intervention.
8. **Improve B**: as per Sustain B, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3). Also includes Improve E with delayed initial intervention.
9. **Improve C**: as per Sustain C, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3). Also includes Improve F with delayed initial intervention.
10. **Adaptation / Resilience**: same approach to defence maintenance as Maintain, with property level protection to properties at risk of flooding.

## Assessment findings

| | Option number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Biodiversity and geodiversity | ? | ? | ? | + | + | + | + | + | + | ? |
| Climate change | -- | -- | - | ++ | ++ | + | ++ | ++ | + | - |
| Landscape | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? |
| Historic environment | -- | -- | - | + | ? | + | + | ? | + | - |
| Land, soil and water resources | -- | -- | + | ++ | ++ | ++ | ++ | ++ | ++ | + |

| | Option number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Population and communities | -- | -- | - | ++ | ++ | ? | ++ | ++ | ? | - |
| Transport and movement | -- | -- | - | ++ | ++ | + | ++ | ++ | + | - |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading option selection

Three Leading Options were selected for ODU 5 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve D-F.
- Local Aspirational Option: Improve A-C.
- Backup: Adaptation / Resilience.

Delivery of the National or Local Aspirational Options (Improve A-F) is likely to lead to environmental benefits across a range of environmental categories as indicated by the SEA. Each of these options has potential to deliver BNG and opportunities will be investigated during further appraisal / design work. However, at this stage funding is uncertain for the Improve options and if funding cannot be achieved the Backup option (Adaptation / Resilience) would be delivered.

# SMZ 2 – ODU 6: River Avon West Bank options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences. Ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Sustain A**: construct a new frontline / setback defence in the southern part of the unit (epoch 1) at Priory Quay and Convent Meadows. This would be raised over time to keep pace with sea level rise (epochs 2 and 3). In the central part of the unit in proximity to Castle Street, construct a new defence, raised over time to keep pace with sea level rise (epochs 2 and 3).
5. **Sustain B**: construct a new frontline / setback defence in the central part of the unit (epoch 1) in proximity to Castle Street and then raise it over time to keep pace with sea level rise (epochs 2 and 3). In the south part of the unit implement property level protection throughout appraisal period to properties at risk from flooding, but no new raised defences here.
6. **Improve A**: as per Sustain A, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).
7. **Improve B**: as per Sustain B, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).
8. **Adaptation / Resilience**: implement property level protection to the properties at risk from flooding throughout the appraisal period, mainly focussed in the south (Priory Quay / Convent Meadows) and central part (Castle Street) of the unit.

## Assessment findings

| | Option number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| Biodiversity and geodiversity | ? | ? | 0 | - | - | - | - | 0 |
| Climate change | -- | -- | -- | ++ | + | ++ | + | - |
| Landscape | ? | ? | ? | - | - | - | - | ? |
| Historic environment | -- | -- | -- | - | - | - | - | - |
| Land, soil and water resources | ? | ? | ? | ? | ? | ? | ? | ? |
| Population and communities | -- | -- | -- | ++ | + | ++ | + | - |
| Transport and movement | -- | -- | -- | ++ | + | ++ | + | - |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading Option selection

One Leading Options was selected for ODU 6 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Adaptation / Resilience.

There are likely to be negative environmental impacts associated with the Adaptation / Resilience option. However, there is not an economic case to deliver any of the alternative Do Something options considered and therefore the Adaptation / Resilience option is the viable way forward. The alternative is to undertake Do Nothing or Do Minimum.

# SMZ 2 – ODU 7: Rossiters Quay options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Sustain A**: construct new defences (epoch 2) consisting of a setback defence and a new quay wall with a raised front wall; raise the defences over time to keep pace with SLR (epoch 3).
5. **Improve A**: as per Sustain A, except the defences are constructed to the full height initially and not raised over time (e.g. no new construction in epoch 3).
6. **Adaptation / Resilience**: implement property level protection to the properties at risk from flooding throughout the appraisal period and maintain existing defences.

## Assessment findings

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** |
| Biodiversity and geodiversity | ? | ? | ? | - | - | ? |
| Climate change | -- | -- | - | + | + | - |
| Landscape | ? | ? | ? | - | - | ? |
| Historic environment | -- | -- | - | + | + | - |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | + | + | - |
| Transport and movement | -- | -- | - | + | + | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

## Leading option selection

Two Leading Options were selected for ODU 7 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve A.
- Backup: Adaptation / Resilience.

Delivery of the National Economic Option (Improve A) is likely to lead to environmental benefits in the climate change, historic environment, transport and movement and population categories as indicated by the SEA. However, funding is uncertain and if funding cannot be achieved the Backup (Adaptation / Resilience) would be delivered.

# SMZ 2 – ODU 8: River Avon East Bank options assessment

As outlined in the Leading Option Report (AECOM, 2023), options in ODU 8 have not been appraised fully as part of the Strategy as it was agreed that options for managing the flood risk would be developed as part of future projects on the Lower River Avon.

No further details are therefore provided in the SEA for the potential environmental impacts of options in ODU 8.

# SMZ 2 – ODU 9: Stanpit options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1), approximately every 25 years; construct armoured embankment around Stanpit historic landfill in epoch 2.
4. **Sustain A**: construct a new setback defence adjacent to the River Avon in the north part of the unit (epoch 2); construct new defence around Stanpit historic landfill (epoch 2); raise height of the defences over time to keep pace with SLR (epoch 3); aim to restore/ improve condition of the saltmarsh in front of the defences (epoch 1-3).
5. **Improve A**: as per Sustain A, except the defences are constructed to their full length and height when constructed; aim to restore/ improve condition of the saltmarsh in front of the defences (epochs 1-3).
6. **Adaptation / Resilience**: implement property level protection to the properties at risk from flooding throughout the appraisal period and maintain existing defences.

## Assessment findings

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** |
| Biodiversity and geodiversity | ? | ? | 0 | ++ | ++ | 0 |
| Climate change | -- | -- | - | ++ | ++ | - |
| Landscape | ? | ? | ? | - | - | ? |
| Historic environment | -- | -- | - | + | + | - |
| Land, soil and water resources | -- | -- | + | ++ | ++ | + |
| Population and communities | -- | -- | - | ++ | ++ | - |
| Transport and movement | -- | -- | - | ++ | ++ | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

## Leading option selection

Two Leading Options were selected for ODU 9 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Sustain A.

- Backup Option: Adaptation / Resilience.

Delivery of the National Economic Option (Sustain A) is likely to lead to environmental benefits across most categories as indicated by the SEA. However, funding is uncertain and if funding cannot be achieved the Backup Option (Adaptation / Resilience) would be delivered. For the Sustain A option there are significant potential positive benefits to biodiversity through saltmarsh restoration / enhancement which would provide BNG and would help the saltmarsh habitat adjust to sea level rise and climate change.

# SMZ 2 – ODU 10: Mudeford options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Improve A**: initially provide property level protection measures to the properties at risk and maintain the existing quay walls (epoch 1); then in epoch 2 or 3, construct a new frontline quay wall with a raised front wall along the length of the unit and along the banks of the River Mude and Bure Brook; investigate opportunities for saltmarsh restoration in front of defences (epochs 1-3).
5. **Improve B**: initially provide property level protection measures to the properties at risk and maintain the existing quay walls (epoch 1); then in epoch 2 or 3, construct a new frontline quay wall with a raised front wall along the east part of the unit and along the River Mude and Bure Brook; in epoch 2 or 3, construct a new setback wall along the west part of the unit whilst maintaining the existing quay wall in front; investigate opportunities for saltmarsh restoration in front of defences.
6. **Adaptation**: provide property level protection measures to the properties at risk and maintain the existing quay wall (epochs 1-3).

## Assessment findings

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** |
| Biodiversity and geodiversity | ? | ? | 0 | ++ | ++ | 0 |
| Climate change | -- | -- | -- | ++ | ++ | - |
| Landscape | ? | ? | ? | - | - | ? |
| Historic environment | -- | -- | -- | ++ | ++ | - |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | -- | ++ | ++ | - |
| Transport and movement | -- | -- | -- | ++ | ++ | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

## Leading option selection

Two Leading Options were selected for ODU 10 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve A.
- Backup Option: Adaptation / Resilience.

Delivery of the National Economic Option (Improve A) is likely to lead to environmental benefits across most categories as indicated by the SEA. However, funding is uncertain and if funding cannot be achieved the Backup Option (Adaptation / Resilience) would be delivered. For the Improve A option there are significant potential positive benefits to biodiversity through saltmarsh restoration / enhancement which would provide BNG.

# SMZ 2 – ODU 11: Mudeford Quay options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (epoch 1).
4. **Sustain A**: upgraded floodwall around properties at western end of the Quay in epoch 1 or 2; raise over time to keep pace with SLR (epochs 2 and 3); maintain/ refurbish the existing frontline structures around the Quay as required (epochs 1-3).
5. **Sustain B**: as per Sustain A, except also construct new setback wall in northern part of unit (epochs 1 and 2), between green area and road.
6. **Improve A**: as per Sustain A, except the defence is constructed to its full length and height initially (e.g. no new construction after epoch 1 or 2).
7. **Improve B**: as per Sustain B, except the defence is constructed to its full length and height initially (e.g. no new construction after epoch 1 or 2).
8. **Adaptation/ Resilience**: Maintaining the existing quay walls as per the Maintain Option but also implement property level protection to properties at risk of flooding in the unit.

## Assessment findings

| | Option number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Biodiversity and geodiversity | ? | ? | 0 | 0 | 0 | 0 | 0 | 0 |
| Climate change | -- | -- | - | + | ++ | + | ++ | - |
| Landscape | -- | -- | - | + | ++ | + | ++ | - |
| Historic environment | -- | -- | - | + | ++ | + | ++ | - |
| Land, soil and water resources | -- | -- | + | ++ | ++ | ++ | ++ | + |
| Population and communities | -- | -- | - | + | ++ | + | ++ | - |
| Transport and movement | -- | -- | - | - | 0 | - | 0 | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading option selection

Two Leading Options were selected for ODU 11 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Do Minimum.
- Local Aspirational Option: Adaptation / Resilience.

Delivery of the Local Aspirational Option (Adaptation / Resilience) is likely to lead to negative environmental impacts across most categories as indicated by the SEA. However, the magnitude of impacts are likely to be much less than the Do Minimum option. In this unit funding for new coastal management is likely to be very limited and there is limited economic case to do more than Adaptation / Resilience.

# SMZ 3 – ODU 12: Avon Beach and Friars Cliff options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Improve A**: refurbish existing defences once they reach the end of their design life (epoch 1) then undertake a beach nourishment scheme in epoch 2 alongside new groynes to help retain the beach material; locally raise seawall at Avon beach to ensure new beach volume can be retained; property level protection in epoch 3 to manage local risk at Mudeford Road.
5. **Improve B**: construct new larger linear defences along the length of the unit to provide the primary defence against flooding and erosion (note no beach nourishment with this option).
6. **Improve C**: this option is similar to Improve A but would also include public realm enhancements such as promenade raising to make the area more compatible with higher sea levels in the future.

## Assessment findings

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 |
| Biodiversity and geodiversity | ++ | ++ | 0 | 0 | 0 | 0 |
| Climate change | -- | -- | - | ++ | ++ | ++ |
| Landscape | -- | -- | - | + | - | ++ |
| Historic environment | -- | -- | - | ++ | ++ | ++ |
| Land, soil and water resources | -- | -- | + | ++ | ++ | ++ |
| Population and communities | -- | -- | - | ++ | + | ++ |
| Transport and movement | -- | -- | - | ++ | ++ | ++ |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

## Leading option selection

Three Leading Options were selected for ODU 12 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve A.

- Local Aspirational Option: Improve C.
- Backup Option: ‘Scaled back’ Improve.

Delivery of either of the Leading Options in this unit is likely to lead to major positive impacts across a range of environmental categories. Opportunities for BNG should be explored during further appraisal / design. New groynes in this location as part of these option present an opportunity to create intertidal habitat areas / pools to support ecology and there could also be opportunities to use biodiversity promoting materials and features as part of any refurbishments to the existing seawall defences.

# SMZ 3 – ODU 13: Highcliffe options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1); risk of outflanking current defences with this option.
4. **Improve A**: refurbishment of existing defences (from epoch 1) and undertake ongoing beach recycling (epoch 1); in epoch 2/ 3, undertake beach nourishment scheme as well as upgrading the rock groynes to help retain more beach material; during epoch 1, construct outflanking defences (e.g. rock revetment) to the east of the existing defences to prevent outflanking at Naish cliff.
5. **Improve B**: refurbishment of existing defences (from epoch 1) and undertake ongoing beach recycling (epoch 1); in epoch 2/3, construct a new rock revetment along the full length of the frontage; during epoch 1, construct outflanking defences (e.g. rock revetment) to the east of the existing defences to prevent outflanking at Naish cliff.
6. **Improve C:** same approach as Improve A except the beach nourishment intervention would be undertaken later on in the appraisal period.
7. **Managed Realignment A**: reduce length of groynes in the east part of the unit to allow more beach material to bypass the groynes and reach Naish cliff to the east (epoch 1); otherwise implement Improve A.
8. **Managed Realignment B**: reduce length of groynes in the east part of the unit and construct nearshore breakwaters to encourage continuous beach between Highcliffe and Naish cliff and facilitate improved sediment transport to the east (epoch 1).

## Assessment findings

| | Option number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Biodiversity and geodiversity | ++ | ++ | 0 | 0 | 0 | 0 | + | 0 |
| Climate change | -- | -- | - | ++ | ++ | ++ | ++ | ++ |
| Landscape | -- | -- | - | ++ | - | ++ | - | - |
| Historic environment | -- | -- | - | ++ | ++ | ++ | ++ | ++ |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | ++ | + | ++ | + | + |
| Transport and movement | -- | -- | - | ++ | ++ | ++ | ++ | ++ |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading option selection

Three Leading Options were selected for ODU 13 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve C.
- Local Aspirational Option: Improve A.
- Backup Option: 'Scaled back' Improve.

Delivery of either of the Leading Options in this unit is likely to lead to major positive impacts across a range of environmental categories. Opportunities for BNG should be explored during further appraisal / design. Refurbishing / upgrading the rock defences in this location as part of this option present an opportunity to create intertidal habitat areas / pools to support ecology and biodiversity.

# SMZ 4 – ODU 14: Naish Cliff and Barton on Sea options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1); significant amounts of cliff recession are expected to occur with this option due to groundwater/ land sliding and also due to toe defences being less effective with SLR.
4. **Improve A**: refurbishment of existing defences in first 10 years and repeated as required thereafter; large scale beach nourishment scheme along full length of unit in epoch 1; construct cliff drainage along full length of unit in epoch 1.
5. **Improve B**: new rock defences along full length of the unit at the toe of the cliff as well as cliff drainage along the full length of the unit (epoch 1).
6. **Managed Realignment A**: beach nourishment scheme at the beach at Naish cliff in epoch 1; construct new / upgrade rock revetment and refurbish rock groynes between Marine Drive West to the Eastern end of the unit (epoch 1); install new cliff drainage from Marine Drive West to the east in epoch 1 (note the eastern 1km of the unit does not need new drainage as it is functioning well); no new drainage at Naish cliff.
7. **Managed Realignment B**: as per Managed Realignment A, but the capital initial intervention would not be undertaken until epoch 2.
8. **Managed Realignment C**: beach nourishment scheme at Naish cliff in epoch 1; construct new / upgrade rock revetment and rock groynes to the currently defended part of the frontage (epoch 1); install new cliff drainage to the currently defended part of the frontage in epoch 1 (note the eastern 1km of the unit does not need new drainage as it is functioning well); no new defences/ drainage at Marine Drive West.
9. **Managed Realignment D**: as per Managed Realignment C, but the capital initial intervention would not be undertaken until epoch 2.
10. **Managed Realignment E**: beach nourishment scheme at Naish cliff in epoch 1; construct new / upgrade rock revetment and rock groynes in the east part of the unit (Marine Drive East) (epoch 1); install new cliff drainage to the currently defended part of the frontage in epoch 1 (note the eastern 1km of the unit does not need new drainage as it is functioning well); no new defences/ drainage at Marine Drive West.
11. **Managed Realignment F**: as per Managed Realignment E, but the capital initial intervention would not be undertaken until epoch 2.

# Assessment findings

| SEA topic | Option number 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Biodiversity and geodiversity | ++ | ++ | + | -- | -- | 0 | 0 | + | + | ++ | ++ |
| Climate change | -- | -- | - | ++ | ++ | ++ | ++ | + | + | - | - |
| Landscape | -- | -- | - | ++ | - | ++ | ++ | + | + | - | - |
| Historic environment | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | ++ | + | ++ | ++ | + | + | - | - |
| Transport and movement | -- | -- | - | ++ | ++ | ++ | ++ | + | + | - | - |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading option selection

Multiple Leading Options were selected for ODU 14 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Managed Realignment A.
- Backup Options: Managed Realignment B, Managed Realignment D, Maintain.

Delivery of the National Economic Option in this unit is likely to lead to major positive significant effects across most SEA topics. However, funding for this option is uncertain, and if funding cannot be found, then a choice of the Backup Options may be delivered instead. Managed Realignment B is expected to have similar positive effects, whilst Managed Realignment D and Maintain do not deliver the same level of positive environmental effects. Maintain has negative effects noted for most SEA topics.

# SMZ 5 – ODU 15: Barton on Sea to Hordle Cliff options assessment

## Strategic options

1. **Option 1 (Do Nothing)**: no new defences or maintenance; cliff erosion would continue/ increase in the future due to SLR.
2. **Option 2 (Do Minimum**): small scale patch repair maintenance to existing defences around outfall (localised health and safety issues, would not provide FCERM benefit).
3. **Option 3 (Managed Realignment**): undertake beach management (beach recycling) (epochs 1-3) to help control rates of cliff erosion (would not be stopped but could be somewhat controlled by providing uniform beach profile/ topping up areas where erosion is happening more rapidly).

## Assessment findings

| | Option number | | |
|---|---|---|---|
| SEA topic | 1 | 2 | 3 |
| Biodiversity and geodiversity | ++ | ++ | + |
| Climate change | - | - | - |
| Landscape | - | - | - |
| Historic environment | ? | ? | ? |
| Land, soil and water resources | 0 | 0 | 0 |
| Population and communities | - | - | - |
| Transport and movement | - | - | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

## Leading option selection

One Leading Option was selected for ODU 15 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Do Nothing.

Delivery of the National Economic Option (Do Nothing) is likely to lead to negative environmental impacts across a range of categories. However, there is no economic case in this unit to Do Something and therefore no viable alternatives exist. A positive of the Do Nothing option is that it could lead to improvements to the SSSI condition due to erosion of the cliff face in the future.

# SMZ 6 – ODU 16: Cliff Road options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences. Ensure health and safety compliance when defences fail.
2. **Do Minimu**m: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintai**n: refurbishment of existing defences (from epoch 1).
4. **Improve** A: new rock revetment along the full length of the unit to defend the cliff toe (epoch 1).
5. **Managed Realignment** A: beach nourishment to the full frontage in epoch 1; construct new rock strong point (e.g. rock revetment) at junction of Whitby Road and Cliff Road at the same time (epoch 1).
6. **Managed Realignment** B: as per Managed Realignment A, but construction of strong point delayed until start of epoch 2 (cliff may erode in the interim).
7. **Managed Realignment** C: as per Managed Realignment A, but construction of strong point delayed further until mid-way through epoch 2 (cliff may erode in the interim).

## Assessment findings

| | Option number | | | | | | |
|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Biodiversity and geodiversity | ++ | ++ | + | 0 | + | + | + |
| Climate change | -- | -- | - | ++ | + | + | + |
| Landscape | -- | -- | - | - | + | + | + |
| Historic environment | ? | ? | ? | ? | ? | ? | ? |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | + | + | + | + |
| Transport and movement | -- | -- | - | ++ | - | - | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

## Leading option selection

Multiple Leading Options were selected for ODU 16 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Managed Realignment C.
- Local Aspirational Option: Managed Realignment A/B.

- Backup Option: Maintain.

Delivery of either of the National Economic or Local Aspirational Options in this unit is likely to lead to positive impacts across most environmental categories. However, funding for these options is uncertain and if funding cannot be found then the Backup option (Maintain) may be delivered instead. This option does not deliver the same level of positive environmental impacts with negative impacts noted in most categories. With the Managed Realignment options, with the construction of a local strong point, there is potential to explore BNG opportunities. For example, if a rock structure is used opportunities for habitat creation could be explored during further appraisal / design work.

# SMZ 6 – ODU 17: Rook Cliff options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences. Ensure health and safety compliance when defences fail.
2. **Do Minimu**m: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintai**n: refurbishment of existing defences (from epoch 1).
4. **Improve** A: in epoch 1 refurbish / upgrade existing rock revetment, upgraded groynes (epoch 1).
5. **Improve** B: same approach as Improve A, except initial upgrades to defences delayed until the start of epoch 2.
6. **Improve** C: same approach as Improve A, except initial upgrades to defences delayed further until approximately mid-point of epoch 2.
7. **Managed Realignment** A: upgrade rock revetments at Rook Cliff and the White house, then removing the defences in between once failed and letting land realign / erode over time; manage rate of erosion in undefended area with beach nourishment and construction of rock groynes in realigned area to help retain material (from epoch 1).
8. **Managed Realignment** B: construct nearshore breakwaters and undertaken beach nourishment to help retain beach material in this location and control rates of erosion.

## Assessment findings

| | Option number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Biodiversity and geodiversity | ++ | ++ | + | 0 | 0 | 0 | + | 0 |
| Climate change | -- | -- | ? | ++ | ++ | ++ | ++ | ++ |
| Landscape | -- | -- | ? | ++ | ++ | ++ | - | - |
| Historic environment | -- | -- | ? | + | + | + | + | + |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | ++ | ++ | ++ | - | ++ |
| Transport and movement | -- | -- | ? | ++ | ++ | ++ | ++ | ++ |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading option selection

Multiple Leading Options were selected for ODU 17 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve C.
- Local Aspirational Option: Improve A/B.
- Backup Option: Maintain.

Delivery of either of the National Economic or Local Aspirational Options in this unit is likely to lead to significant positive effects across most SEA topics. However, funding for these options is uncertain, and if funding cannot be found, then the Backup option (Maintain) may be delivered instead. The impacts with the Maintain option are more uncertain, as it is unclear how the existing defences will perform in the future. With the Improve options, there is potential to explore BNG opportunities during further appraisal / design.

# SMZ 6 – ODU 18: Milford on Sea Frontage options assessment

## Strategic options

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimu**m: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintai**n: refurbishment of existing defences (from epoch 1).
4. **Improve** A: beach nourishment in first part of epoch 1, as well as refurbishment / upgrade of existing seawall and new groynes (also epoch 1); new setback defences (e.g. floodwall or embankment) and property level protection in the east part of the unit in epoch 2 to manage flood risk.
5. **Improve** B: same approach as Improve A except the initial nourishment and defence improvements would be undertaken in epoch 2.
6. **Managed Realignment** A: rock revetment at east end of frontage (root of Hurst Spit) in first few years (epoch 1); allow existing seawall to fail and allow erosion into area of open space behind, creating more space for wider beach; construct new defence alignment in epoch 2 once desired shoreline position reached; use beach nourishment to control rate of erosion (epochs 1-3); new setback defences (e.g. floodwall or embankment) and property level protection in the east part of the unit in epoch 2 to manage flood risk.
7. **Managed Realignment** B: construct nearshore breakwaters and undertaken beach nourishment to help retain beach material in this location and control rates of erosion.

## Assessment findings

| | Option number | | | | | | |
|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Biodiversity and geodiversity | -- | -- | ? | + | + | + | + |
| Climate change | -- | -- | ? | ++ | ++ | ++ | ++ |
| Landscape | -- | -- | ? | + | + | - | - |
| Historic environment | ? | ? | ? | ? | ? | ? | ? |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | ++ | ++ | - | ++ |
| Transport and movement | -- | -- | - | ++ | ++ | - | ++ |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

# Leading option selection

Multiple Leading Options were selected for ODU 18 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve A.
- Backup Options: Improve B and Maintain.

Delivery of the National Economic Option in this unit is likely to lead to positive significant effects across most SEA topics. However, funding for this option is uncertain, and if funding cannot be found, then a Backup option Improve B or Maintain may be delivered instead. The impacts of Improve B are similar to Improve A. The impacts with the Maintain option are more uncertain, as it is unclear how the existing defences will perform in the future. The Improve options will benefit the biodiversity and geodiversity SEA topic by helping to preserve the designated sites in the area, and there is potential to explore BNG opportunities during further appraisal / design.

# 1. Introduction

## 1.1 Background

AECOM has been commissioned by Bournemouth, Christchurch and Poole (BCP) Council to undertake a Strategic Environmental Assessment (SEA) in support of the emerging Flood and Coastal Erosion Risk Management (FCERM) Strategy for the coastal frontage at Christchurch Bay & Harbour (herein referred to as 'the Strategy').

The Strategy is being developed collaboratively by AECOM and the Project Team, which consists of officers of BCP Council, New Forest District Council (NFDC) and the Environment Agency (EA).

The Strategy extent is the coastal frontage between Hengistbury Head (immediately to the east of Hengistbury Head long groyne) and the landward (western) end of Hurst Spit. Within Christchurch Harbour, the Strategy extent is up to Tuckton Bridge on the River Stour and Knapp Mill on the River Avon (see Figure 1.1 below).


### Figure 1.1 Map of the Strategy area

Figure 1.2 overleaf provides a summary of the Strategy development process. The SEA process will inform the Strategy, through identification of the likely significant effects of the Short List Options, and any reasonable alternatives, on relevant environmental receptors.

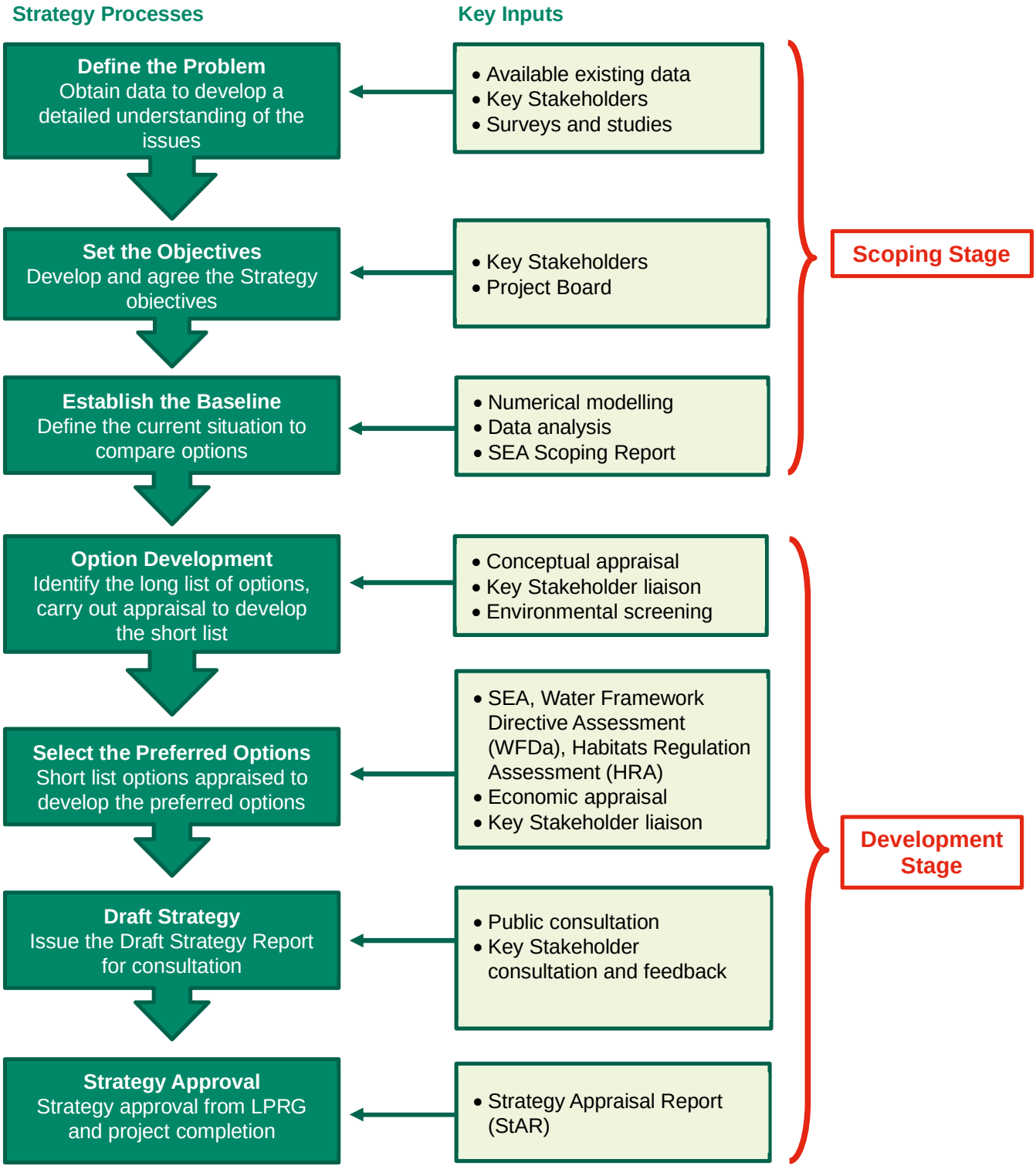


**Figure 1.2 Summary of the Christchurch Bay & Harbour FCERM Strategy development process**

## 1.2 Strategic Environmental Assessment

SEA is a mechanism for considering and communicating the likely significant effects of an emerging plan, and reasonable alternatives in terms of key environmental issues. The aim of a SEA is to inform and influence the plan-making process with a view to avoiding or mitigating negative environmental effects and maximising positive effects.

The Environmental Assessment of Plans and Programmes Regulations 2004 (otherwise known as the SEA Regulations) (SI 1633, 2004) require an environmental assessment to be carried out on certain plans and programmes that are likely to have a significant effect upon the environment. Applying the SEA process to flood management plans, including any plan for medium to long-term river or coastal management, is not legally required. However, adopting the SEA approach is strongly encouraged by the Department for Environment, Food and Rural Affairs (DEFRA) to allow a strategic approach to managing the coast. As a result, a full SEA process is being carried out as part of the Christchurch Bay and Harbour FCERM Strategy which satisfies the requirements of the SEA Regulations.

In addition to the SEA, a separate Habitats Regulations Assessment, Marine Conservation Zone Assessment and Water Framework Directive Assessment have/are being undertaken to support the development of the Strategy.

## 1.3 Structure of this Environmental Report

This report, which follows the Scoping Report completed in December 2021, is the Environmental Report for the Strategy and will be published alongside it.

This report begins by introducing the Strategy, then it outlines the scope of the SEA. It then sets out what plan making/ SEA has involved to this point, followed by the methodology for the assessment of the alternative strategic options within each Option Development Units (ODUs), as well as the assessment itself. Finally, next steps are highlighted.

# 2. What is the Strategy seeking to achieve?

## 2.1 Introduction to the Strategy

The aim of this Strategy is to provide an integrated plan for the Christchurch Bay & Harbour frontage, delivering sustainable and long-term management for coastal flood and erosion risks over the next 100 years. The Strategy will further develop the existing SMP policies adopted in 2011 and update the information provided in the 2012 Christchurch Bay & Harbour FCERM Study, using the most up-to-date data and guidance.

The Strategy will provide an assessment of the risks and opportunities associated with coastal processes and develop a management framework to manage these risks, as well as any opportunities, in a sustainable manner. This will form an important element of the policy for flood and coastal defences and provide guidance for spatial planning within the coastal zone. The Strategy will determine the leading options for flood and coastal defences through multi-variate appraisal including a cost-benefit analysis.

# 3. What is the scope of the SEA?

## 3.1 Introduction

SEA scoping was undertaken prior to the development of the SEA. The scoping report (AECOM, 2023) can be found in Appendix A.

The aim of this section of the report is to provide a high level introduction to the SEA scoping, i.e., the sustainability topics and objectives that should be a focus of the assessment of the plan and reasonable alternatives. More detailed information, including the policy review and baseline information that has supported the development of key sustainability issues and objectives is presented in the SEA Scoping Report (Appendix A).

### 3.1.1 Consultation

The SEA Regulations require that "when deciding on the scope and level of detail of the information that must be included in the report, the responsible authority shall consult the consultation bodies". In England, the consultation bodies are the Environment Agency, Historic England, and Natural England[1]. The SEA scoping report was consulted on with these organisations in December 2021. Feedback was provided and updates to the scoping report were made. Further feedback on the scoping stage was provided during the consultation of the SEA in summer 2023 and therefore the Scoping Report was further updated to reflect these latest comments from the consultation bodies (see Appendix A for the latest version of the Scoping Report).

### 3.1.2 Key sustainability issues

The key sustainability issues for the Strategy area, identified through scoping, are presented below under each SEA topic.

#### Air quality

- There are no AQMAs in the Strategy area, or areas known to exceed national objectives for air quality. The main pollutant of concern in the Strategy area is nitrogen dioxide, largely related to emissions from vehicles due to traffic and congestion. Though traffic and congestion have the potential to increase vehicle emissions and reduce air quality.

#### Biodiversity and geodiversity

- 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. This includes geological conservation sites along significant lengths of the cliff frontage, highlighting the Strategy area's rich geological and paleoenvironmental resource. The condition and integrity of the key features within these sites for which they are designated should not be compromised, and efforts should be made to enhance these sites through habitat restoration and re-connection where possible. There are a wide variety of habitats in the Strategy area, particularly in Christchurch Harbour, including mudflats, saltmarsh and sand dunes which support diverse plant and animal communities.
- Coastal defences and development must avoid disruption to coastal processes where it could lead to the loss of important coastal habitats (e.g. through defence footprint encroachment), including those identified which support rare and scarce species. Many of these sites have great ornithological importance, supporting large breeding and over-wintering populations of wildfowl and other birds and preservation of their habitats is important.
- There are a number of management policies, plans and strategies which aim to protect and enhance the biodiversity and geodiversity of Christchurch Bay & Harbour (please refer to the SEA scoping report for full details, AECOM 2022). The implementation of the Strategy would offer further

[1] These consultation bodies were selected "by reason of their specific environmental responsibilities, [they] are likely to be concerned by the environmental effects of implementing plans and programmes" (SEA Directive, Article 6(3)).

opportunities for the protection of designated sites and prevent their inundation and erosion, complimenting the coastal defence measures which are already in place.

- In addition, new defences provide the opportunity to lead to Biodiversity Net Gain (BNG) and potential opportunities for this have been highlighted in this report.

## Climate change

- The IPCC report highlights the urgency to act on climate change now in order to limit the impacts of rising global temperatures as much as possible. If levels of $CO_2$, and other greenhouse gas emissions, continue to rise then the increase in temperatures could become irreversible.
- $CO_2$ emissions per capita are slightly higher than the average for England in the NFDC area, and slightly lower in the BCP Council area; both have followed the national trend of reducing $CO_2$ emissions since 2005.
- The Strategy area predominantly falls within Flood Zone 1, although there are stretches of Flood Zone 2 and 3 at the coast and running along the Rivers Avon and Stour. Climate change is predicted to lead to an increase in sea levels, temperatures and precipitation, as well as more frequent storm surges and high tides causing more extreme weather events and leading to more widespread fluvial and tidal flooding. Increased precipitation could also lead to increased surface water flooding throughout the Strategy area. Implementing new coastal defences, nature-based solutions and sustainable drainage systems (SuDS) could mitigate some of the impacts of climate change. This could also lead to increased rates of coastal erosion, impacting beach levels and the stability of the soft cliffs.

## Landscape

- Whilst there are no designated landscape sites within the Strategy area, the area is recognised for its special landscape setting. Several locations along the Bay provide nature conservation and recreation, with Christchurch Harbour providing a strong sense of place, combining historic elements with the maritime setting.
- Future development could reduce the landscape quality, however the policies and strategies in place aim to protect and enhance the landscape character and the quality of the coastal environment.
- Increased climate change is likely to lead to further coastal flooding and erosion, which will particularly impact the cliffs located along Christchurch Bay, and the recreational development along the coastline.

## Historic environment

- European, national and local policies and strategies seek to protect and enhance the historic environment within the Strategy area. Although some heritage assets feature on the Heritage at Risk Register, they are not at risk for reasons pertaining to flood risk management. There are some other heritage assets within the Strategy area which are located in areas of flooding and coastal erosion risk. Buried archaeological resources could also be at risk in the future, through the loss of land by erosion, inundation, or the construction of new coastal defences. Consideration is also given to the marine historic environment, including Marine Conservation Zones and Protected Wreck Sites.
- It is important that these assets are protected and enhanced where possible to maintain their integrity and importance. There are potential future pressures in coastal squeeze climate change and development, though it is likely that the Strategy can contribute to reducing some of these pressures through reduced flooding and erosion impacts to the assets and improved management of the coastal zone.

## Land, soil and water resources

- Christchurch Harbour is predominantly low topography, in comparison to the cliff sections along Christchurch Bay. Historic erosion rates suggest retreat of these cliffs and beaches in the future, which could impact land and soil resources. Although there is little agricultural land in Christchurch Harbour, there is agricultural land of varying quality further along the bay towards New Milton and Milford-on-Sea.

- The principal watercourses in the Strategy area are the River Avon and the River Stour, and there are several tributaries throughout the Strategy area (Becton Bunny at Barton-on-Sea, the Walkford Brook and Danes Stream). Fishing is a popular activity in the Strategy area, both commercial and recreational, particularly at Christchurch Harbour, the River Stour and the River Avon.
- The Water Resource Management Plan has not identified pressure on the supply-demand balance in the Strategy area in the next 25 years, with a small (<3%) supply-demand deficit only identified in 2045 for non-household demand. Water quality is monitored by three European Directives: the Water Framework Directive, Urban Waste Water Treatment Directive and the European Bathing Water Directive. All of the watercourses in the Strategy area have a WFD classification of 'good' or 'moderate' for ecological status but fail in terms of their chemical status. Christchurch Harbour is compliant with the Urban Waste Water Directive, and all bathing waters tested have a classification of excellent for 2019.
- A desktop study has identified potential areas of contaminated land, using the EA's historic landfill dataset, and the CIRIA Guidance C718 to define a framework to assess the risks to potential receptors. The receptors include people, properties, environmental designations and watercourses. Increased coastal flooding and erosion in the future is likely to present pathways for contamination to these receptors.

### Population and communities

- Christchurch Bay & Harbour is primarily comprised of residential communities, with tourism and recreation a large sector in the economy. There are five main communities which have developed from historic settlements: Bransgore, Christchurch, Highcliffe and Walkford, Milford-on-Sea and New Milton.
- There are a wide variety of recreational facilities in the Strategy area, which are vital to improving the health and wellbeing of the community including access to the natural coastal environment through beaches and coastal waters, activities such as fishing and water sports, nature conservation sites and historical buildings.
- These communities, and the people and properties within them, are at risk of coastal flooding and erosion in the future. The Strategy will improve the resilience of the community to these risks, through improved coastal management. In some areas, this will involve new coastal defences and improved access to the coast and open space. In other areas of the coast, the management may involve adaptation to the changing coastline through relocation of some popular sites.

### Transportation and movement

- Within the Strategy area, there is a network of smaller roads which connect to the wider area. There are good public transport infrastructure links within and outside of the Strategy area, including trains, harbour and ferry services.
- Public rights of way and cycleways also exist throughout Christchurch Bay and Harbour, with new cycle routes having recently been developed to support an increased uptake in cycling and sustainable transport methods.
- Although there is a risk of coastal flooding and erosion to the transportation and movement within the Strategy area, the implementation of the Strategy could protect key infrastructure as well as enhancing the existing travel networks and promoting use of more sustainable travel methods.

## 3.1.3 The SEA framework

The SEA scope is summarised in a list of topics, objectives, and assessment questions, known as the SEA framework. These draw on the key sustainability issues identified through scoping. **Table 3.2** below presents the SEA framework as broadly agreed in 2020.

Notably, in the absence of any specific air quality issues, and considering that the Strategy is not likely to significantly affect the air quality SEA topic in the future, this topic was scoped out for the purposes of the SEA process. Potential localised changes to air quality were noted during the scoping phase, arising from construction activities. However, during scoping this was considered not likely to lead to significant changes in the current air quality baseline.

## Table 3.2 SEA framework

| SEA topic | SEA objective | Assessment questions (will the proposal help to…) |
|---|---|---|
| Biodiversity and geodiversity | To protect and enhance biodiversity and geodiversity habitats and species; achieving biodiversity net gain and improved habitat connectivity within the Strategy area. | • Protect and enhance European, nationally and locally designated sites, including species that are important to the integrity of these sites and recognised as priority species?<br>• Protect, enhance and improve connectivity of habitats?<br>• Support the delivery of biodiversity net gain?<br>• Support habitat creation, restoration and recovery in the coastal zone?<br>• Increase the resilience of biodiversity in the Strategy area to the effects of climate change through increased coastal flooding and erosion? |
| Climate change | To support the resilience of the Strategy area to the potential effects of climate change, including coastal flooding and erosion. | • Contribute to adapting to climate change?<br>• Contribute to mitigating the main causes of climate change by promoting low or zero carbon approaches? |
| Landscape | To protect and enhance the character and quality of the Strategy area landscape and seascape. | • Conserve and enhance the quality of landscape/ seascape for people, places and nature?<br>• Contribute to better management of landscape/ seascape assets?<br>• Conserve and enhance features of local importance?<br>• Improve linkages to the coastline?<br>• Protect visual amenity? |
| Historic environment | To protect, conserve and enhance the historic environment within the Strategy area. | • Conserve and enhance heritage assets and their settings, considering the unique nature of heritage assets in the Strategy area and how they may be impacted by coastal defences?<br>• Conserve and enhance the special interest, character and appearance of locally important features and their settings?<br>• Consider the contribution of historic places to the character of the coastal environment?<br>• Support access to, interpretation and understanding of the historic environment and character of the Strategy area?<br>• Support the undertaking of early archaeological investigations and, where appropriate, recommend mitigation strategies? |
| Land, soil and water resources | To ensure the efficient and effective use of land in the Strategy area. | • Protect and conserve soils and improve resilience to degradation?<br>• Protect and conserve the best and most productive agricultural land?<br>• Prevent contamination from historic landfill sites and support remediation? |

| SEA topic | SEA objective | Assessment questions (will the proposal help to…) |
|---|---|---|
| | To protect and enhance water quality and manage water resources within the Strategy area in a sustainable manner. | • Help secure compliance with the Water Framework Directive and contribute to enhancing the status of water bodies?<br>• Contribute to the sustainable management of water resources and fisheries? |
| Population and communities | Protect and enhance the health and wellbeing of the community within the Strategy area. | • Protect and improve the resilience of communities?<br>• Improve and enhance the health and wellbeing of communities?<br>• Improve access to the coastal environment?<br>• Support the provision of more, better quality and accessible green infrastructure/ open space?<br>• Avoid negative impacts to the quality and/ or extent of existing recreational assets, including coastal footpaths? |
| Transport and movement | Protect and enhance transport infrastructure in the Strategy area. | • Protect and improve the resilience of key transport infrastructure?<br>• Extend or improve active travel networks?<br>• Enable sustainable transport infrastructure improvements? |

# 4. What has plan-making involved to this point?

## 4.1 Introduction

Work on the Strategy has been underway for some time and the aim here is not to provide a comprehensive explanation of all the work carried out to date. Rather the intention is to provide a high level explanation of the work undertaken to develop and appraise options.

More specifically, this part of the report introduces the Strategic Management Zones (SMZs) and the Option Development Units (ODUs) that have been developed for the Strategy frontage. It then goes on to explain how the options under each ODU were established.

## 4.2 Strategy Management Zones

The Strategy frontage consists of six Strategy Management Zones (SMZs), which are:

- **SMZ 1 (Mudeford Sandbank)** covers Hengistbury Head to the east of the Long Groyne and Mudeford Sandbank. Both the open coast and harbour sides of Mudeford Sandbank are included in this SMZ.
- **SMZ 2 (Christchurch Harbour)** covers the coastline around Christchurch Harbour, up to Knapp Mill on the River Avon and Tuckton Bridge on the River Stour.
- **SMZ 3 (Christchurch Beaches and Cliffs)** covers the Avon Beach and Highcliffe parts of the frontage.
- **SMZ 4 (Naish Cliff and Barton on Sea)** covers the area between Chewton Bunny to the eastern end of the Barton on Sea coastal defences.
- **SMZ 5 (Taddiford)** covers the area between Barton on Sea and Hordle Cliff. The west boundary of the unit is at the eastern end of the Barton on Sea defences and the east boundary is at West Road (western end of the Hordle beach huts).
- **SMZ 6 (Milford on Sea)** covers the 2.3km frontage between Hordle Cliff and the eastern end of Milford on Sea.

## 4.2.1 Option Development Units

Option Development Units (ODUs) have been developed for each SMZ, and these are set out below:

- SMZ 1 (Mudeford Sandbank) (shown in **Figure 4.1** below):
  - **ODU 1: Hengistbury Head East**
  - **ODU 2: Mudeford Sandbank**

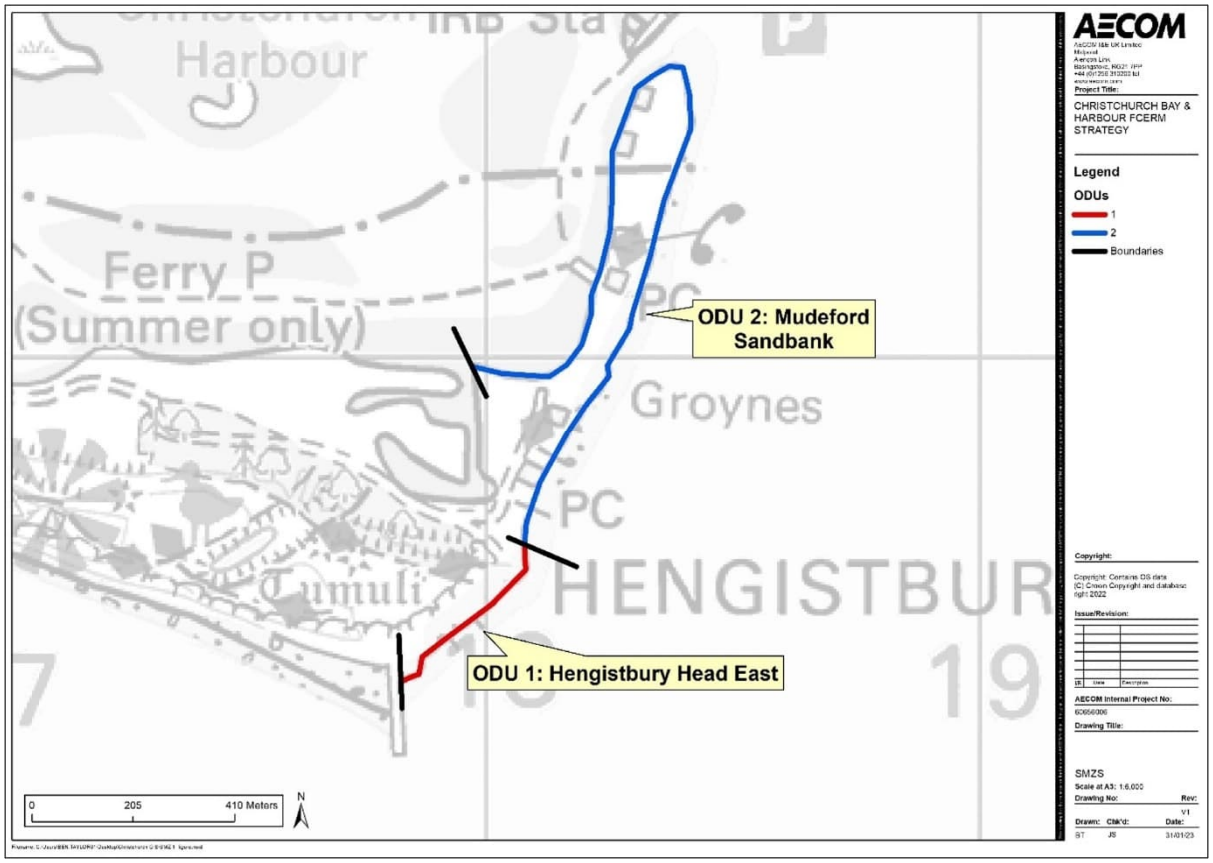


**Figure 4.1 Location of ODUs within SMZ 1**

- SMZ 2 (Christchurch Harbour) (shown in **Figure 4.2** below):
  - **ODU 3: Christchurch Harbour South**
  - **ODU 4: Wick**
  - **ODU 5: Willow Drive and the Quomps**
  - **ODU 6: River Avon West Bank**
  - **ODU 7: Rossiters Quay**
  - **ODU 8: River Avon East Bank**
  - **ODU 9: Stanpit**
  - **ODU 10: Mudeford**
  - **ODU 11: Mudeford Quay**

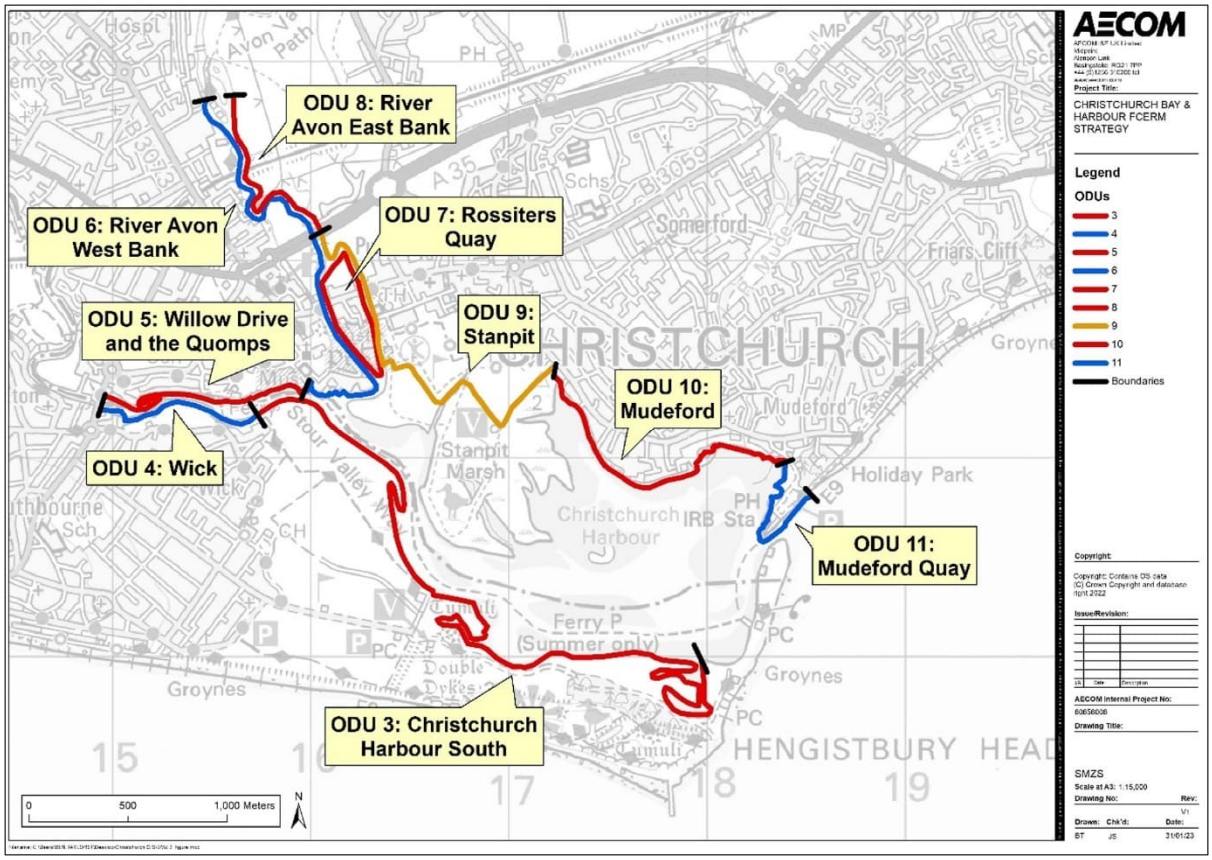


**Figure 4.2 Location of ODUs within SMZ 2**

- SMZ 3 (Christchurch Beaches and Cliffs) (shown in **Figure 4.3** below):
  - **ODU 12: Avon Beach and Friars Cliff**
  - **ODU 13: Highcliffe**

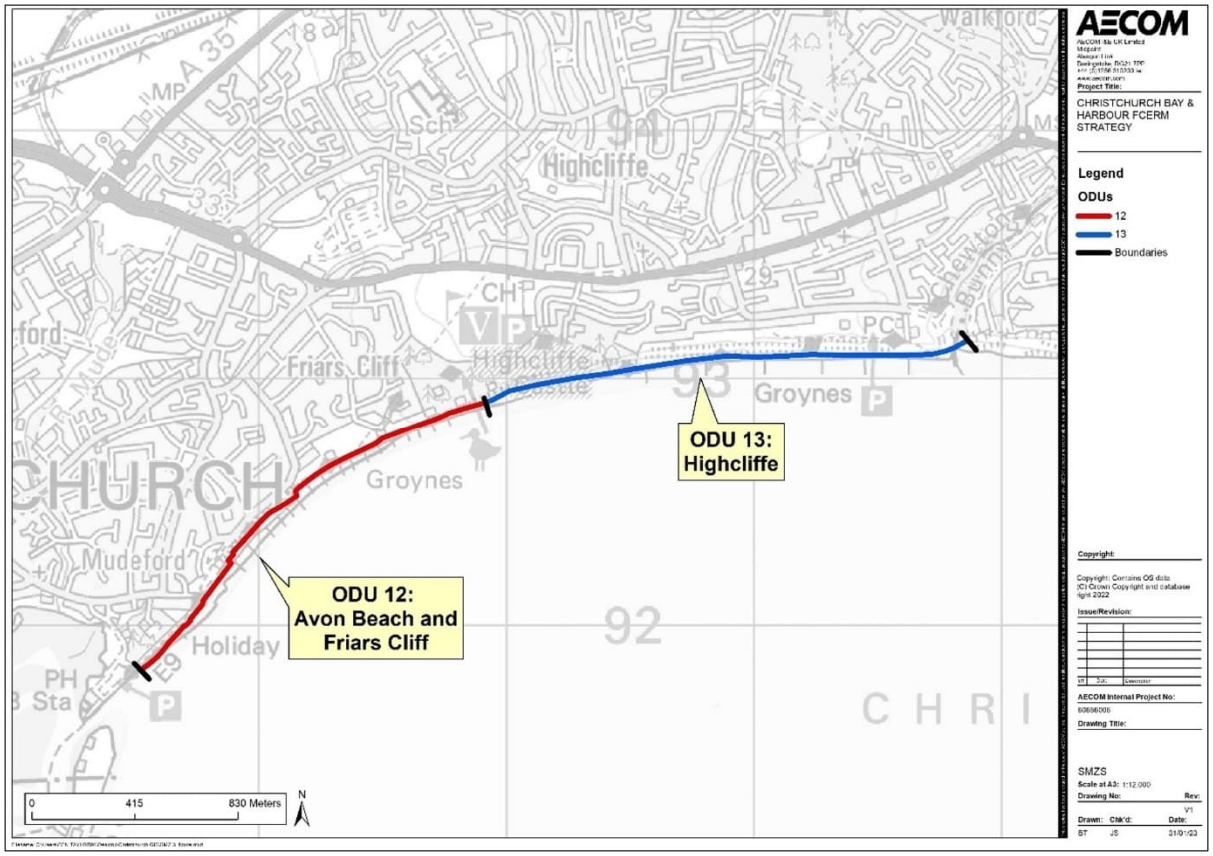


**Figure 4.3 Location of ODUs within SMZ 3**

- SMZ 4 (Naish Cliff and Barton on Sea) (shown in **Figure 4.4** below):
  - **ODU 14: Naish Cliff and Barton on Sea**


**Figure 4.4 Location of ODUs within SMZ 4**

- SMZ 5 (Taddiford) (shown in **Figure 4.5** below):
  - **ODU 15: Barton on Sea to Hordle Cliff**

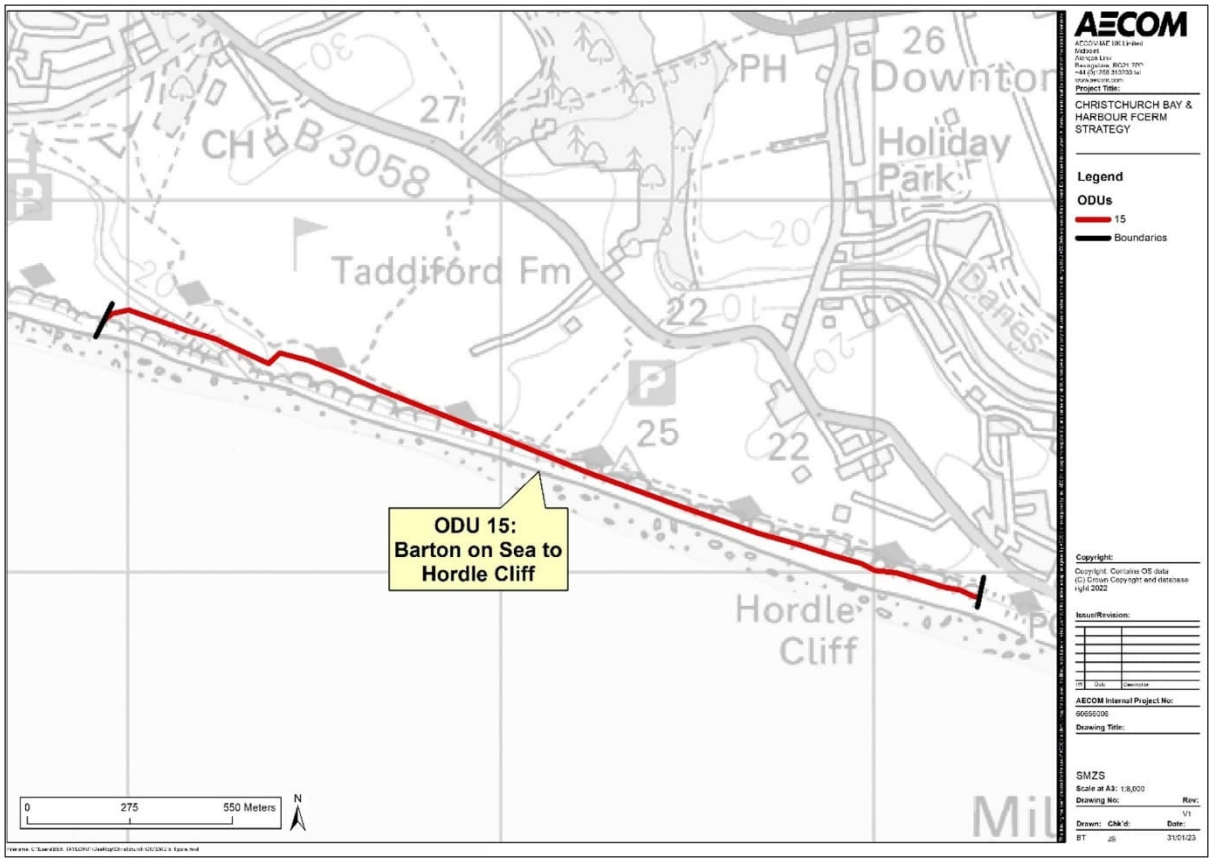


**Figure 4.5 Location of ODUs within SMZ 5**

- SMZ 6 (Milford on Sea) (shown in **Figure 4.6** below):
  - **ODU 16: Cliff Road**
  - **ODU 17: Rook Cliff**
  - **ODU 18: Milford on Sea Frontage**

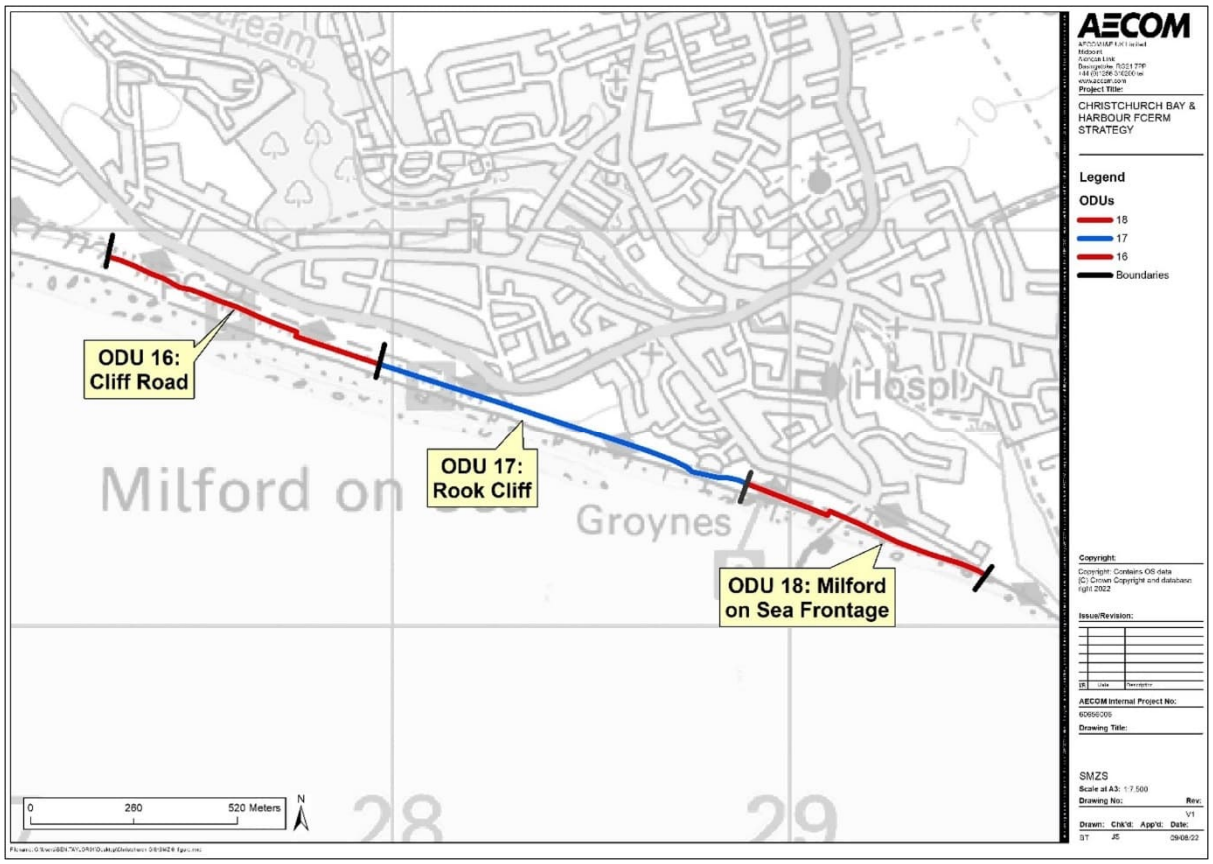


**Figure 4.6 Location of ODUs within SMZ 5**

# 4.3 Establishing ODU options

The Short List Options Report, undertaken by AECOM in November 2022, represents Stage 4 of the options appraisal for the Strategy, in which a draft short list of options is presented. The short list of options comprises a list of high-level strategic options for each SMZ, as well as the supporting appropriate local measures identified for implementing these strategic options in each ODU.

This was followed by Stage 5 of the options appraisal, where the draft short list of options was presented to the public and key stakeholders for review and feedback. This took place in March 2023. Updates to the short list of options were made to reflect key feedback. Further work was then undertaken to develop the short list of options in more detail (Stage 6) to inform the selection of the leading option(s) (Stage 7).

# 4.4 Selecting Leading Options

An economic, environmental, technical and social appraisal was undertaken to select the Leading Options from the short list. Full details of this can be found in the Leading Options report (AECOM, 2024). The findings from the SEA fed into the decision making criteria and formed the environmental appraisal element of the option appraisal process. Up to three types of Leading Option were selected in each ODU:

- The National Economic Leading Option: this is the Leading Option which is identified by following the Environment Agency's Flood and Coastal Erosion Risk Management Appraisal Guidance.
- The Local Aspirational Option: this option considers local opportunities, wants and needs to deliver wider benefits. This option typically costs more than the National Economic Leading Option.
- Backup Option: this option has been identified where there is a large funding shortfall. It is typically a lower cost option that will be more deliverable if funding is limited.

Delivery of the Strategy options will follow an adaptive pathway approach whereby the delivery of schemes are made subject to changing risk profiles (i.e. rates of climate change) and funding availability. This provides flexibility to the delivery team to adapt to changes in circumstances and move between the Leading Options as required over the course of the Strategy delivery. Prior to any schemes being undertaken, the coastal authorities will engage with key stakeholders, such as Natural England and Historic England, and more fully assess the environmental impacts at the local level. It is recognised that the coastal processes are complex in Christchurch Bay, and the area contains a number of internationally and nationally designated sites and features. Early discussions with the key stakeholders prior to scheme delivery will aid the authorities in helping to refine options and provide appropriate mitigation if it is required.

# 5. SEA methodology

## 5.1 Introduction

This chapter sets out the methodology for the strategic environmental assessment of the short list options in each ODUs.

## 5.2 Methodology

For each of the short list options, the assessment examines likely significant effects on the baseline, drawing on the sustainability topics and objectives identified through scoping (see **Table 3.2**) as a methodological framework. As shown below, '++' is used to indicate major positive significant effects, '+' to indicate minor positive significant effects, '-' to indicate minor negative significant effects, and '—' to indicate major negative significant effects. Where appropriate, neutral effects (indicated by '0') or uncertainty (indicated by '?') are noted. These effects will also be discussed in the text under each table.

In terms of establishing significant effects, major and minor significant effects (either positive or negative) are differentiated based on a range of factors including; the sensitivity of receptors (i.e. is the site internationally, nationally or locally designated and what condition is it currently in?), magnitude of effects (i.e. to what extent will there be a change in the baseline conditions?), timescale of effects (i.e. will the effects be short-term or long-term, temporary or permanent?), and the extent to which the effects are likely to occur in the absence of interventions (i.e. to what extent do interventions differ from the existing policy context). Meanwhile, neutral effects are predicted when there is likely to be no change in the baseline conditions, whilst uncertainty is noted where the significance of effects are difficult to predict. This could be due to dependency on external factors that are currently difficult to identify; or potential for effects to be both positive and negative.

Ultimately, a degree of professional judgement is used to determine significance, and this is highly dependent upon the interaction between the range of factors outlined above. However, effects are explained and justified throughout the appraisal text.

Every effort is made to predict effects accurately; however, where there is a need to rely on assumptions to reach a conclusion on a 'significant effect' this is made explicit in the assessment text.

Finally, it is important to note that effects are predicted considering the criteria presented within the Regulations.[2] So, for example, account is taken of the duration, frequency, and reversibility of effects.

It is noted that options will be refined in the future at the scheme stage, as the selected pathway is followed.

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

[2] Schedule 1 of the Environmental Assessment of Plans and Programmes Regulations 2004.

# 6. SMZ 1 – ODU 1: Hengistbury Head East options assessment

## 6.1 Introduction

ODU 1 (shown in **Figure 6.1** below) is 400m long and is located immediately to the east of Hengistbury Head Long Groyne. Hengistbury Head provides a stabilising influence on the shape of the wider bay by acting as an 'anchor point', with works planned for an upgrade of the long groyne in the immediate future. This will ensure it remains so for the next century. The erosion rate of the coastline in this unit is likely to have an impact on the position and integrity of Mudeford Sandbank (ODU 2).

There is currently rock armour and gabions providing protection to the toe of the cliffs, although these defences are in a poor condition with an estimated residual life of <10 years.

The Shoreline Management Plan (SMP)[3] policy for this unit is for 'Managed Realignment' of the cliff line.


**Figure 6.1 ODU 1**

## 6.2 Strategic Options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail. This could lead to significant erosion of the frontage in the future once defences fail.

[3] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required). This will extend the service life of the existing defences but over time it will become harder to maintain the structures and erosion may occur.
3. **Improve**: new rock revetment (from epoch 1) aiming to minimise any further erosion of the cliff top. A limited amount of erosion may occur due to natural cliff slope processes such as weathering.
4. **Managed Realignment**: refurbishment of existing defences from epoch 1 and ongoing beach recycling; this would not alter the geometry of the existing defences (e.g. footprint/ height of defences would remain the same as today). The intent would be to let the cliff erode in a controlled manner. Whilst the defences would provide protection to the cliff toe, other erosion processes such as weathering could still lead to recession of the cliff top over time.

Erosion of the cliff in ODU 1 is likely to occur with all four of the strategic options in this unit. The precise amount of erosion that would be expected to occur with the options is uncertain as it will depend on future cliff slope processes and rates of toe erosion from the sea which is difficult to predict. With any of the options the erosion should be monitored over time to ensure the options are being delivered as intended.

The Do Nothing option would be expected to lead to the largest amount of erosion in the future and estimated erosion zones for this approach can be found in the Shoreline Management Plan.

The Do Minimum option is the option with the next highest amount of expected erosion (but less than Do Nothing). In the short and medium term whilst the existing defences are maintained and functioning, this option would be expected to preserve the integrity of Hengistbury Head, ensuring the headland continues to provide a stabilising influence on the wider coastline and to provide shelter to Christchurch Harbour. However, during this time localised cliff top erosion of the headland itself could still occur due to continuing cliff slope processes such as weathering. In the long term once the existing defences are no longer functioning, there is more uncertainty around the evolution of the headland. A risk in the long term is for similar rates of erosion to Do Nothing to occur (although delayed) which could reduce the stabilising influence of the headland on the wider coastline, potentially increasing the exposure to storms within the harbour. However, this risk is difficult to quantify currently and more information would be needed through a coastal monitoring programme to assess how the risk evolves over time.

The Managed Realignment option would be expected to result in less erosion than the Do Nothing and Do Minimum options. Refurbishments of the defences will help to ensure the cliff toe remains defended throughout the appraisal period, which will reduce toe erosion. However, the standard of protection of the toe defences would reduce over time due to sea level rise, so some toe erosion could occur (albeit in a more controlled manner). This option would be expected to preserve the integrity of Hengistbury Head and it would continue to provide a stabilising influence on the coastline and provide shelter to Christchurch Harbour. However, localised / minor cliff top erosion on the headland itself could occur leading to damage to land based environmental designations in ODU 1.

The Improve Option would be expected to lead to the least amount of erosion of the options as this option would improve the standard of the defences at the toe of the cliff, ensuring the area has a robust defence into the future against sea level rise. Only minor localised erosion would be expected due to cliff slope processes such as weathering.

# 6.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 6.1** below and discussed in more detail underneath.

## Table 6.1 Assessment findings for ODU 1

| | Option number | | | |
|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** |
| Biodiversity and geodiversity | - | - | 0 | + |
| Climate change | -- | -- | + | ? |
| Landscape | -- | -- | - | + |
| Historic environment | -- | -- | - | - |
| Land, soil and water resources | 0 | 0 | 0 | 0 |
| Population and communities | - | - | + | + |
| Transport and movement | - | - | + | + |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

ODU 1 falls within units 1 (Friars Cliff), 2 (High Cliff) and 13 (designated due to geological interest) of the Christchurch Harbour SSSI[4].

The headland falls within unit 1 (Friars Cliff) of the SSSI. The main habitat here is dwarf scrub heath (lowland). The unit is currently in an unfavourable but recovering condition. This is a large unit containing dry and humid heath, acid grassland, maritime grassland, scrub and ponds. The heathland and acidic grassland remain favourable in most areas and generally the site is well managed. However, some areas are under-managed and have a high cover of gorse and other scrub, including bramble, broom, young oak trees and sallows.

The beach falls within unit 2 (High Cliff) of the SSSI. The main habitat here is supralittoral rock. The unit is currently in an unfavourable but recovering condition because scrub management has commenced and the unit has been grazed. Foredunes at the eastern end of the unit, at the tip of Hengistbury Head, contain dune species lyme grass, sea bindweed, sand sedge, and small populations of the Dorset Rare sea spurge and hare's-tail grass.

The cliff face falls within unit 13 of the SSSI, which was designated due to geological interest. Unlike the other two units, this unit is currently in a favourable condition. Geological interest is exposed along the entire south-facing cliff faces. However, the east-facing defended section, which is covered by ODU 1, has a higher cover of scrub.

The ODU also falls within the Hengistbury Head LNR[5], whilst the headland falls within the Dorset Heaths SAC[6] and Dorset Heathlands SPA. The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA. Concerning the SAC, the site primarily comprises heath, scrub, maquis and garrigue, and

[4] Natural England (no date): 'Christchurch Harbour SSSI', [online] available to access via this link
[5] Natural England (no date): 'Hengistbury Head LNR', [online] available to access via this link
[6] JNCC (no date): 'Dorset Heaths', [online] available to access via this link

phygrana (86%). The Annex I habitats that are a primary reason for selection of this site are: Northern Atlantic wet heaths with *Erica tetralix*, European dry heaths, and depressions on peat substrates of the *Rhynchosporion*.

In terms of BAP priority habitats, the headland largely comprises lowland heathland. However, there is an area of deciduous woodland near the eastern boundary of the ODU, and the cliff near the western boundary of the ODU comprises maritime cliff and slope. In addition, Natterjack toad – a European protected species – has been recorded in the ODU.

Flood risk in this location is isolated at the bottom of the cliff. Whilst there are no properties in the vicinity of this ODU, there are beach huts along the beach to the north of the eastern boundary of the ODU. There are no official public rights of way (ProWs) in this location. However, there are informal footpaths across the headland, which run close to the cliff face.

The ODU falls within the Dorset Heaths[7] National Character Area (NCA), which today contains some of the best lowland heath left in England. It is also recognised that Hengistbury Head provides a stabilising influence on the shape of the wider bay by acting as an 'anchor point' and is therefore key to determining the character of the landscape and seascape in this location.

With regards to the historic environment, the cliff and headland form part of the 'Multi-period landscape on Hengistbury Head' scheduled monument[8]. This was designated due to the extensive nature of the archaeological evidence in this location, which make it one of the best-known case studies in British archaeology. The monument comprises a multi-period landscape including settlement, ritual, funerary, agricultural, manufacturing, trading, quarrying and defence activity ranging from the Palaeolithic to the Victorian periods. Geologically, the promontory comprises easily eroded, low dipping Eocene sands and clays. Although the Head could still be at risk from extreme weather events, currently cliff erosion tends to be very limited because of the rock revetment at the base of the cliff, as well as the wide beach created by longshore drift from the beach replenishment schemes at Bournemouth and the Long Groyne.[9] In terms of non-designated heritage assets, there have also been significant occupation sites found around the headland, and whilst not protected by scheduling, these are still considered to be of national significance.

Option 1

Under Option 1 (Do Nothing), there will be no new defences or maintenance of existing defences. Due to this, the existing defences are likely to fail over time, resulting in increased coastal erosion. This could have major long-term negative significant effects across the climate change, landscape and historic environment SEA topics due to the potential loss of parts of Hengistbury Head.

This could also have knock-on effects for the wider bay, including Mudeford Sandbank (ODU 2) to the northeast. Regarding the historic environment SEA topic, this option has the potential to result in the large-scale loss of parts of 'Multi-period landscape on Hengistbury Head' scheduled monument, as well as the non-designated occupation sites found around the headland. There is also potential for impacts to the historic environment within Christchurch Harbour itself if the stabilising influence and shelter provided by the headland is impacted by erosion in the future.

However, only minor negative long-term significant effects are predicted under the population and communities and transport and movement SEA topics as there are no properties or essential transport infrastructure in the vicinity of the ODU. Still, this option could lead to the loss of beach huts just outside of the ODU, as well as the footpaths on the headland. With respect to biodiversity and geodiversity, Option 1 (Do Nothing) would likely lead to the erosion of parts of the Dorset Heathlands SPA and Dorset Heaths SAC, as well as the Christchurch Harbour SSSI. Due to this, minor negative long-term significant effects are also predicted under this SEA topic. Nevertheless, it is noted that whilst this option could lead to the loss of part of unit 1 of the SSSI due to coastal erosion, it may be beneficial to units 2 and 13 by allowing natural coastal processes to occur.

Option 2

Under Option 2 (Do Minimum), only small-scale patch repair maintenance of the existing defences will be carried out as and when required. This would help delay / reduce the rate of erosion in the short and medium term.

[7] Natural England (2013): 'NCA Profile: Dorset Heaths (NE506)', [online] available to access via this link
[8] Historic England (no date): 'Multi-period landscape on Hengistbury Head', [online] available to access via this link
[9] Johns et al. (2018): 'Rapid Coastal Zone Assessment Survey Phase One Desk-based Assessment for South-West England (South Coast Dorset) 6673', [online] available to access via this link

However, once the defences fail, the impacts of erosion could be to be similar to Option 1 (Do Nothing), and therefore the same likely significant effects are concluded across the SEA topics.

Option 2 is expected to have a major negative effect on the historic environment category based on the same reasoning as Option 1. Whilst the erosion would be delayed and there is uncertainty as to how it would progress when existing defences are no longer maintained in the long term, erosion has the potential to result in the large-scale loss of parts of 'Multi-period landscape on Hengistbury Head' scheduled monument, as well as the non-designated occupation sites found around the headland. There is also potential for impacts to the historic environment and heritage assets within Christchurch Harbour itself if the stabilising influence and shelter provided by the headland is reduced in the future. If this option is taken forward, it is recommended that a programme of recording is undertaken to monitor impacts and findings of any erosion on the historic assets.

Option 3

Under Option 3 (Improve), a new rock revetment would be constructed along the base of the cliff (during epoch 1), with the aim of minimising further erosion (but not stopping it entirely). Due to this, minor positive long-term significant effects are predicted across the climate change, population and communities, and transport and movement SEA topics.

Under the biodiversity and geodiversity SEA topic, neutral effects are predicted as there would be both positive and negative effects. In terms of positive effects, this option would limit erosion of the Dorset Heathlands SPA and Dorset Heaths SAC. In terms of negative effects, this option would likely hinder natural coastal processes from occurring in units 2 and 13 of the SSSI. The cliff face falls within unit 13 of the SSSI and is currently in a favourable condition. Limiting further erosion under this option could therefore impact the geodiversity of the cliff.

Concerning the landscape SEA topic, minor negative significant effects are considered likely under this option as upgraded defences could be much larger in size than the existing defences, which could impact the landscape and visual appeal of the area. In addition, as some erosion will still take place under this option, landscape and seascape character, both within the ODU and wider bay, is likely to change to some degree.

Minor negative significant effects are also considered likely under the historic environment SEA topic. This option will limit the loss of parts of 'Multi-period landscape on Hengistbury Head' scheduled monument, as well as the non-designated occupation sites found around the headland, by regulating erosion. Rapid or large-scale losses of the archaeological resource would not be expected as part of this option. However, construction could result in some disturbance, compression or loss of archaeological deposits on Hengistbury Head. Construction impacts would need to be mitigated and it is also recommended that a programme of recording is undertaken to monitor impacts and findings.

Option 4

Under Option 4 (Managed Realignment), the cliff would continue to erode, but the rate of erosion would be controlled through the maintenance / refurbishment of existing toe defences and ongoing beach recycling. The ongoing erosion of the cliff face would help sustain the geological interest of the cliff and could be beneficial to the condition of unit 13 of the SSSI. Furthermore, whilst erosion would still occur, it would be in a controlled manner, which would limit the potential loss of habitat at the Dorset Heaths SAC and Dorset Heathlands SPA. This would lead to an overall benefit to the SAC and SPA relative to Option 1 (Do Nothing) (where erosion would be uncontrolled). Due to this, minor positive long-term significant effects are predicted under the biodiversity and geodiversity and landscape SEA topics, as this option does more to protect the European sites. Note that potential LSE was screened in as part of this option in the HRA screening and will be considered in more detail.

Controlled erosion would enable the area to continue to be used for recreation and amenity, and therefore this option is also considered likely to lead to minor positive significant effects under the population and communities and transport and movement SEA topics.

The impact of controlled erosion on the historic environment, particularly regarding the 'Multi-period landscape on Hengistbury Head' scheduled monument, is difficult to predict under this option. Minor negative significant effects are considered likely under the historic environment SEA topic. Whilst some controlled erosion may occur, relative to the Do Nothing and Do Minimum options, this option is expected to largely limit the loss of parts of 'Multi-period landscape on Hengistbury Head' scheduled monument, as well as the non-designated occupation sites found around the headland. This option would also ensure the integrity of the headland and that it will continue to stabilise the wider coastline and provide shelter to Christchurch harbour. Rapid or large-scale losses of the archaeological resource would not be expected as part of this option. However, construction

(refurbishment of the defences) could result in some disturbance, compression or loss of archaeological deposits on Hengistbury Head. Construction impacts would also need to be mitigated and it is also recommended that a programme of recording is undertaken to monitor impacts and findings of any erosion.

Uncertainty is noted under the climate change SEA topic because the rate of erosion under this option could lead to flooding of the beach huts to the northeast of the ODU (within ODU 2).

All Options

Neutral effects are predicted under the land, soil and water resources SEA topic across all four options because they are unlikely to impact these resources. This is because the land in this location is not used for agricultural purposes, nor are there any historical landfill sites, drinking water protected areas/ safeguard zones, or source protection zones in this location.

Under all four options, the disturbance, compression or loss of archaeological remains on Hengistbury Head will need to be monitored and mitigated, for example through a programme of recording.

### 6.3.1 Cumulative effects

The options under ODU 1 could lead to cumulative effects with the project that is underway to replace Hengistbury Head Long Groyne.[10] Improving the long groyne is likely to have a positive influence and support the options in ODU 1 as the long groyne will provide a stabilising influence on the headland by helping to retain beach material in the area, providing a defence against wave attack of the cliff toe from the south-west.

Through discussions with BCP council it is understood that the long groyne is being designed to allow for similar amounts of sediment transport around the groyne in the future, therefore the longshore sediment source to ODUs 1 and 2 should not be impacted by the long groyne replacement.

If taken forward, the Do Nothing option could lead to negative cumulative effects with the long groyne replacement project, as there is a risk of outflanking of the groyne if the coastline in ODU 1 were to erode significantly. If this were to occur then similar environmental effects to those assessed in the section above for Do Nothing could occur. Similar effects could also occur under the Do Minimum option, but the effects would be delayed and only start to occur in the long-term once the existing defences in ODU 1 are no longer able to be repaired sustainably. The Managed Realignment and Improve options support and align with the long groyne replacement scheme, and the positive environmental effects associated with these options would likely still occur with the long groyne replacement.

Any decisions made within this ODU will also have knock-on effects on ODU 2 (Mudeford Sandbank), and therefore this should be considered when deciding which option to progress with.

## 6.4 Leading Option selection

Two Leading Options were selected for ODU 1 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Do Minimum.
- Local Aspirational Option: Managed Realignment.

Delivery of the Local Aspirational Option (Managed Realignment) is likely to lead to greater environmental benefits as indicated by the SEA. Minor positive significant effects are predicted under four SEA topics, with uncertainty only noted under the climate change SEA topic. Whilst minor negative significant effects are predicted under the historic environment SEA topic, in terms of the other SEA topics this option performs the most favourably of the four options.

Any negative effects of the leading options on the environmental receptors should be appropriately monitored and mitigated. For example, for the historic environment, it is recommended that a programme of recording is established for heritage assets and an archaeological assessment undertaken.

Overall, whilst the Local Aspirational option is expected to have a negative effect on the historic environment, this would be expected to be less significant relative to the National Economic option. The Local Aspirational option

[10] BCP Council (2023): 'Repair and upgrade of Hengistbury Head Long Groyne', [online] available to access via this link

would help retain the stabilising influence of the headland on the coastline and provide shelter to the historic assets within Christchurch Harbour. However, funding is not certain for this option, and if funding cannot be achieved the National Economic Option (Do Minimum) would be delivered.

# 7. SMZ 1 – ODU 2: Mudeford Sandbank options assessment

## 7.1 Introduction

ODU 2 (shown in **Figure 7.1** below) covers the entirety of Mudeford Sandbank, including the open coast and harbour side. The sandbank is fronted by rock groynes along its length (seaward side) and the narrowest part of the sandbank has a seawall. With no further maintenance or beach management there is a risk of the sandbank breaching in the future, which would be significant as there is a strategic link between the sandbank and the coastal processes within the harbour. There are beach huts located along the sandbank, and several non-residential properties are serviced by buried services that pass beneath the Sandbank and the run to Mudeford Quay.

Over the next 100 years, the 'Do Nothing' present value (PV) damages are estimated to be between £0.1-0.2 million.

The SMP[11] policy for the open coast part of the unit is to 'Hold the Line' in the short-term, followed by 'Managed Realignment' in the medium- and long-term. The intent is to allow the gradual rollback of the sandbank over time in line with SLR. The harbour side policy is for 'Managed Realignment' to allow rollback of the sandbank.

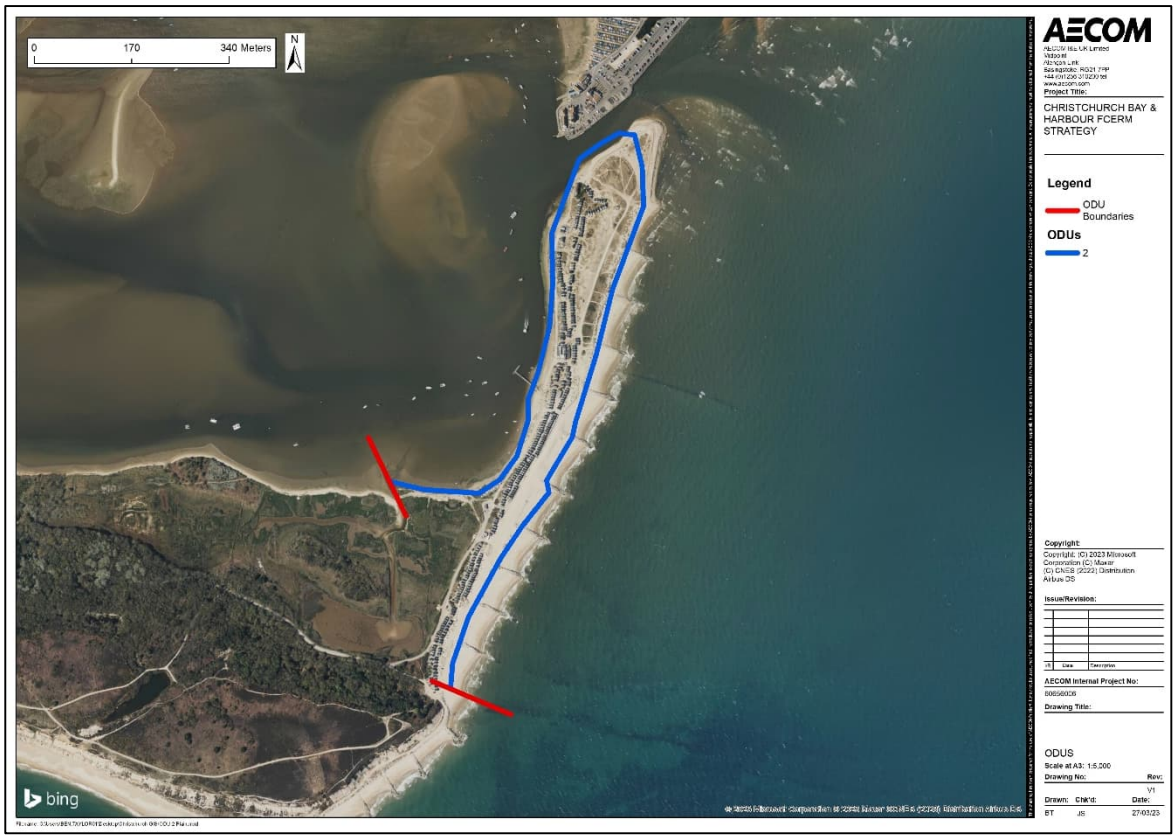


**Figure 7.1 ODU 2**

[11] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

# 7.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure H&S compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences from epoch 1; this would not alter the geometry of the existing defences (e.g. footprint/ height of defences would remain the same as today); this option also includes beach recycling to help sustain the beach levels. Beach nourishment from epoch 3 to sustain beach levels in line with sea level rise. Objective of this option would be to sustain the service of the Sandbank (in FCERM terms) and aim to hold the Sandbank in its current position. Opportunities for sand dune creation / restoration as part of this option would be explored.
4. **Improve**: same approach as Maintain over epochs 1 and 2. However, in epoch 3 upgrade the defences to provide a more robust defence system. This would likely involve constructing new larger rock revetment along the length of the Sandbank, rock groynes and a beach nourishment scheme.
5. **Managed Realignment**: same defence measures as Maintain through the appraisal period. However, intent of this option would be to allow the Sandbank to rollback over time in a controlled manner, whilst sustaining the FCERM service. Existing rock revetment and groynes could be moved over time to encourage / control the rollback process and beach recycling would be used to move material to the desired locations.
6. **Maintain with Adaptation/ Resilience**: same approach as the Maintain option, but with local level property level protection measures to the small number of permanent properties on the Sandbank.

# 7.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 7.1** below and discussed in more detail underneath.

### Table 7.1 Assessment findings for ODU 2

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** |
| Biodiversity and geodiversity | ? | ? | + | + | ? | + |
| Climate change | -- | -- | ++ | ++ | ++ | ++ |
| Landscape | -- | -- | + | + | ? | + |
| Historic environment | -- | -- | + | + | - | + |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | - | -- | + | + | + | + |
| Transport and movement | 0 | 0 | 0 | 0 | 0 | 0 |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The land between the harbour side and open coast boundaries of the ODU falls within unit 3 (Salt Hurns) of the Christchurch Harbour SSSI[12], whilst the harbour side of the Sandbank borders unit 12 (Christchurch Harbour).

The main habitat of unit 3 (Salt Hurns) of the SSSI is littoral sediment. The unit is currently in a favourable condition, showing gradation of saltmarsh communities from upper to lower middle marsh and frequent creeks and pools.

The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

The main habitat of unit 12 (Christchurch Harbour) is also littoral sediment. The unit is also currently in a favourable condition. One of the reasons for notification of this SSSI is the variety of bird species that the site supports. The number of species both breeding and over-wintering are stable and increasing. The SSSI is also important for birds on migration. An assessment has also been made for this unit of the rare plant (Red Data Book species) *Eleocharis parvula*, Dwarf spike rush. The main colony is relatively stable and large numbers are present on substrate exposed at extreme low tides.

The Sandbank is a Site of Nature Conservation Interest (SNCI). In addition, the ODU borders Hengistbury Head LNR[13] to the southwest. The open coast boundary of the ODU also borders Dorset Heaths SAC[14] and Dorset Heathlands SPA, also located to the southwest of the ODU. In terms of BAP priority habitats, there are two small areas of coastal sand dunes in the northern extent of the Sandbank. The land between the harbour side and open coast boundaries of the ODU primarily comprises coastal saltmarsh. The harbour side boundary of the ODU, as well as part of the harbour side of the Sandbank, borders mudflats. In addition, the end of the Sandbank is the only location that ringed plover currently breeds within the BCP area. It is also used as a breeding site for oystercatchers and is an important high tide roost for birds of the harbour. The Sandbank is home to Sea Knotgrass and other vegetated shingle plant species.

In terms of flood risk, much of the Sandbank is within Flood Zone 3, as it is not much higher than sea level. Whilst there are few properties on the Sandbank, beach huts are located along almost the entire length of the Sandbank. In addition, the Sandbank provides flood protection to Christchurch Harbour. Whilst there are no pRoWs in this location, Hengistbury Head to the southwest contains an informal footpath which is used to access the Sandbank.

The ODU falls within the Dorset Heaths[15] National Character Area (NCA), which today contains some of the best lowland heath left in England. It is also recognised that the Sandbank provides shelter to Christchurch Harbour, and therefore greatly influences the landscape here.

With regards to the historic environment, part of the southern extent of the Sandbank falls within the 'Multi-period landscape on Hengistbury Head' scheduled monument[16]. In addition, the northern extent of the ODU is 70m south of grade II listed building 'Dutch Cottages Haven Cottages', located in Mudeford Ferry Terminal on the other side of the mouth to the harbour (in ODU 11). The northern extent of the ODU is adjacent to Mudeford Quay Conservation Area, which covers this listed building. There are also undesignated wreck sites and Grade II listed buildings within the wider area.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. The existing defences are likely to fail over time, which could lead to the uncontrolled evolution of the Sandbank, which may include breaching or rolling back into the harbour. This could impact the habitats in the harbour, including the bird species that frequent it, and lead to the erosion of part of the 'Multi-period landscape on Hengistbury Head' scheduled monument and loss of beach huts. In addition, if the Sandbank were to breach, this could have adverse effects on the many designated heritage assets within Christchurch Harbour. Due to this, major negative long-term significant effects are predicted under the climate change, landscape, historic environment, and population and communities SEA topics.

Under this option, the disturbance, compression or loss of archaeological remains on Hengistbury Head will need to be monitored and mitigated, for example through a programme of recording.

[12] Natural England (no date): 'Christchurch Harbour SSSI', [online] available to access via this link
[13] Natural England (no date): 'Hengistbury Head LNR', [online] available to access via this link
[14] JNCC (no date): 'Dorset Heaths', [online] available to access via this link
[15] Natural England (2013): 'NCA Profile: Dorset Heaths (NE506)', [online] available to access via this link
[16] Historic England (no date): 'Multi-period landscape on Hengistbury Head', [online] available to access via this link

With regards to the biodiversity and geodiversity SEA topic, uncertainty is noted under this option as large-scale changes to the morphology of the harbour could arise, which could impact habitats and species in the harbour. However, this will depend on how the Sandbank evolves (which is highly uncertain), and there is potential for both negative and positive effects to arise.

Option 2

Under Option 2 (Do Minimum), only small-scale patch repair maintenance of the existing defences will be carried out as and when required. This would help to delay the failure of existing defences in the short-term. However, in the medium- and long-term, the evolution of the Sandbank is likely to be similar to Option 1 (Do Nothing) Therefore, the same likely significant effects are concluded across the SEA topics.

Under this option, the disturbance, compression or loss of archaeological remains on Hengistbury Head will need to be monitored and mitigated, for example through a programme of recording.

Option 3

Under Option 3 (Maintain), existing defences would be routinely refurbished, beginning in epoch 1, alongside beach management / recycling to help sustain beach levels. This option also includes beach nourishment in epoch 3, to top-up beach levels in the future so that the FCERM function of the Sandbank can be sustained with sea level rise. This option aims to hold the Sandbank in or close to its current position over time, leading to positive effects across the majority of the SEA topics.

It is noted that under this option, opportunities for sand dune restoration / creation will be explored as part of the beach management activities. This could lead to BNG, and therefore minor positive long-term significant effects are considered likely under the biodiversity and geodiversity SEA topic, as sand dune restoration / creation could create important habitat areas on the Sandbank. In addition, this option provides more certainty with respect to the position of the Sandbank over time, but this has not been factored into the scoring as it is unclear if this would create a positive or negative effect on habitats within the harbour.

Ongoing beach recycling and beach nourishment would help to sustain the crest level of the Sandbank in the future relative to rising sea levels, which is considered likely to lead to major positive significant effects for the climate change SEA topic, and minor positive significant effects across the landscape, historic environment and population and communities SEA topics.

Regarding the historic environment SEA topic, this option will likely prevent the disturbance, compression or loss of the northern and eastern boundaries of the ‘Multi-period landscape on Hengistbury Head’ scheduled monument. In addition, holding the Sandbank close to its current position will mean that it continues to provide shelter to the numerous designated heritage assets and also undesignated assets / unknown archaeology within Christchurch Harbour.

Option 4

Under Option 4 (Improve), a similar approach to Option 3 (Maintain) would be undertaken in epoch 1 and 2. However, in epoch 3, the defences would be upgraded with a new rock revetment, groynes and beach nourishment. Due to this, the same likely significant effects are concluded across the SEA topics as Option 3 (Maintain). This includes biodiversity and geodiversity, as opportunities for sand dune creation would be explored.

Option 5

Under Option 5 (Managed Realignment), controlled rollback of the Sandbank would occur over time, and the FCERM standard of service of the Sandbank would be sustained. This would help to retain the recreation and amenity function of the Sandbank, which would lead to major positive significant effects for the climate change SEA topic, and minor positive significant effects for the population and communities SEA topic.

Uncertainty is noted under the biodiversity and geodiversity SEA topic, as it is uncertain how the Sandbank rolling back over time (albeit in a controlled manner) would impact habitats and species in the harbour area. Through feedback and discussions with Natural England, changes to natural processes which may modify the extent of biodiversity features in the harbour could be either positive or negative and more work would be required to confirm this.

Uncertainty is also noted under the landscape SEA topic, as it is unclear how the controlled rollback of the Sandbank may impact the landscape of the Sandbank or the harbour.

Minor negative long-term significant effects are predicted under the historic environment SEA topic as the rollback of the Sandbank could increase the exposure of the eastern boundary of the 'Multi-period landscape on Hengistbury Head' scheduled monument. Under this option, the disturbance, compression or loss of archaeological remains on Hengistbury Head will need to be monitored and mitigated, for example through a programme of recording. It is also unclear whether the controlled rollback of the Sandbank would continue to provide the same level of shelter to the numerous designated heritage assets within Christchurch Harbour. For example, as the Sandbank moves the cross shore profile may change, which may impact the level of protection it provides against wave overtopping and inundation during storm conditions. Due to this uncertainty, minor negative significant effects have been concluded for this option under the historic environment SEA topic.

Option 6

Under Option 6 (Maintain with Adaptation / Resilience), similar effects to Option 3 (Maintain) would be expected. This is because this is largely the same option, but with the addition of property level protection to a small number of properties on the Sandbank. This would not be expected to significantly alter the likely significant effects across any of the SEA topics relative to Option 3 (Maintain).

Minor positive significant effects are noted under the biodiversity and geodiversity SEA topic, which is related to opportunities for sand dune creation under this option, and associated BNG. In addition, this option provides more certainty with respect to the position / morphological evolution of the Sandbank over time, which could potentially have a positive or negative effect on existing habitats. However, this has not been factored into the scoring as the impacts are uncertain and more work would be required to investigate this in the future.

Minor positive significant effects are anticipated under the historic environment SEA topic as this option will likely prevent the disturbance, compression or loss of the northern and eastern boundaries of the 'Multi-period landscape on Hengistbury Head' scheduled monument. In addition, holding the Sandbank close to its current position will mean that it continues to provide shelter to the numerous designated heritage assets and also undesignated assets / unknown archaeology within Christchurch Harbour.

All Options

Neutral effects are predicted under the land, soil and water resources SEA topic across all six options because they are unlikely to impact these resources. This is because the land in this location is not used for agricultural purposes, nor are there any historical landfill sites, drinking water protected areas/ safeguard zones, or source protection zones in this location.

Neutral effects are also predicted under the transport and movement SEA topic across all six options as there is no official transport infrastructure along the Sandbank.

## 7.3.1 Cumulative effects

There is potential for decisions made within this ODU to interact with the long groyne replacement at Hengistbury Head (adjacent to ODU 1).[17] Through discussions with BCP council it is understood that the long groyne is being designed to allow similar amounts of sediment transport around the groyne in the future, therefore the longshore sediment source to ODUs 1 and 2 should not be impacted by the long groyne replacement.

The Maintain, Managed Realignment and Improve options would support and align with the long groyne replacement scheme, and the positive environmental effects associated with these options would still be expected to occur with the long groyne replacement.

[17] Ibid.

# 7.4 Leading Option selection

Two Leading Options were selected for ODU 2 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Do Minimum.
- Local Aspirational Option: Maintain with Adaptation.

Delivery of the Local Aspirational Option (Maintain with Adaptation) is likely to lead to environmental benefits across a range of categories as indicated by the SEA. There are also opportunities for BNG with this option such as Sand Dune creation. However, funding is uncertain and if funding cannot be achieved the National Economic Option (Do Minimum) would be delivered.

Any negative effect of the leading options on the SEA topics should be appropriately monitored and mitigated. For example, from an historic environment perspective, mitigation could include a programme of recording.

For the historic environment, delivering the Local Aspirational option is likely to be preferable compared to the National Option. Holding the Sandbank close to its current position will mean that it continues to provide shelter to the numerous designated heritage assets and also undesignated assets / unknown archaeology within Christchurch Harbour.

# 8. SMZ 2 – ODU 3: Christchurch Harbour South options assessment

## 8.1 Introduction

ODU 3 (shown in **Figure 8.1** below) is over 5km long and covers the southern side of Christchurch Harbour. The ODU is largely undefended with no formal coastal defences present. The SMP2 erosion zones do not cover much of this ODU and therefore the risk of erosion is largely unknown. However, given the sheltered estuary environment, the erosion risk is expected to be low. Over the next 100 years, the total PV damages for this unit are estimated to be approximately £1million under the baseline scenario.

The SMP[18] policy for ODU 3 is therefore 'No Active Intervention' from the present day. This approach aligns with the 'Do Nothing' strategic option.


**Figure 8.1 ODU 3**

## 8.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing seawall defences (as and when required).

[18] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

3. **Maintain A**: small-scale patch-repair to existing seawall defence (as and when required), but new slope armouring (erosion defence) adjacent to road access point to Hengistbury Head (epoch 1).
4. **Maintain B**: as per Option 3 (Maintain A), but also with new slope armouring (erosion defence) adjacent to historic landfill site in north-west part of the unit (to prevent this eroding) (epoch 1).
5. **Adaptation/ Resilience A**: property level protection measures to the small number of properties at risk of flooding (from epoch 1). No erosion defences to access road or historic landfill site.
6. **Adaptation/ Resilience B**: as per Option 3 (Maintain A), but with property level protection to the small number of properties at risk of flooding (from epoch 1).
7. **Adaptation/ Resilience C**: as per Option 4 (Maintain B), but with property level protection to the small number of properties at risk of flooding (from epoch 1).

# 8.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 8.1** below and discussed in more detail underneath.

## Table 8.1 Assessment findings for ODU 3

| | Option number | | | | | | |
|---|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| Biodiversity and geodiversity | - | - | 0 | 0 | - | 0 | 0 |
| Climate change | ? | ? | ? | ? | + | + | + |
| Landscape | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Historic environment | - | - | ? | ? | - | ? | ? |
| Land, soil and water resources | ? | ? | + | ++ | ? | + | ++ |
| Population and communities | ? | ? | + | + | + | ++ | ++ |
| Transport and movement | ? | ? | ++ | ++ | ? | ++ | ++ |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The entire length of ODU 3 falls within units 3 (Salt Hurns), 5 (Wick Hams), 6 (Wick Spires), 7 (Wick Fields) and 8 (Wick Farm Meadows) of the Christchurch Harbour SSSI[19]. The main habitat for units 3, 5 and 6 is littoral

[19] Natural England (no date): 'Christchurch Harbour SSSI', [online] available to access via this link

sediment, whilst for unit 7 it is acid grassland (lowland) and for unit 8 it is neutral grassland (lowland). All of these units are currently in a favourable condition.

The estuary to the north, which borders this ODU, is within unit 12 (Christchurch Harbour) of the SSSI. The main habitat here is littoral sediment and the unit is currently in a favourable condition. One of the reasons for notification of this SSSI is the variety of bird species that the site supports. The number of species both breeding and over-wintering are stable and increasing. The SSSI is also important for birds on migration. An assessment has also been made for this unit of the rare plant (Red Data Book species) *Eleocharis parvula*, Dwarf spike rush. The main colony is relatively stable and large numbers are present on substrate exposed at extreme low tides.

The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA. The entire length of the ODU also falls within Hengistbury Head LNR[20]. In addition, a small part of the ODU, near the south eastern boundary, is within the Dorset Heaths SAC[21] and Dorset Heathlands SPA, which covers Hengistbury Head. The ODU also briefly comes into contact with the River Avon SAC[22] and unit 56 (Hampshire Avon Lower (downstream Fordingbridge)) of the River Avon System SSSI[23], near the north western boundary. Unit 56 of the SSSI is currently in an unfavourable condition because this part of the river fails to achieve favourable conditions for all six attributes assessed, covering a wide range of condition indicators. Many of these indicator failures are linked with nutrient eutrophication and river channel modification.

In terms of BAP priority habitats, the entire length of the ODU is covered by priority habitats. In order, starting at the north western boundary of the ODU and ending at the south eastern boundary, this includes coastal and floodplain grazing marsh, coastal saltmarsh, lowland dry acid grassland, lowland heathland, deciduous woodland, and mudflats.

In terms of flood risk, much of the southern bank of Christchurch Harbour is within Flood Zone 3, particularly the area to the east of Wick and the area to the north of Hengistbury Head. However, there are very few properties along the length of the ODU; there is one property near the north western boundary, and another (Hengistbury Head Adult Sailors Club) in the mid-section of the ODU. Nevertheless, the south eastern half of the ODU is adjacent to a footpath (Hengistbury Head footpath) that provides access to Hengistbury Head and on to Mudeford Sandbank (ODU 2).

The ODU falls within the Dorset Heaths[24] National Character Area (NCA), which today contains some of the best lowland heath left in England.

With regards to the historic environment, the south eastern half of the ODU falls within the 'Multi-period landscape on Hengistbury Head' scheduled monument[25]. Whilst not within the limits of the ODU, the north western boundary of the ODU is near a cluster of seven grade II listed buildings along Wick Lane and Wick Green, the closest of which is 30m west of the boundary. In addition, the north facing shore of Hengistbury Head – which is covered by the ODU – was important as an Iron Age harbour.[26]

With regards to land, soil and water resources, there are two historic landfill sites[27] along the length of the ODU. The larger of the two is located to the east of Southbourne, whilst the other is located to the west of Hengistbury Head. These areas could potentially have contaminated materials present but this would need to be confirmed by site investigations. The erosion risk to these sites is expected to be low due to the sheltered harbour environment but erosion could still occur in the future. The sites are currently undefended and unlike other historic landfill sites around the harbour, they are not retained by retaining walls, quay walls or embankments. If erosion were to occur it would therefore likely be more gradual and wouldn't be linked to the sudden failure of a retaining structure.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. ODU 3 is mainly undefended, apart from a small length of seawall adjacent to Hengistbury Head Adult Sailors Club. Much of the area is at risk of flooding and there is uncertainty as to how each of the SEA topics may be impacted in the future. Given the sheltered harbour environment, the erosion risk is expected to be low / very minor, but it could

[20] Natural England (no date): 'Hengistbury Head LNR', [online] available to access via this link
[21] JNCC (no date): 'Dorset Heaths', [online] available to access via this link
[22] JNCC (no date): 'River Avon', [online] available to access via this link
[23] Natural England (no date): 'River Avon System SSSI', [online] available to access via this link
[24] Natural England (2013): 'NCA Profile: Dorset Heaths (NE506)', [online] available to access via this link
[25] Historic England (no date): 'Multi-period landscape on Hengistbury Head', [online] available to access via this link
[26] Cunliffe (1990): 'Hengistbury Head: A late prehistoric haven', [online] available to access via this link
[27] Catchment Based Approach Data Hub (2019): 'Historic Landfill Sites', [online] available to access via this link

still occur, and therefore uncertainty is noted across the majority of SEA topics, except for biodiversity and geodiversity.

Erosion could lead to the loss of important habitats, such as the Dorset Heaths SAC and Dorset Heathlands SPA. Therefore, minor negative significant effects are predicted under the biodiversity and geodiversity SEA topic.

It is recognised that erosion could lead to the loss or realignment of Hengistbury Head footpath, which could result in physical losses of the 'Multi-period landscape on Hengistbury Head' scheduled monument, and/ or reduced public access and enjoyment of the scheduled monument. Due to this, minor negative long-term significant effects is noted under the historic environment SEA topic. It is worth noting that due to the sheltered harbour environment, the erosion would be expected to be very low / minor, but to be conservative a negative scoring for this SEA topic has been provided.

It is also noted that the erosion of Wick historic landfill site could lead to the release of contaminated material into the environment. However, the contaminated status of the historic landfill sites in this location are unknown, and therefore uncertainty is noted under the land, soil and water resources SEA topic.

Option 2

Under Option 2 (Do Minimum), only small-scale patch repair maintenance of the existing seawall will be carried out as and when required. In this respect, this option does not differ drastically from Option 1 (Do Nothing), and this is reflected in the assessment findings.

Option 3 and Option 6

Options 3 (Maintain A) and 6 (Adaptation/ Resilience B) deliver small-scale patch-repair to the existing seawall defence, as well as new slope armouring adjacent to the access route to Hengistbury Head, where the smaller historic landfill site is located. Due to this, major/ minor positive long-term significant effects are predicted under the population and communities and transport and movement SEA topics as access to Hengistbury Head would be maintained.

Minor positive significant effects are also predicted under the land, soil and water resources SEA topic, as the slope armouring would help reduce the risk of erosion to the smaller historic landfill site in this location. Whilst there is uncertainty associated with the contamination status of this site, defending the site would reduce the risk of erosion (the pathway). Major positive significant effects have not been predicted under this SEA topic as the larger historic landfill site at Wick would not be defended. Therefore, there remains the potential for erosion of historic landfill in this location.

With respect to the biodiversity and geodiversity SEA topic, both of these options are considered likely to lead to neutral effects. The erosion defences at the access route to Hengistbury Head would prevent erosion of the Dorset Heaths SAC and Dorset Heathlands SPA, helping to preserve the integrity of these designations. However, there is potential for some habitat loss depending on the defence alignment that is used for the erosion defence. The alignment will need to be determined during further design work.

Regarding the historic environment SEA topic, the new slope armouring adjacent to the access route to Hengistbury Head has the potential to disturb archaeological remains, including the 'Multi-period landscape on Hengistbury Head' scheduled monument. It could also impact the setting of the scheduled monument. However, uncertainty is noted at this stage as effects depend on the detailed design of the slope armouring and the mitigation measures implemented. A positive effect of these options are that they would prevent erosion of the access route and therefore public access to the monument would not be reduced.

Option 6 (Adaptation/ Resilience B) differs from Option 3 (Maintain A) as it provides property-level protection to the properties at risk of flooding in this location. Therefore, major positive significant effects are predicted under the population and communities SEA topic for Option 6, and minor positive significant effects are predicted under the climate change SEA topic.

Option 4 and Option 7

Options 4 (Maintain B) and 7 (Adaptation/ Resilience C) deliver the same measures as those outlined under Option 3 (Maintain A) and Option 6 (Adaptation/Resilience B) respectively, except they also deliver new slope armouring adjacent to the larger historic landfill site in the unit. Similar major/ minor long-term positive significant effects are predicted under these options, and this is reflected in the assessment findings. However, under these

options, the additional defence to the larger historic landfill site is considered likely to lead to major positive significant effects under the land, soil and water resources SEA topic, as both historic landfill sites would be defended from erosion.

With respect to the biodiversity and geodiversity SEA topic, as with Options 3 and 6, neutral effects are predicted. The erosion defences would help to reduce erosion risk to land based habitats and species, but depending on the alignment used, this could lead to some habitat loss along the defence alignment. The HRA screening has identified the potential for an LSE in this location, and therefore the impacts on European sites are to be investigated further as part of the Strategy.

Regarding the historic environment SEA topic, as with Options 3 and 6, the new slope armouring adjacent to the access route to Hengistbury Head has the potential to disturb archaeological remains, including the 'Multi-period landscape on Hengistbury Head' scheduled monument. It could also impact the setting of the scheduled monument. However, uncertainty is noted at this stage as effects depend on the detailed design of the slope armouring and mitigation measures implemented. A positive effect of these options are that they would prevent erosion of the access route and therefore public access to the monument would not be reduced.

Option 7 (Adaptation/ Resilience C) differs from Option 4 (Maintain B) as it provides property level protection to the properties at risk of flooding in this location. Therefore, major positive significant effects are predicted under the population and communities SEA topic for Option 7, and minor positive significant effects are predicted under the climate change SEA topic.

Option 5

Option 5 (Adaptation/ Resilience A) would deliver property level protection measures to a small number of properties at risk from flooding in this unit, which will likely lead to minor positive significant effects under the climate change and population and communities SEA topics. However, no new defences would be provided elsewhere, and therefore there is uncertainty as to the impact on other SEA topics for this option (similar to Options 1 (Do Nothing) and 2 (Do Minimum)).

As with Options 1 and 2, it is recognised that erosion could lead to the loss or realignment of Hengistbury Head footpath, which could result in physical loss of the 'Multi-period landscape on Hengistbury Head' scheduled monument, and/ or reduced public access and enjoyment of the scheduled monument. In addition, this could also lead to a minor amount of erosion to land based designations such as Dorset Heathlands SPA and Dorset Heaths SAC. Due to this, minor negative long-term significant effects are noted under the historic environment and biodiversity / geodiversity SEA topics.

All Options

Neutral effects are predicted under the landscape SEA topic across all seven options as the risk of erosion in this ODU is low, leaving the landscape largely unchanged outside of extreme flood events, where low lying areas may temporarily flood.

### 8.3.1 Cumulative effects

The options under ODU 3 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location is largely undeveloped, and unlikely to be developed in the future due to the presence of a scheduled monument and two historic landfill sites.

## 8.4 Leading Option selection

Two Leading Options were selected for ODU 3 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Adaptation / Resilience A.
- Local Aspirational Option: Adaptation / Resilience C.

Delivery of the Local Aspirational Option (Adaptation / Resilience C) is likely to lead to environmental benefits under the transport and movement, land, soil and water resources SEA topics as indicated by the SEA. Funding for the Local Option is uncertain and if funding cannot be achieved the National Economic Option (Adaptation / Resilience A) would be delivered.

Any negative effect of the leading options on the environmental receptors should be appropriately monitoring and mitigated. For example, from a historic environment perspective, this could include a recording programme and also identifying alternative routes to Hengistbury Head if the National Option is delivered.

# 9. SMZ 2 – ODU 4: Wick options assessment

## 9.1 Introduction

ODU 4 (shown in **Figure 9.1** below) spans the southern side of the River Stour up to Tuckton Bridge. There are three main types of defence in this ODU: a natural verge in the eastern part of the ODU, an earth embankment around the northeast of Wick, and a steel sheet pile wall in the western part of the ODU. The large residential area of Wick is located within this ODU.

Whilst the present-day tidal flood risk is minor with only a small number of properties at risk, over time the risk increases with approximately 40 properties at risk from a 1 in 200-year event in 50 years' time, and over 120 properties at risk in 100 years' time. The flood risk will need to be mitigated from both the north and east directions, increasing the length/ cost of defence alignment relative to benefits delivered. Over the next 100 years, the total PV damages for this ODU are estimated to be £4.2 million.

The SMP[28] policy for ODU 4 is to 'Hold the Line' from the present day, with an intent to implement local defence improvements in line with sea level rise.


**Figure 9.1 ODU 4**

## 9.2 Strategic options

The strategic options for this ODU are as follows:

[28] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure H&S compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences from epoch 1.
4. **Sustain A**: construct new sheet pile/ quay wall along the frontline in the western part of the unit (fully replacing the existing sheet pile wall, epoch 1); in the eastern part of the unit, raise and lengthen the existing setback embankment (epoch 1); continue to raise and lengthen the defences over time to keep pace with SLR (epochs 2 and 3).
5. **Sustain B**: undertake repeat refurbishments of the existing frontline sheet pile wall in the western part of the unit over time; elsewhere raise and lengthen the existing setback embankment (epoch 1) and continue to do this to keep pace with SLR (epochs 2 and 3).
6. **Sustain C**: raise and lengthen the existing setback embankment over time to keep pace with SLR (epoch 1, then in epochs 2 and 3); do not maintain the existing sheet pile wall, leaving this to eventually fail; the sheet pile wall currently protects historic landfill, so risk of this eroding in the future when the wall fails.
7. **Improve A**: same as Sustain A, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).
8. **Improve B**: same as Sustain B, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).
9. **Improve C**: same as Sustain C, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).

# 9.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 9.1** below and discussed in more detail underneath.

### Table 9.1 Assessment findings for ODU 4

| | Option number | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| Biodiversity and geodiversity | ? | ? | 0 | + | + | 0 | + | + | 0 |
| Climate change | -- | -- | - | ++ | ++ | + | ++ | ++ | + |
| Landscape | ? | ? | ? | - | - | - | - | - | - |
| Historic environment | -- | -- | - | ++ | ++ | - | ++ | ++ | - |
| Land, soil and water resources | -- | -- | + | ++ | ++ | -- | ++ | ++ | -- |
| Population and communities | -- | -- | - | ++ | ++ | -- | ++ | ++ | -- |
| Transport and movement | -- | -- | - | ++ | ++ | - | ++ | ++ | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The eastern boundary of the ODU borders unit 8 (Wick Farm Meadows) of the Christchurch Harbour SSSI[29]. The main habitat here is neutral grassland (lowland) and the unit is currently in a favourably condition. The eastern boundary of the ODU also borders Hengistbury Head LNR[30] and the unit is also adjacent to the Solent and Dorset Coast marine SPA.

In terms of BAP priority habitats, this ODU contains deciduous woodland and coastal and floodplain grazing marsh.

In terms of flood risk, the southern bank of the River Stour is partially within Flood Zone 2/ 3. There is a public park and garden immediately adjacent to the River Stour. However, to the south of Wick Lane, which borders the southern edge of the park and garden, is the residential area of Wick.

The ODU falls within the Dorset Heaths[31] National Character Area (NCA), which today contains some of the best lowland heath left in England.

With regards to the historic environment, the eastern boundary of the ODU is in proximity to a cluster of seven grade II listed buildings, the closest of which is 25m south of the southern bank of the River Stour. There is another individual grade II listed building closer to the western boundary of the ODU, 150m south of the southern bank of the River Stour. In addition, scheduled monument 'Bowl barrow 390m east of Tuckton Roundabout' is in the mid-section of the ODU, 140m south of the southern bank of the River Stour. Notably, this ODU runs along the edge of Wick Village Conservation Area to the south, which covers some of these designated heritage assets.

With regards to land, soil and water resources, there is a historic landfill site[32] along the length of this ODU, covering the same area as the park and garden. The contamination status of the materials in the historic landfill site are unknown and site investigations would be required to confirm this. The landfill site is currently retained by a quay wall and if this wall were to fail it could lead to the erosion and the potential sudden release of some of the historic landfill material into the environment. Due to the uncertain contamination status, the potential impacts associated with the historic landfill site on the land, soil and water resources SEA topic are therefore uncertain.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Due to this, the existing quay wall and raised defences are likely to fail over time, increasing the risk of flooding in this location. Notably, approximately 40 properties would be at risk of flooding from a 1 in 200-year event in 50 years' time, and over 120 properties will be at risk in 100 years' time. Therefore, major negative long-term significant effects are predicted across the majority of the SEA topics. This includes major negative significant effects under the land, soil and water resources SEA topic if the historic landfill site is found to include contaminated material.

Regarding the historic environment SEA topic, major negative long-term significant effects are predicted because flood risk is likely to damage the listed buildings within the vicinity of this ODU. Flood risk maps for this location are available in the option development unit report (AECOM, 2022).

Option 2

Under Option 2 (Do Minimum), only small-scale patch repair maintenance of the existing defences will be carried out as and when required. This would extend the service life of the existing defences, but only by several years at most. Therefore, the medium- and long-term impacts would be expected to be similar to Option 1 (Do Nothing), and this is reflected in the assessment findings.

Option 3

Under Option 3 (Maintain), existing defences will be routinely refurbished, beginning in epoch 1. This would reduce the risk of the defence failing, and therefore minor positive significant effects are predicted under the land, soil and water resources SEA topic as the risk of erosion of historic landfill would be reduced. However, this option would not increase crest levels of the defences, and therefore the flood risk would increase over time due to sea level rise. Minor negative significant effects are therefore predicted across a range of SEA topics,

[29] Natural England (no date): 'Christchurch Harbour SSSI', [online] available to access via this link
[30] Natural England (no date): 'Hengistbury Head LNR', [online] available to access via this link
[31] Natural England (2013): 'NCA Profile: Dorset Heaths (NE506)', [online] available to access via this link
[32] Catchment Based Approach Data Hub (2019): 'Historic Landfill Sites', [online] available to access via this link

including climate change, the historic environment, population and communities, and transport and movement. Regarding the historic environment SEA topic, this is because flood risk could damage several listed buildings.

Neutral effects are predicted under the biodiversity and geodiversity SEA topic. It is likely that maintenance would be within the existing defence footprint and therefore habitat loss would be unlikely. The timing of maintenance works would need to be scheduled to avoid noise / disturbance to nearby species.

Option 4 and Option 7

Under Options 4 (Sustain A) and 7 (Improve A), a new frontline sheet pile wall would be constructed, replacing the existing sheet pile wall in the west. The existing setback embankment in the eastern part of the ODU would also be raised and lengthened under these options. Therefore, these options would reduce the risk of flooding to the whole of this ODU from both the north and east directions. Due to this, major positive long-term significant effects are predicted under the majority of SEA topics, including climate change, the historic environment, land, soil and water resources, population and communities, and transport and movement.

It is recognised that, whilst this option will likely reduce the risk of flooding to nearby listed buildings, it will be important that the design and construction of defences are sensitive to the character / setting of listed buildings, as well as the setting of the Wick Village Conservation Area. During design of the schemes as part of these options, mitigation to ensure the upgraded defences are in line with the character of the conservation area and listed buildings will be considered.

Both options are considered likely to lead to minor positive significant effects under the biodiversity and geodiversity SEA topic. There is potential for BNG improvements to be incorporated into the upgraded defences, which should be explored during further design / appraisal work. For example, the setback embankment provides an opportunity to develop a vegetated structure that incorporates features of wildlife interest and habitat creation. There is ample space in this unit and therefore construction would likely be within or close to the footprint of the existing defences, or would be setback for the raised defences, which could limit negative impacts. Construction of the new defences would need to be undertaken during a period to limit noise / disturbance on nearby species.

Upgraded defences would be higher than the existing defences and could therefore impact the landscape and views of the area. Minor negative significant effects are therefore predicted under the landscape SEA topic.

Option 5 and Option 8

Under Options 5 (Sustain B) and 8 (Improve B), the existing frontline sheet pile wall, which spans the western half of the ODU, would be refurbished (recurring refurbishment over course of appraisal period), whilst the existing setback embankment, which spans the eastern half of the ODU, would be raised and lengthened. Similar effects to Options 4 (Sustain A) and 7 (Improve A) are anticipated under these options, and similar BNG opportunities exist. This is reflected in the assessment findings.

Option 6 and Option 9

Under Options 6 (Sustain C) and 9 (Improve C), the existing setback embankment, which spans the eastern half of the ODU, would be raised and lengthened over time. However, the existing frontline sheet pile / quay wall, which spans the western half of the ODU, would not be refurbished. This increases the risk of it failing at the end of its residual service life and could lead to erosion of the park / open space and historic landfill site adjacent to the quay wall. The flood risk in this location would also increase over time due to sea level rise, as it would not be mitigated with new defences.

Under these options, minor negative long-term significant effects are predicted across the historic environment and transport and movement SEA topics due to the increase in flood risk over time in the undefended areas.

Regarding the historic environment SEA topic, flooding and erosion could impact the Wick Village Conservation Area in the park located seawards of the setback embankment alignment which is leading to the negative effect. However, the listed buildings within the conservation area would be defended as part of the setback embankment scheme as these are located landward of the likely alignment. When raising and lengthening of the existing setback embankment, it will be important that the design and construction of this is sensitive to the character / setting of listed buildings, as well as the setting of the Wick Village Conservation Area. During design of the schemes as part of these options, mitigation to ensure the upgraded defences are in line with the character of the conservation area and listed buildings will be considered.

Due to the potential for erosion of the park / open space and historic landfill site, major negative long-term significant effects are predicted under the land, soil and water resources and population and communities SEA topics.

For these options, neutral effects are predicted under the biodiversity and geodiversity SEA topic. For the setback embankment there will be an opportunity for BNG, similar to Options 4, 5, 7 and 8, which can be explored during further appraisal / design work. However, there is uncertainty as to how potential erosion of the historic landfill site along the frontline could impact biodiversity in the area. The HRA screening has screened in a potential LSE for this option, which will be explored in more detail.

Upgraded higher defences could impact the landscape, and therefore minor significant negative effects are considered likely under this SEA topic for these options.

### 9.3.1 Cumulative effects

The options under ODU 4 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location is already developed, and the undeveloped land is either within Flood Zone 3 or covered by a historic landfill site.

Potential cumulative effects with the Lower Stour Flood Risk Management Strategy that is currently being prepared by the Environment Agency have been considered. The two project teams have engaged in regular dialogue throughout the development of the projects. It is understood from the Lower Stour project team that no major interventions to manage flood risk in the vicinity of ODU 4 are being proposed as part of the Lower Stour Strategy and therefore cumulative effects on environmental receptors in ODU 4 should be minimal. Any cumulative effects on environmental receptors upriver arising from options in ODU 4 are also likely to be minimal given the downstream location and nature of the flood cell.

## 9.4 Leading Option selection

Two Leading Options were selected for ODU 4 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Sustain C.
- Local Aspirational Option: Sustain B.

Delivery of the Local Aspirational Option (Sustain B) is likely to lead to environmental benefits across a range of categories as indicated by the SEA. Funding is uncertain for the Local Aspirational option as the increase in cost is largely associated with maintaining the frontline quay wall to prevent erosion of the historic landfill site, which does not currently attract funding as part of the Environment Agency's Partnership Funding process. If funding cannot be achieved, it would be the aim to instead deliver the National Economic option (Sustain C) (this option is also subject to funding constraints, but less significantly).

Under the SEA topics where negative effects are expected to occur with the leading options, appropriate monitoring and mitigation would be required. For example, for the historic environment SEA topic, mitigation could include a programme of recording around the conservation area and ensuring the setback embankment is designed in accordance with the character / setting of the area and Wick Village Conservation Area.

There are opportunities for BNG for both options, but the Local Aspirational Option is the more environmentally sustainable option as it would help prevent potential negative effects under the land, soil and water resources and population and communities SEA topics.

# 10. SMZ 2 – ODU 5: Willow Drive and the Quomps options assessment

## 10.1 Introduction

ODU 5 (shown in **Figure 10.1** below) is located on the northern side of the River Stour, from Tuckton Bridge to the eastern end of the Quomps. A range of defences are located in this ODU, all in varying condition (from good to poor). Given the numerous private landowners and existing private defences in this location, for a flood risk mitigation scheme to be successful, there will need to be collaboration between land owners, owners of private defences, and the flood risk authorities.

Preserving access to the River Stour is likely to be a key consideration here (e.g. mooring and rowing club access). In addition, access over any setback defences is likely to be required, with a large number of flood gates/ access steps currently incorporated into the existing setback defence alignment in the eastern part of the ODU.

This ODU contains a significant number of properties at risk from tidal flooding. Between 35-40 properties are expected to be at risk from a present day 1 in 200-year event, increasing to over 560 properties at risk in 100 years' time. Over the next 100 years, the total PV damages for this ODU are estimated to be over £37million.

The SMP[33] policy for this area is 'Hold the Line' from the present day, with the intent to maintain and improve the flood defences.

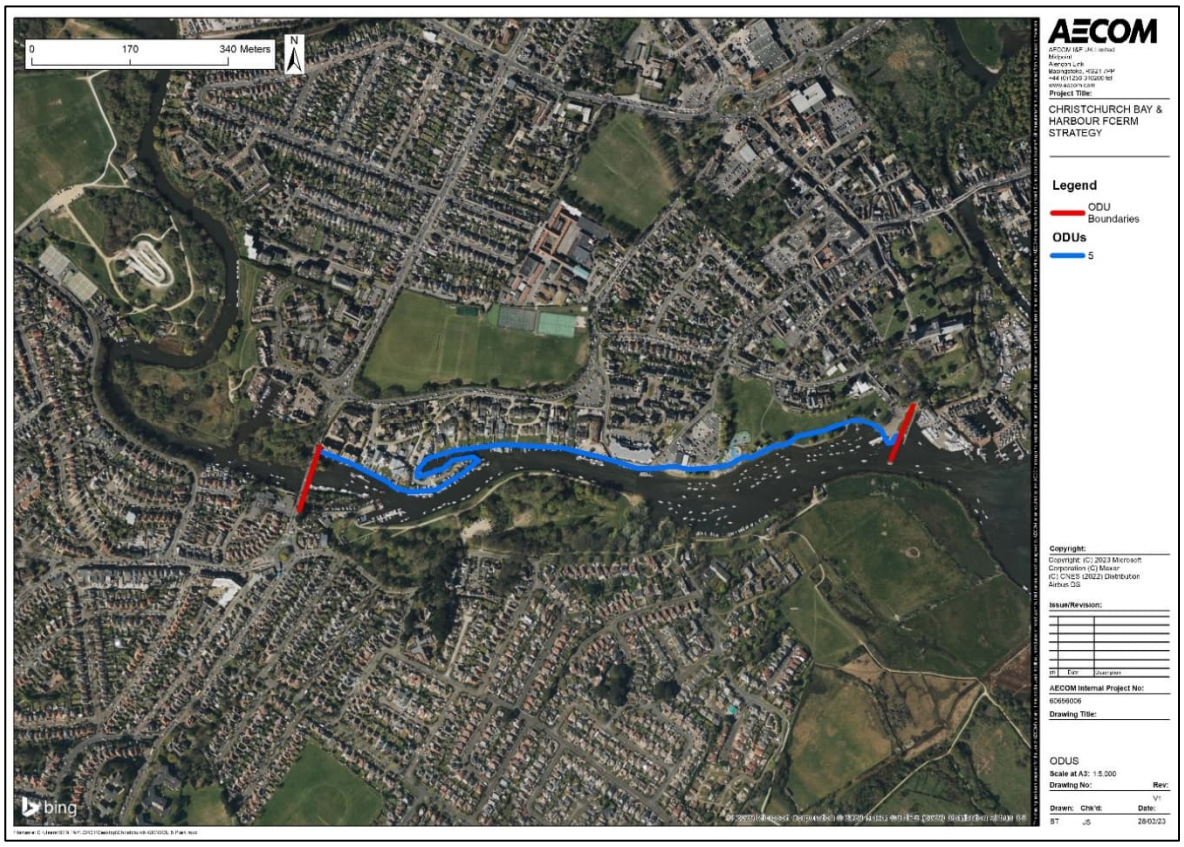


**Figure 10.1 ODU 5**

[33] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

# 10.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure H&S compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences through the appraisal period (from epoch 1).
4. **Sustain A**: construct a new frontline wall in the western part of the unit (along alignment of the existing quay wall) (epoch 1); this would incorporate a raised wall relative to ground levels to provide a flood defence, which would be further raised over time as sea levels rise; in addition, raise and lengthen the existing setback wall in the eastern part of the unit over time as sea levels rise (epoch 1, then epoch 2 and 3); maintain the frontline quay wall in the eastern part of the unit to prevent erosion of historic landfill site (epochs 1-3). Also includes Sustain D with delayed initial intervention.
5. **Sustain B**: construct a new frontline wall along the full length of the unit (along alignment of the existing frontline quay wall) (epoch 1); this would incorporate a raised wall relative to ground levels to provide flood defence, which would be further raised over time as sea levels rise (epochs 2 and 3). Also includes Sustain E with delayed initial intervention.
6. **Sustain C**: construct a new setback wall in the western part of the unit in the future (epoch 3); in addition, raise and lengthen the existing setback wall in the eastern part of the unit over time as sea levels rise (epoch 1, then epochs 2 and 3); maintain the frontline quay wall to prevent erosion of historic landfill (epochs 1-3). Also includes Sustain F with delayed initial intervention.
7. **Improve A**: as per Sustain A, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3). Also includes Improve D with delayed initial intervention.
8. **Improve B**: as per Sustain B, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3). Also includes Improve E with delayed initial intervention.
9. **Improve C**: as per Sustain C, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3). Also includes Improve F with delayed initial intervention.
10. **Adaptation / Resilience**: same approach to defence maintenance as Maintain, with property level protection to properties at risk of flooding.

# 10.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 10.1** below and discussed in more detail underneath.

## Table 10.1 Assessment findings for ODU 5

| | Option number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Biodiversity and geodiversity | ? | ? | ? | + | + | + | + | + | + | ? |
| Climate change | -- | -- | - | ++ | ++ | + | ++ | ++ | + | - |
| Landscape | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? |
| Historic environment | -- | -- | - | + | ? | + | + | ? | + | - |
| Land, soil and water resources | -- | -- | + | ++ | ++ | ++ | ++ | ++ | ++ | + |
| Population and communities | -- | -- | - | ++ | ++ | ? | ++ | ++ | ? | - |
| Transport and movement | -- | -- | - | ++ | ++ | + | ++ | ++ | + | - |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

ODU 5 is adjacent to the Solent and Dorset Coast marine SPA designated for biodiversity. However it is not adjacent to or within any other internationally, nationally or locally designated sites for biodiversity, nor does it contain any BAP priority habitats.

In terms of flood risk, the ODU is largely within Flood Zone 3. Numerous properties border the northern bank of the River Stour along the length of the ODU, many of which contain gardens that back onto private mooring areas. The Quomps playing field borders the northern bank near the eastern boundary of the ODU. In addition, Willow Way, Sopers Lane and Quay Road are all located close to the northern bank.

The ODU falls within the Dorset Heaths[34] National Character Area (NCA), which today contains some of the best lowland heath left in England.

With regards to the historic environment, the eastern boundary of the ODU is adjacent to one grade II* listed building and one grade II listed building at Place Mill. There is another grade II listed building located to the west of the eastern boundary of the ODU, in the Quomps, 20m north of the northern bank of the River Stour. Scheduled monument 'Pre-conquest monastery, early Christian cemetery, Augustinian priory and a motte and bailey castle at Christchurch' is also adjacent to the eastern boundary of the ODU, spanning a large area to Castle Street in the north. Notably, the schedule monument contains several listed buildings, including three grade I listed buildings. The eastern extent of the ODU, including the Quomps playing field, falls within Christchurch Central Conservation Area.

With regards to land, soil and water resources, there are two historic landfill sites[35] along the length of this ODU. One is located to the south of Willow Way, whilst the other is located in the Quomps playing field. The contamination status of the materials in the historic landfill sites are unknown and site investigations would be

[34] Natural England (2013): 'NCA Profile: Dorset Heaths (NE506)', [online] available to access via this link
[35] Catchment Based Approach Data Hub (2019): 'Historic Landfill Sites', [online] available to access via this link

required to confirm this. The landfill site at the Quomps playing field is retained by a quay wall and if this wall were to fail it could lead to the erosion and the potential release of some of the historic landfill material into the environment. Due to the uncertain contamination status, the potential impacts associated with the historic landfill site on the land, soil and water resources SEA topic are therefore uncertain.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Due to this, the existing defences are likely to fail over time, and in combination with the impacts of sea level rise, the risk of flooding would be expected to increase in this location. Notably, between 35-40 properties are currently at risk from flooding from a 1 in 200-year event, and over 560 properties would be at risk in 100 years' time. Therefore, major negative long-term significant effects are predicted across the majority of SEA topics. This includes the land, soil and water resources SEA topic if the historic landfill site is found to include contaminated material.

Regarding the historic environment SEA topic, major negative long-term significant effects are predicted because this option will could lead to the damage of listed buildings in the vicinity of ODU 5 as a result of flooding. For example, listed buildings within the flood zones in the future could include the Whitehall Grade II listed building and the Bandstand Grade II listed building in the Quomps recreation ground. Place Mill Grade II* listed building at the eastern end of the unit on the boundary with ODU 6 could also be impacted by flooding, although this building has a functional relationship with the water. The south-western boundary of the scheduled monument 'Pre-conquest monastery, early Christian cemetery, Augustinian priory and a motte and bailey castle at Christchurch' may also be impacted by flooding, although the land here rises quickly so areas landward of the boundary would not be expected to be at risk.

Option 2

Under Option 2 (Do Minimum), only small-scale patch-repair maintenance of the existing defences would be carried out as and when required. This would extend the service life of the existing defences, but only by several years at most. Therefore, the effects would be expected to be similar to Option 1 (Do Nothing), and this is reflected in the assessment findings.

Option 3

Under Option 3 (Maintain), the existing quay wall and raised defences would be routinely refurbished, beginning in epoch 1. This would likely protect properties in this location from flooding to a greater degree than Options 1 (Do Nothing) and 2 (Do Minimum). However, over time, as sea level rises, the standard of protection of the raised defences would fall and flooding to large numbers of properties would be expected to occur. Therefore, this option could lead to minor negative significant effects across a range of SEA topics. It would however reduce the risk of erosion to the historic landfill sites, and therefore minor positive significant effects are predicted under the land, soil and water resources SEA topic.

Option 4 and Option 7

Under Options 4 (Sustain A) and 7 (Improve A), a new frontline wall would be constructed in the western part of the unit. In addition, the existing setback wall, in the eastern part of the ODU, would be raised and lengthened. The existing frontline quay wall, also in the eastern part of the ODU, would be maintained / refurbished to prevent erosion of the historic landfill site. In this respect, these options provide new and improved defences where they are most needed, in the western part of the ODU where numerous properties border the northern bank of the River Stour. At the same time, these options provide continued erosion protection to the Quomps playing field and historic landfill site in the eastern part of the ODU, as well as the properties to the north of this area. Due to this, major positive long-term significant effects are predicted under the majority of the SEA topics.

With respect to the biodiversity and geodiversity SEA topic, there are potential opportunities for the defences to improve biodiversity and deliver BNG. For example, the refurbished / new frontline walls could be ecologically engineered and constructed using materials and features that provide important habitats. Likewise, any setback structures could include habitat areas / planting to encourage biodiversity in the area. These opportunities should be investigated during further appraisal /design following the Strategy. Generally, in this location there is sufficient space to construct within or close to existing defence footprints, and therefore direct encroachment / habitat loss into the marine SPA designation would be limited. Mitigation during construction would be required, for example, by not undertaking construction during the sensitive bird seasons.

Regarding the historic environment SEA topic, minor positive significant effects are predicted. These options provide protection to some of the listed buildings in the vicinity of the ODU, such as the Whitehall Grade II listed building and 56, 58 and 60 Sopers Lane Grade II listed buildings (otherwise at risk from extreme events in the future). However, these options do not provide improved flood protection to the grade II listed building 'Bandstand in Quomps recreation ground', the grade II* listed building 'Place Mill' and the grade II listed 'Place Mill Bridge'. However, it is recognised that 'Place Mill' and 'Place Mill Bridge' have a functional relationship with the water, and therefore they may not need to be defended in their entirety. This should be considered in more detail during the scheme design phase. Subject to the defence alignment and tie-in location with higher ground (which will be investigated further during scheme design), there may be a flood risk benefit to the south-west boundary of the scheduled monument 'Pre-conquest monastery, early Christian cemetery, Augustinian priory and a motte and bailey castle at Christchurch'.

Option 5 and Option 8

Under Options 5 (Sustain B) and 8 (Improve B), a new frontline sheet pile wall would be constructed along the full length of the ODU, which would provide a frontline flood defence to the unit. Similar effects and opportunities would be expected as those under Options 4 (Sustain A) and 7 (Improve A), and this is reflected in the assessment findings.

It is noted that these options are the only options that provide improved flood protection to grade II listed building 'Bandstand in Quomps recreation ground'. The eastern tie-in location is currently uncertain and would need to be determined during scheme design, but there is potential for these options to provide some protection to grade II* listed building 'Place Mill' and grade II listed 'Place Mill Bridge'. As mentioned above, 'Place Mill' and 'Place Mill Bridge' have a functional relationship with the water and therefore they may not need to be defended in their entirety. Nevertheless, it is recognised that the new frontline sheet pile wall may impact on the historic significance, fabric and setting of 'Place Mill' and 'Place Mill Bridge', and therefore this should be considered in more detail during the scheme design phase and mitigation agreed accordingly. Due to this, uncertainty is noted under this SEA topic.

Option 6 and Option 9

Under Options 6 (Sustain C) and 9 (Improve C), a new setback wall would be constructed in the western part of the ODU. In the eastern part of the ODU, the existing setback would be raised and length over time. Existing frontline quay walls would be maintained / refurbished as part of this option.

In the western part of the ODU, the new setback wall would be constructed landward of the properties immediately at risk in this location. Therefore, the flood risk associated benefits would not be as great as under Options 4 and 5 and 7 and 8. This is reflected in the assessment findings, with only minor positive significant effects predicted under the climate change, historic environment, and transport and movement SEA topics.

As with Options 4 and 7, only minor positive significant effects are predicted under the historic environment SEA topic because these options do not provide improved flood protection to the grade II listed building 'Bandstand in Quomps recreation ground', the grade II* listed building 'Place Mill' and the grade II listed 'Place Mill Bridge'. However, it is recognised that 'Place Mill' and 'Place Mill Bridge' have a functional relationship with the water, and therefore they may not need to be defended in their entirety. This will be considered in more detail during the scheme design phase.

Uncertainty is noted under the population and communities SEA topic given the potential for increased flood risk over time (due to sea level rise) in the western part of the unit, seaward of the new setback defence. Whilst this area would have property level protection, it is unclear how effective this may be in the long-term in this location.

The biodiversity and geodiversity SEA topic is predicted to lead to the same effects as Options 4, 5, 7 and 8, and similar opportunities for BNG exist under these options. This is reflected in the assessment findings.

Option 10

Similar impacts to Maintain are expected. Flood risk would be managed on a property by property basis but risk would still increase over time across the wider public realm.

All Options

Uncertainty is noted under the landscape SEA topic across all nine options. This is because the impact of the options on landscape is currently difficult to predict. Options 4-9 would require higher defences than there are currently, and if traditional construction techniques are used, this could have a negative effect on the landscape. However, techniques such as glass topped floodwalls or broader landscaped areas could be included as part of the design, which could limit negative effects, and even improve the landscape in some parts of the unit. With frontline defences in the east part of the unit in particular, there is ample space available to incorporate broad landscape features into the defence alignment.

### 10.3.1 Cumulative effects

The options under ODU 5 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location is already developed, and the undeveloped land is either within Flood Zone 3 or covered by a historic landfill site.

Potential cumulative effects with the Lower Stour Flood Risk Management Strategy that is currently being prepared by the Environment Agency have been considered. The project teams have engaged in regular dialogue throughout the development of the projects. It is understood from the Lower Stour project team that no major interventions to manage flood risk in the vicinity of ODU 5 are being proposed as part of the Lower Stour Strategy and therefore cumulative effects on environmental receptors in ODU 5 should be minimal. Any cumulative effects on environmental receptors upriver arising from options in ODU 5 are also likely to be minimal given the downstream location and nature of the flood cell.

## 10.4 Leading Option selection

Three Leading Options were selected for ODU 5 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve D-F.
- Local Aspirational Option: Improve A-C.
- Backup: Adaptation / Resilience.

Delivery of the National or Local Aspirational Options (Improve A-F) is likely to lead to environmental benefits across a range of SEA topics, as indicated by the SEA. Each of these options has potential to deliver BNG and opportunities will be investigated during further appraisal / design work. However, at this stage funding is uncertain for the Improve options, and if funding cannot be achieved the Backup option (Adaptation / Resilience) would be delivered.

Appropriate monitoring and mitigation will be required with either the National or Local Options to address any negative environmental effects. For example, for the historic environment SEA topic it will be important for scheme design to consider solutions that are in keeping with the character and setting of the conservation areas and listed buildings, making use of appropriate design materials and defence alignments.

# 11. SMZ 2 – ODU 6: River Avon West Bank options assessment

## 11.1 Introduction

ODU 6 (shown in **Figure 11.1** below) spans the western bank of the River Avon, from Quay Road (just to the east of the Quomps) to Knapp Mill. The ODU includes the Millstream. There are several defence sections in this ODU, including a concrete seawall, masonry walls, a sheet pile wall, gabions and a natural verge.

Between 35-40 properties are expected to be at risk from a present day 1 in 200-year event in this ODU, increasing to over 120 properties in 100 years' time. Over the next 100 years, the total PV damages for this ODU are estimated to be over £7.4million.

Given the numerous private landowners in this location, for a flood risk mitigation scheme to be successful, there will need to be collaboration between land owners, owners of any private defences and the flood risk authorities.

The area is not covered by an SMP policy. However, within the Hampshire Avon Catchment Flood Management Plan (CFMP) (2012)[36], ODU 6 falls within the 'Christchurch Area', in which the plan is to take further action to reduce flood risk, subject to additional appraisal.

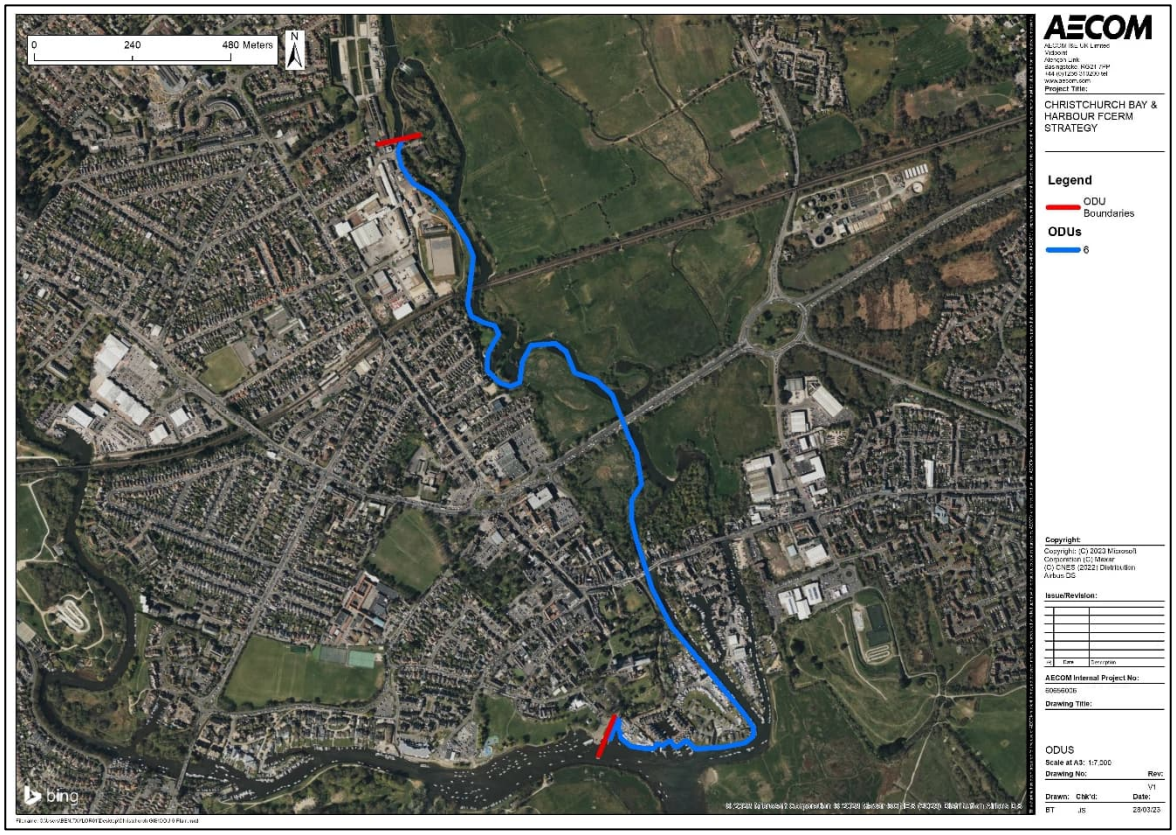


**Figure 11.1 ODU 6**

## 11.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences. Ensure health and safety compliance when defences fail.

[36] Environment Agency (2012) Hampshire Avon Catchment Flood Management Plan [online]. Available to access via this link

2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Sustain A**: construct a new frontline / setback defence in the southern part of the unit (epoch 1) at Priory Quay and Convent Meadows. This would be raised over time to keep pace with sea level rise (epochs 2 and 3). In the central part of the unit in proximity to Castle Street, construct a new defence, raised over time to keep pace with sea level rise (epochs 2 and 3).
5. **Sustain B**: construct a new frontline / setback defence in the central part of the unit (epoch 1) in proximity to Castle Street and then raise it over time to keep pace with sea level rise (epochs 2 and 3). In the south part of the unit implement property level protection throughout appraisal period to properties at risk from flooding, but no new raised defences here.
6. **Improve A**: as per Sustain A, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).
7. **Improve B**: as per Sustain B, except the defences are constructed to the full height and length initially (e.g. no new construction in epochs 2 and 3).
8. **Adaptation / Resilience**: implement property level protection to the properties at risk from flooding throughout the appraisal period, mainly focussed in the south (Priory Quay / Convent Meadows) and central part (Castle Street) of the unit. Consider natural flood management where adjacent land is not residential.

# 11.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 11.1** below and discussed in more detail underneath.

### Table 11.1 Assessment findings for ODU 6

| | Option number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| Biodiversity and geodiversity | ? | ? | 0 | - | - | - | - | 0 |
| Climate change | -- | -- | -- | ++ | + | ++ | + | - |
| Landscape | ? | ? | ? | - | - | - | - | ? |
| Historic environment | -- | -- | -- | - | - | - | - | - |
| Land, soil and water resources | ? | ? | ? | ? | ? | ? | ? | ? |
| Population and communities | -- | -- | -- | ++ | + | ++ | + | - |
| Transport and movement | -- | -- | -- | ++ | + | ++ | + | - |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The River Avon SAC[37], Avon Valley SPA/ Ramsar site, River Avon System SSSI[38], and Avon Valley (Bickton to Christchurch) SSSI[39] run adjacent to the majority of the length of the ODU, all covering the River Avon. The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

This stretch of the River Avon System SSSI is covered by unit 56 (Hampshire Avon Lower (downstream Fordingbridge)). This unit is currently in an unfavourable condition because this part of the river fails to achieve favourable conditions for all six attributes assessed, covering a wide range of condition indicators. Many of these indicator failures are linked with nutrient eutrophication and river channel modification.

This stretch of the Avon Valley (Bickton to Christchurch) SSSI is covered by unit 154 (open running water – River Avon). This unit is currently in an unfavourable but recovering condition. Of particular concern is the decline of Desmoulin' whorl snail. However, the status of the other two molluscs found in this part of the SSSI is currently unknown. In addition, Salmon populations are below the conservation limit and considered to be at risk. It is noted that this may be due to external factors, such as survival at sea and climate change, causing higher river temperatures, as well as the riverine habitat.

In terms of BAP priority habitats, this ODU contains an area of coastal and floodplain grazing marsh, located where the A35 (Christchurch Bypass) crosses the river, as well as a small area of deciduous woodland.

In terms of flood risk, a large part of the western bank of the River Avon is within Flood Zone 3, particularly near the southern border of the ODU, as well as where the A35 crosses the River Avon. Numerous properties border the western bank of the River Avon, including part of Christchurch town centre. There is also an industrial estate near the northern boundary of the ODU. The area where the A35 crosses the river comprises open green space. Several roads pass near the western boundary of the River Avon, including Quay Road, Covent Walk, Castle Street, the A35, and Mill Road.

The ODU primarily falls within the New Forest[40] National Character Area (NCA), which includes the Lower Hampshire Avon Valley. However, the southern boundary of the ODU falls within the Dorset Heaths[41] NCA, which today contains some of the best lowland heath left in England.

With regards to the historic environment, the southern boundary of the ODU borders one grade II* listed building and one grade II listed building at Place Mill. Scheduled monument 'Pre-conquest monastery, early Christian cemetery, Augustinian priory and a motte and bailey castle at Christchurch' is also adjacent to the southern boundary of the ODU, spanning a large area to Castle Street in the north. Notably, the schedule monument contains several listed buildings, including three grade I listed buildings. In addition, there are two grade I listed buildings on Castle Street, 'Redford Bridge' and 'Town Bridge', which pass over Mill Stream and the River Avon respectively. Further to the north, where the railway line crosses the River Avon, is scheduled monument 'World War II pillbox and tank traps in former railway yard north of town', 60m west of the western bank of the River Avon.

With regards to land, soil and water resources, the northern part of the ODU falls within the Hampshire Avon (Lower) drinking water protected area (surface water).

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of quay walls. With projected sea level rise, the risk of flooding in this location is expected to increase over time. Notably, between 35-40

[37] JNCC (no date): 'River Avon', [online] available to access via this link
[38] Natural England (no date): 'River Avon System SSSI', [online] available to access via this link
[39] Natural England (no date): 'Avon Valley (Bickton to Christchurch) SSSI', [online] available to access via this link
[40] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link
[41] Natural England (2013): 'NCA Profile: Dorset Heaths (NE506)', [online] available to access via this link

properties are currently at risk of flooding from a 1 in 200-year event, and over 120 properties are expected to be at risk in 100 years' time. Therefore, major negative long-term significant effects are considered likely across the majority of the SEA topics, as flood risk would not be managed or reduced in the future.

Regarding the historic environment SEA topic, major negative long-term significant effects are predicted because this option is likely to lead to flooding of listed buildings in the vicinity of this ODU. There is potential for more regular flooding with sea level rise in the future, particularly in the area around Castle Street where there is a high concentration of listed buildings. The scheduled monument 'Pre-conquest monastery, early Christian cemetery, Augustinian priory and a motte and bailey castle at Christchurch' could also be at risk. The vast majority of this scheduled monument is located on higher ground, above the projected flood zones. However, flooding around the boundary of the monument could occur, as well as to isolated areas of higher risk in the north-east corner of the monument, around the Constable House Grade I listed building and adjacent to Castle Steet, and the south-west corner of the monument, adjacent to ODU 5 (appraised in ODU 5). These areas that are around the boundary to the scheduled monument and the north-east and south-west corner are presently at risk from a 1 in 2 year flood event and have no mitigation in place, however, the frequency and depth of flooding is likely to increase in the future if nothing is done to manage the risk.

Under the Do Nothing option, once existing quay walls fail in the future, this option could also lead to instability of ground adjacent to the walls potentially impacting listed buildings and the boundary of the scheduled monument 'Pre-conquest monastery, early Christian cemetery, Augustinian priory and a motte and bailey castle at Christchurch'.

Option 2 and Option 3

Under Option 2 (Do Minimum) and Option 3 (Maintain), patch repairs / maintenance of the existing quay walls would be carried out as and when required. Given that there a no formal raised defences in this unit, this is not likely to improve the flood risk, and therefore the effects across the SEA topics for these options would be similar to Option 1 (Do Nothing).

The effect on biodiversity and geodiversity under Option 3 (Maintain) is predicted to be neutral given that it only involves maintaining existing quay walls in their current position. This is reflected in the assessment findings.

Option 4 and Option 6

Under Options 4 (Sustain A) and 6 (Improve A), new defences would be constructed in ODU 6. Indicative defence alignments for these options have been developed for the Strategy and include defences in both the southern and central parts of the ODU. The indicative defence alignments for these options are not final and would require further appraisal during scheme design. The indicative alignments were identified primarily for the purposes of costing and supporting the economic appraisal, and therefore are primarily focussed around defending residential and commercial properties as this is the key driver of FCERM GiA funding. The indicative alignments that have been assumed defend the area of highly concentrated listed buildings in the Castle Street area. However, they do not include defences for the area around the scheduled monument 'Pre-conquest monastery, early Christian cemetery, Augustinian priory and a motte and bailey castle at Christchurch' given that this area is generally higher ground and only the boundary of the site and a small number of properties are at risk in this location. Should either of these options be taken forward, it is recommended that the defence alignments are further appraised and opportunities for defending the scheduled monument area are considered to determine if this would be feasible from a technical, economic and environmental perspective.

For Options 4 and 6, major positive long-term significant effects are predicted under the majority of SEA topics, including climate change, population and communities, and transport and movement. With respect to the biodiversity and geodiversity SEA topic, both options are predicted to lead to minor negative significant effects. This is because both options would involve construction in proximity to environmental designations and habitats, such as the River Avon SAC, Avon Valley SPA / Ramsar, and River Avon System SSSI. In the northern part of the unit in particular, there are space constraints which increases the likelihood of new defences being located seaward of the existing defence alignment. This would need to be determined during further design / appraisal following the Strategy if either of these options were taken forward. However, for the purposes of the SEA, it has conservatively been assumed that these options could lead to some encroachment into the designated areas and some habitat loss may occur.

Regarding the historic environment SEA topic, based on the defence alignments that have been assumed and used in the appraisal, the new defences in the central parts of the ODU would protect a large cluster of listed

buildings in this location from flooding around the Castle Street area. However, the options would not provide protection to the listed buildings to the south of Castle Street, including grade I listed 'The Constable's House', which is situated in a depression behind the Millstream wall. In addition, the boundary of the scheduled monument 'Pre-conquest monastery, early Christian cemetery, Augustinian priory and a motte and bailey castle at Christchurch' would remain vulnerable to flooding, particularly at the north eastern boundary which is left undefended under the assumed alignments. Due to this, minor negative long-term significant effects is noted under this SEA topic. However, there is potential to explore different alignments during scheme development if this option were to be taken forward, and opportunities to incorporate the listed buildings and scheduled monument into the defence area could be considered.

New defences as part of this option could be in excess of 1m high and could impact on the landscape and views of the area. Therefore, minor negative significant effects are predicted under the landscape SEA topic.

Option 5 and Option 7

Under Options 5 (Sustain B) and 7 (Improve B), new defences would be constructed in the central part of the ODU. However, property-level protection would be implemented in the southern part of the ODU. These options perform less favourably than Options (Sustain A) and 6 (Improve A), as the level of flood defence provided by the property level protection to the properties in the southern part of the unit would be to a lower standard of protection. In addition, public spaces and transport links would not be defended from flooding in the southern part of the unit. This is reflected in the assessment findings, with only minor positive significant effects predicted under the climate change, population and communities, and transport and movement SEA topics.

Predicted effects under the biodiversity and geodiversity, landscape and historic environment SEA topics for these options are similar to those predicted for Options 4 and 6.

Option 8

Under Option 8 (Adaptation / Resilience), property level protection would be implemented in the southern and central parts of the unit. However, the property level protection would not provide a high standard of protection (deep flooding could still cause flood damage to properties with property level protection). Furthermore, no new permanent raised defences would be constructed, and therefore public spaces and transport links would not be defended from flooding in the southern and central parts of the unit. This is reflected in the assessment findings, with minor negative significant effects predicted across several SEA topics.

The option is expected to lead to minor negative significant effects under the historic environment SEA topic because listed buildings and the boundary to the scheduled monument would remain vulnerable to flooding which could lead to damage. Property level protection measures would be used to reduce the risk of damage to the listed buildings where possible, but given the historic nature of these assets, care will be required to ensure the property level protection is appropriate. If traditional property level protection measures such as flood gates and waterproofing are not viable, then bespoke / alternative methods could be utilised depending on the structure characteristics, setting and building fabric. This could even involve localised hard defences such as new flood walls to individual properties, but it is likely that more expensive measures such as this would need to be funded by the property owner or other stakeholders. This is because the additional costs associated with these bespoke defence measures could mean that the option as a whole becomes unviable from an economic standpoint (i.e. benefit cost ratio less than 1) and therefore the bespoke defences would not be eligible for funding from FCERM GiA or other public funding pots.

Maintenance and refurbishment of the existing quay walls would be undertaken as part of this option which reduces the risk of land instability in the future. This would help to ensure the integrity of the buildings close the water's edge and the boundary to the scheduled monument.

Neutral effects are predicted under the biodiversity and geodiversity SEA topic, which is the same as Option 3 (Maintain), given that existing quay walls would be maintained with the same approach, and property level protection would not be expected to impact biodiversity and geodiversity. There is potential for noise / vibration impacts to habitats / species under this option, associated with maintenance of the quay walls / installation of PLP. Appropriate mitigation, such as undertaking works away from sensitive bird /species seasons, would need to be undertaken to limit this impact.

All Options

Uncertainty is noted under the land, soil and water resources SEA topic across all eight options. Whilst the land in this location is not used for agricultural purposes, nor are there any historic landfill sites in this location, the northern part of the ODU falls within the Hampshire Avon (Lower) drinking water protected area (surface water).

### 11.3.1 Cumulative effects

The options under ODU 6 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location is already developed, and the undeveloped land is within Flood Zone 3.

Potential cumulative effects with the Lower River Avon Strategy that is currently being prepared by the Environment Agency have been considered. The two project teams have engaged in regular dialogue throughout the development of the projects. It is understood from the Lower River Avon project team that no major interventions to manage flood risk in the vicinity of ODU 6 are being proposed as part of the Lower River Avon Project and therefore cumulative effects on environmental receptors in ODU 6 should be minimal. Any cumulative effects on environmental receptors upriver arising from options in ODU 6 are likely to be minimal given the downstream location and nature of the flood cell.

It is also recognised that the options under ODU 7 that involve raising of defences at Rossiter's Quay, on the opposite bank of the river, could have implications for fluvial flood risk in ODU 6. This would need to be investigated at the scheme level. Given that the Rossiters Quay area is already surrounded by quay walls and a flood defence and is of a relatively small area, any impacts would be anticipated to be minor, but require further assessment during scheme appraisal.

## 11.4 Leading Option selection

One Leading Options was selected for ODU 6 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Adaptation / Resilience

There are likely to be negative environmental effects associated with the Adaptation / Resilience option. However, there is not an economic case to deliver any of the alternative Do Something options considered, and therefore the Adaptation / Resilience option is considered to be the most appropriate way forward in the context of the full appraisal that considers social, economic and environmental factors.

Due to economic constraints, the National Option doesn't include any new raised flood defences and therefore represents a continuation of the existing situation where many of the residential properties, historic assets and listed buildings are currently at risk of flooding with no mitigation in place. Where possible, this option will seek to deliver property level protection measures to reduce the risk of flooding on a property-by-property basis. This could include bespoke defence measures for individual properties and property owners will have the flexibility to seek bespoke solutions providing they meet consenting criteria. This includes for historic assets that may be at risk, such as Constable's House adjacent to the Mill Stream.

There are many designated and undesignated features in this area that are nationally important from a historic environment perspective for which traditional property level protection measures may not be appropriate. If the risk of flooding cannot be reduced, then appropriate resilience measures could be put in place to reduce the impact of flooding when it occurs. Resilience measures should depend on the building characteristics. Some examples of resilience measures may involve regular surveys to check for structural problems, post storm clean-up and drying, and implementation of flood response plans. Examples of mitigation for water compatible buildings could include a programme of survey work to identify the need for repairs on a regular basis and minor building adjustments to ensure water can exit quickly following flood events to improve drying.

It is beyond the scope of the Strategy to determine potential impacts of flooding to individual heritage assets and archaeology and to design bespoke mitigation solutions on an asset by asset basis. It is therefore recommended that further work is undertaken prior to delivering a scheme in ODU 6. This should include a heritage impact assessment and archaeological assessment to better understand the how each heritage asset may be impacted by increased flood risk. This should be followed by a scheme level option heritage appraisal study to explore options for mitigation on an asset by asset basis. The heritage option appraisal study should consider funding availability and devise a funding strategy so that any proposed solutions are realistic and achievable. In the

interim it recommended that monitoring is carried out to assess damage following flood events. This may need to be continued following a scheme in this location depending on its extent.

# 12. SMZ 2 – ODU 7: Rossiters Quay options assessment

## 12.1 Introduction

ODU 7 (shown in **Figure 12.1** below) covers the Rossiters Quay island in the middle of the River Avon. Defences in this ODU consist of natural verges, embankment and masonry walls. There are also a large number of flood gates in this ODU. Notably, many properties are located close to the water's edge and therefore there is generally a lack of space to construct new defences. Given the numerous private landowners in this location, for a flood risk mitigation scheme to be successful, there will need to be collaboration between the numerous land owners and the flood risk authorities.

Access to the river, as well as to the natural creek (Brigands Creek) running through the defences in the north eastern corner of the island, is a key issue to consider.

Over 50 properties are expected to be at risk from a 1 in 200 year event in 100 years' time. Over the next 100 years, the total PV damages for this ODU are estimated to be £5.4million.

Similar to ODU 6, this area does not have an SMP policy as it is not included within the SMP. However, within the CFMP (2012)[42] the unit falls within the 'Christchurch Area', in which the plan is to take further action to reduce flood risk, subject to additional appraisal.


**Figure 12.1 ODU 7**

[42] Environment Agency (2012) Hampshire Avon Catchment Flood Management Plan [online]. Available to access via this link

# 12.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Sustain A**: construct new defences (epoch 2) consisting of a setback defence and a new quay wall with a raised front wall; raise the defences over time to keep pace with SLR (epoch 3).
5. **Improve A**: as per Sustain A, except the defences are constructed to the full height initially and not raised over time (e.g. no new construction in epoch 3).
6. **Adaptation / Resilience**: implement property level protection to the properties at risk from flooding throughout the appraisal period and maintain existing defences.

# 12.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 12.1** below and discussed in more detail underneath.

### Table 12.1 Assessment findings for ODU 7

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** |
| Biodiversity and geodiversity | ? | ? | ? | - | - | ? |
| Climate change | -- | -- | - | + | + | - |
| Landscape | ? | ? | ? | - | - | ? |
| Historic environment | -- | -- | - | + | + | - |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | + | + | - |
| Transport and movement | -- | -- | - | + | + | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

This ODU is surrounded by the River Avon SAC[43], the Avon Valley SPA/ Ramsar site, the River Avon System SSSI[44], and the Avon Valley (Bickton to Christchurch) SSSI[45]. The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

This stretch of the River Avon System SSSI is covered by unit 56 (Hampshire Avon Lower (downstream Fordingbridge)). This unit is currently in an unfavourable condition because this part of the river fails to achieve favourable conditions for all six attributes assessed, covering a wide range of condition indicators. Many of these indicator failures are linked with nutrient eutrophication and river channel modification.

This stretch of the Avon Valley (Bickton to Christchurch) SSSI is covered by unit 154 (open running water – River Avon). This unit is currently in an unfavourable but recovering condition. Of particular concern is the decline of Desmoulin' whorl snail. However, the status of the other two molluscs found in this part of the SSSI is currently unknown. In addition, Salmon populations are below the conservation limit and considered to be at risk. It is noted that this may be due to external factors, such as survival at sea and climate change causing higher river temperatures, as well as the riverine habitat.

In terms of BAP priority habitats, the northern part of the ODU contains deciduous woodland. There is also a small slither of coastal saltmarsh along the eastern boundary of the southern part of the ODU.

In terms of flood risk, almost the entire ODU is within Flood Zone 3. The quay contains numerous properties, as well as the Avon Marina. Bridge Street and Avon Wharf are the only roads on the quay.

The ODU falls within the New Forest[46] National Character Area (National Character Area (NCA), which includes the Lower Hampshire Avon Valley.

With regards to the historic environment, Bridge Street, which intersects with the ODU, is lined by several listed buildings, including two grade II*. Moreover, Town Bridge, which connects the quay to the west, is grade I listed, as is Waterloo Bridge, which connects the quay to the east. The entire ODU is covered by Christchurch Central Conservation Area.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Due to this, the existing defences are likely to fail over time, and when combined with sea level rise, this would increase the risk of flooding in this location. Notably, only two properties are currently at risk of flooding from a present day 1 in 200-year event due to the existing raised defences; however, over 50 properties would be expected to be at risk in 100 years' time under this option. Therefore, major negative long-term significant effects are predicted across the majority of the SEA topics, including climate change, the historic environment, population and communities, and transport and movement.

Regarding the historic environment SEA topic, major negative long-term significant effects are predicted because this option would leave the listed buildings along Bridge Street at risk of damage from flooding.

Option 2

Under Option 2 (Do Minimum), only small-scale patch-repair maintenance of the existing defences would be carried out as and when required. This is likely to extend the service life of the existing defences by up to several years. However, in the medium- and long-term the defences would not be replaced when they reach the end of their service life, and therefore the flood risk would be similar to Option 1 (Do Nothing). This is reflected in the assessment findings.

Option 3

Under Option 3 (Maintain), existing defences would be routinely refurbished, beginning in epoch 1 and continuing throughout the appraisal period. This would help to reduce the risk of the existing raised defences failing, and therefore the risk of flooding relative to Options 1 (Do Nothing) and 2 (Do Minimum) would be reduced. However, the defences would not be raised, and due to sea level rise, the flood risk would increase over time compared to

[43] JNCC (no date): 'River Avon', [online] available to access via this link
[44] Natural England (no date): 'River Avon System SSSI', [online] available to access via this link
[45] Natural England (no date): 'Avon Valley (Bickton to Christchurch) SSSI', [online] available to access via this link
[46] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link

the present day. Minor negative significant effects are therefore predicted across the climate change, historic environment, population and communities, and transport and movement SEA topics.

Uncertainty is noted under the biodiversity and geodiversity SEA topic, as there is uncertainty as to whether defences could be refurbished within their existing defence footprint (this will need to be investigated further during further appraisal / design work following the Strategy).

Option 4 and Option 5

Under Options 4 (Sustain A) and 5 (Improve A), new / upgraded raised defences would be constructed. This would provide a high standard of protection against flooding to the central portion of the quay, where the majority of properties/ listed buildings are located. However, this will not protect the properties in the south eastern extent of the quay, or the Avon Marina. Due to this, only minor positive long-term significant effects are predicted across the majority of the SEA topics. This includes the historic environment SEA topic, as listed buildings along Bridge Street will be protected from flooding. However, it is noted that the design of the new / upgraded raised defences should seek to conserve the character of the conservation area and the setting of the listed buildings within it, taking particular care at interfaces with designated heritage assets, including grade I listed 'Town Bridge' and 'Waterloo Bridge'.

There is generally a lack of space to construct new defences in this ODU as part of Options 4 (Sustain A) and 5 (Improve A). The aim during design / construction would be to make use of existing defence footprints to minimise any encroachment into the adjacent designations and habitats, such as the River Avon SAC, Avon Valley SPA / Ramsar, various SSSIs, and BAP deciduous woodland habitat. However, there is uncertainty around this, and in some locations a small amount of encroachment / habitat loss may be unavoidable, which could lead to minor negative significant effects under the biodiversity and geodiversity SEA topic due to habitat loss. The design of the structures will be undertaken at the next stage of appraisal, and therefore there is considerable uncertainty as to whether habitat loss may occur. There could be viable alternatives, such as using existing defence structure foundations, or incorporating existing building walls into part of the defence system. Minor negative significant effects have therefore been predicted under the biodiversity and geodiversity SEA topic for both of these options, but a degree of uncertainty is noted. This area / option has been screened in during the HRA screening process (potential for an LSE) for further consideration during the next stage of the process.

Option 6

Under Option 6 (Adaptation / Resilience), property level protection would be implemented to properties at risk of flooding in this unit, and existing defences / quay walls would be refurbished / maintained. However, the property level protection would not provide a high standard of protection (deep flooding could still cause flood damage to properties with property level protection). Furthermore, no new permanent raised defences would be constructed, and therefore public spaces and transport links would not be defended from flooding. This is reflected in the assessment findings, with minor negative significant effects predicted across a range of SEA topics. This includes the historic environment SEA topic, as listed buildings along Bridge Street would remain vulnerable to damage from flooding.

Uncertainty is noted under the biodiversity and geodiversity SEA topic, as there is uncertainty as to whether defences could be refurbished within their existing defence footprint (this will need to be investigated further during further appraisal / design work following the Strategy).

All Options

Neutral effects are predicted under the land, soil and water resources SEA topic across all six options because they are unlikely to impact these resources. This is because the land in this location is not used for agricultural purposes, nor are there any historic landfill sites, drinking water protected areas/ safeguard zones, or source protection zones in this location.

## 12.3.1 Cumulative effects

The options under ODU 7 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location is already developed, and the undeveloped land is covered by deciduous woodland.

Potential cumulative effects with the Lower River Avon Strategy that is currently being prepared by the Environment Agency have been considered. The two project teams have engaged in regular dialogue throughout

the development of the projects. It is understood from the Lower River Avon project team that no major interventions to manage flood risk in the vicinity of ODU 7 are being proposed as part of the Lower River Avon project and therefore cumulative effects on environmental receptors in ODU 7 should be minimal. Any cumulative effects on environmental receptors upriver arising from options in ODU 7 are likely to be minimal given the downstream location and nature of the flood cell.

It is also recognised that the options under ODU 7 that involve raising of defences at Rossiter's Quay could have implications for flood risk in ODU 6, on the opposite bank of the river but this will be investigated further during scheme design. The impact would be expected to be minor if any, given that ODU 7 is already surrounded by a quay wall / raised defences.

## 12.4 Leading Option selection

Two Leading Options were selected for ODU 7 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve A.
- Backup: Adaptation / Resilience.

Delivery of the National Economic Option (Improve A) is likely to lead to environmental benefits in the climate change, historic environment, transport and movement and population categories as indicated by the SEA. However, it is noted that the design of the new / upgraded raised defences should seek to conserve the character of the conservation area and the setting of the listed buildings within it, taking particular care at interfaces with designated heritage assets, including grade I listed 'Town Bridge' and 'Waterloo Bridge'. Funding for the National Economic option is uncertain and if funding cannot be achieved the Backup (Adaptation / Resilience) would be delivered.

# 13. SMZ 2 – ODU 8: River Avon East Bank options assessment

## 13.1 Introduction

ODU 8 spans 1.1km along the eastern bank of the River Avon, from Knapp Mill to Christchurch Bypass. The eastern bank of the River Avon in this ODU is characterised by open space/ natural floodplain. The defence along the eastern bank of the River Avon in this ODU is a natural verge. It does not have a condition grade assigned and is privately maintained.

As outlined in the Leading Option Report (AECOM, 2023), options in ODU 8 have not been appraised fully as part of the Strategy as it was agreed that options for managing the flood risk would be developed as part future projects on the Lower River Avon.

No further details are therefore provided in the SEA for the potential environmental effects of options in ODU 8.

# 14. SMZ 2 – ODU 9: Stanpit options assessment

## 14.1 Introduction

ODU 9 (shown in **Figure 14.1** below) covers the eastern bank of the River Avon and the northern side of Christchurch Harbour, from the A35 to Stanpit Marsh car park. Existing defences comprise a natural verge, earth embankment, masonry wall and sheet pile wall, as well as a large number of flood gates.

The management of the historic landfill site in this ODU is a key driver for options, as erosion of the site in the short-term has potential to lead to environmental impacts. Other key factors include the continued importance of access to the river and potential future development. It may be difficult to build a robust economic case for this ODU due to the long length of defence required.

There are properties at risk from flooding in this unit. However, the risk does not increase substantially until later on in the appraisal period. In 100 years' time, it is expected that over 850 properties will be at risk from a 1 in 200-year tidal flood event. Over the next 100 years, the total PV damages for this ODU are estimated to be over £39 million.

In the SMP[47], the area around Stanpit has a 'Hold the Line' policy in the short-term, followed by 'Managed Realignment' in the medium- and long-term. The SMP refresh recommended that the policy for this area is revisited/ amended to 'Hold the Line' for the medium- and long-term to facilitate any management measures considered necessary to defend the historic landfill site. The remainder of the ODU does not have an SMP policy as it is outside of the SMP area. However, it is included in the CFMP (2012) 'Christchurch Area', in which the plan is to take further action to reduce flood risk, subject to additional appraisal.

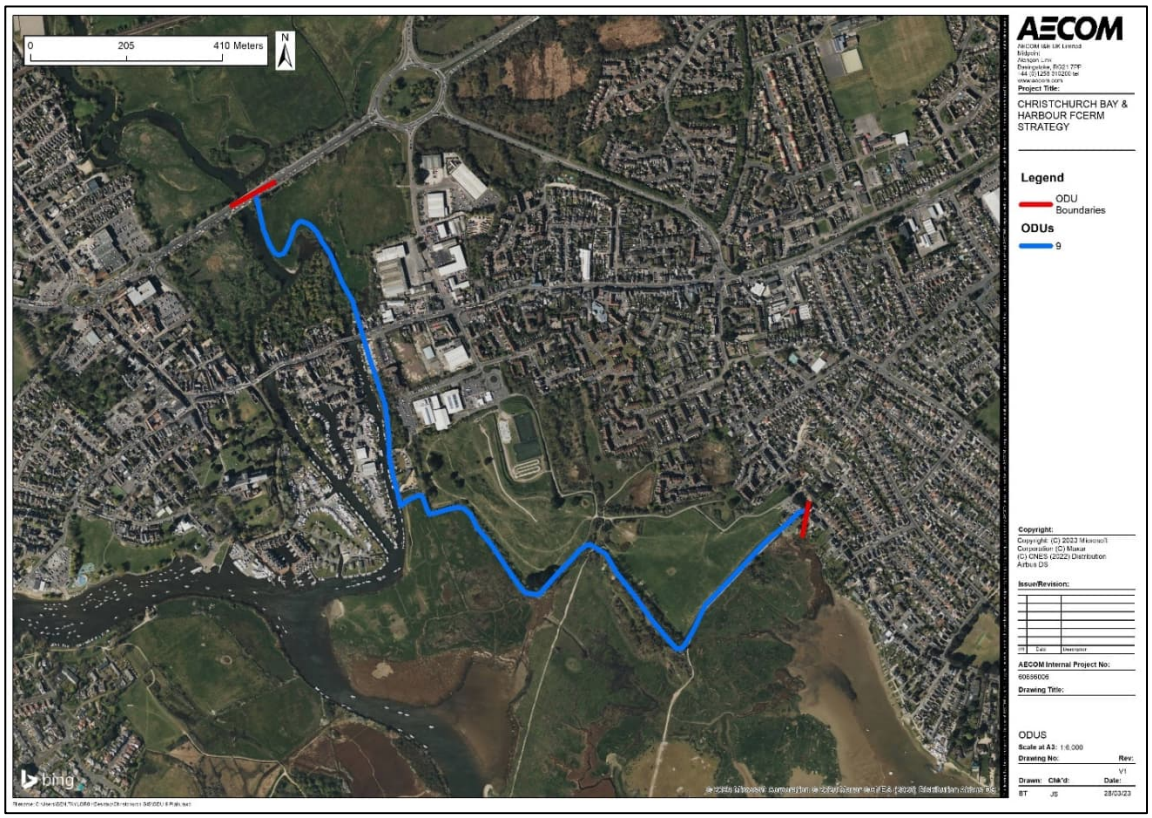


**Figure 14.1 ODU 9**

[47] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

# 14.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1), approximately every 25 years; construct armoured embankment around Stanpit historic landfill in epoch 2.
4. **Sustain A**: construct a new setback defence adjacent to the River Avon in the north part of the unit (epoch 2); construct new defence around Stanpit historic landfill (epoch 2); raise height of the defences over time to keep pace with SLR (epoch 3); aim to restore/ improve condition of the saltmarsh in front of the defences (epoch 1-3).
5. **Improve A**: as per Sustain A, except the defences are constructed to their full length and height when constructed; aim to restore/ improve condition of the saltmarsh in front of the defences (epochs 1-3).
6. **Adaptation / Resilience**: implement property level protection to the properties at risk from flooding throughout the appraisal period and maintain existing defences.

# 14.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 14.1** below and discussed in more detail underneath.

## Table 14.1 Assessment findings for ODU 9

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** |
| Biodiversity and geodiversity | ? | ? | 0 | ++ | ++ | 0 |
| Climate change | -- | -- | - | ++ | ++ | - |
| Landscape | ? | ? | ? | - | - | ? |
| Historic environment | -- | -- | - | + | + | - |
| Land, soil and water resources | -- | -- | + | ++ | ++ | + |
| Population and communities | -- | -- | - | ++ | ++ | - |
| Transport and movement | -- | -- | - | ++ | ++ | - |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

Approximately half of the length of the ODU, starting at the north western boundary, runs adjacent to the River Avon SAC[48], Avon Valley SPA/ Ramsar site, the River Avon System SSSI[49], and the Avon Valley (Bickton to Christchurch) SSSI[50]. Meanwhile, the other half of the length of the ODU, starting at the south eastern boundary, runs adjacent to the Christchurch Harbour SSSI[51] and Stanpit Marsh, Christchurch LNR. The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

Concerning the River Avon System SSSI, the ODU borders unit 56 (Hampshire Avon Lower (downstream Fordingbridge)). This unit is currently in an unfavourable condition because this part of the river fails to achieve favourable conditions for all six attributes assessed, covering a wide range of condition indicators. Many of these indicator failures are linked with nutrient eutrophication and river channel modification.

Concerning the Avon Valley (Bickton to Christchurch) SSSI, the ODU borders unit 154 (open running water – River Avon). This unit is currently in an unfavourable but recovering condition. Of particular concern is the decline of Desmoulin' whorl snail. However, the status of the other two molluscs found in this part of the SSSI is currently unknown. In addition, Salmon populations are below the conservation limit and considered to be at risk. It is noted that this may be due to external factors, such as survival at sea and climate change causing higher river temperatures, as well as the riverine habitat.

Concerning Christchurch Harbour SSSI, the ODU borders units 9 (Priory Marsh) and 11 (Stanpit Marsh), which are both currently in a favourable condition. The main habitat in unit 9 is neutral grassland (lowland), whilst in unit 11 it is littoral sediment. Notably, unit 11 is a nature reserve that is frequently visited by the public, containing extensive areas of saltmarsh plus smaller areas of brackish wet grassland, acidic grassland, reedbed and scrub.

In terms of BAP priority habitats, the ODU falls within/ adjacent to several habitats, including coastal and floodplain grazing marsh, coastal saltmarsh, reedbeds, and deciduous woodland.

In terms of flood risk, the northern part of the ODU is within Flood Zone 3, whilst the open green space (golf course and Stanpit Recreation Ground) in the southern part of the ODU is within Flood Zone 1. However, the area immediately to the south of the southern part of the ODU is within Flood Zone 3. Only the central part of the ODU, to the south of Bridge Street, borders properties, which are primarily industrial/ businesses. In addition to Bridge Street, the ODU lies close to Commercial Road.

The ODU falls within the New Forest[52] National Character Area (NCA), which includes the Lower Hampshire Avon Valley.

With regards to the historic environment, the part of the ODU that passes Rossiters Quay is adjacent to grade I listed Waterloo Bridge to the west, as well as a cluster of five grade II listed buildings to the east along Bridge Street. This part of the ODU is located within Christchurch Central Conservation Area. There is another cluster of grade II listed buildings further inland to the east, along Purewell Road, the closest of which is 250m from the eastern bank of the River Avon. In addition, the south eastern boundary of the ODU is near two grade II listed buildings on Stanpit Road. It is also noted that a Mesolithic occupation site is present at Mother Siller's Channel on Stanpit Marsh, which raises the possibility of other prehistoric and later sites.

In terms of land, soil and water resources, the golf course and Stanpit Recreation Ground comprise a large historic landfill site. The contamination status of the materials for much of the historic landfill site is unknown and site investigations would be required to confirm this. The potential impacts associated with the historic landfill site on the land, soil and water resources SEA topic are therefore uncertain.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Due to this, the existing defences are likely to fail over time, and when combined with sea level rise, the risk of flooding is expected to increase in this location. Notably, whilst there are some properties in the ODU currently at risk of flooding, in 100 years' time, over 850 properties would be expected to be at risk from a 1 in 200-year event. Therefore, major negative long-term significant effects are predicted across the majority of the SEA topics. This

[48] JNCC (no date): 'River Avon', [online] available to access via this link
[49] Natural England (no date): 'River Avon System SSSI', [online] available to access via this link
[50] Natural England (no date): 'Avon Valley (Bickton to Christchurch) SSSI', [online] available to access via this link
[51] Natural England (no date): 'Christchurch Harbour SSSI', [online] available to access via this link
[52] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link

includes the land, soil and water resources SEA topic if the historic landfill site is found to include contaminated material. The exception is the biodiversity and geodiversity SEA topic, where uncertainty is noted.

Regarding the historic environment SEA topic, major negative long-term significant effects are predicted because listed buildings will remain vulnerable to damage from flooding under this option.

Option 2

Under Option 2 (Do Minimum), only small-scale patch repair maintenance of the existing defences would be carried out as and when required. This is likely to extend the service life of the existing defences by up to several years. However, in the medium- and long-term, the defences would not be replaced when they reach the end of their service life, and therefore the flood risk would be expected to be similar to Option 1 (Do Nothing). This is reflected in the assessment findings.

Option 3

Under Option 3 (Maintain), the existing defences would be routinely refurbished, beginning in epoch 1. This would help to reduce the risk of the existing raised defences failing, and therefore the risk of flooding relative to Option 1 (Do Nothing) and Option 2 (Do Minimum) would be reduced. However, the defences would not be raised any further, and due to sea level rise, flood risk would increase over time compared to the present day. Minor negative significant effects are therefore predicted under the climate change, historic environment, population and communities, and transport and movement SEA topics. By maintaining the existing verge around Stanpit, this would help to reduce the erosion risk to the historic landfill site, and could therefore provide a benefit to the land, soil and water resources SEA topic.

Option 4 and Option 5

Under Options 4 (Sustain A) and 5 (Improve A), a new / upgraded defence would be constructed adjacent to the River Avon in the north western part of the ODU. Meanwhile, a new defence would be constructed around Stanpit historic landfill site in the south eastern part of the ODU. There would also be an aspiration to restore/ improve the saltmarsh in front of the defences in this location. This would provide BNG, as well as help attenuate waves in front of the defences. In this respect, these options provide a comprehensive set of defences, protecting the entire length of the ODU whilst positively contributing towards the biodiversity designations in this area. As a result, major positive long-term significant effects are predicted under the majority of the SEA topics.

Major positive significant effects are noted for Options 4 and 5 under the biodiversity and geodiversity and landscape SEA topics. With regards to biodiversity and geodiversity, there are significant potential positive benefits to biodiversity through saltmarsh restoration / enhancement, which would provide BNG and help the saltmarsh habitat adjust to sea level rise and climate change. Without this restoration / enhancement, there is a risk that the saltmarsh could be lost / damaged due to coastal squeeze in the future.

The new defences as part of these options would be constructed in close proximity to a number of environmental designations, such as the River Avon SAC, Avon Valley SPA / Ramsar, Solent and Dorset coast marine SPA, River Avon SSSI and Avon Valley SSSI. Generally, there is sufficient space to construct defences either setback or within the footprint of the existing defences, and therefore opportunities to limit encroachment / habitat loss of designated areas could be achieved through design. This would limit the impacts on these designated sites. Whilst there is potential for disturbance, such as noise and vibration during construction, these impacts would be temporary and appropriate mitigation would be required to limit the impact (such as avoiding construction during sensitive seasons for species).

Higher defences as part of this option could have negative impacts on the local landscape, and this is reflected in the assessment findings.

Regarding the historic environment SEA topic, whilst these options will provide flood protection to listed buildings in the vicinity of this ODU, it is recognised that the construction of new defences may have adverse impacts on heritage assets, particularly the Mesolithic occupation site at Mother Siller's Channel on Stanpit Marsh. This is because remains at this site could be disturbed as a result of the construction of new defences. Due to this, only minor positive long-term significant effects are predicted overall. It is also noted that the new / upgraded defence near Bridge Street should seek to conserve the character of the conservation area and the setting of listed buildings within it, taking particular care at the interface with grade I listed 'Waterloo Bridge'.

Option 6

Under Option 6 (Adaptation / Resilience), property level protection would be implemented to properties at risk of flooding in this unit, and existing defences would be refurbished / maintained. However, the property level protection would not provide a high standard of protection (deep flooding could still cause flood damage to properties with property level protection). Furthermore, no new permanent raised defences would be constructed, and therefore public spaces and transport links would not be defended from flooding. This is reflected in the assessment findings, with minor negative significant effects predicted across a range of SEA topics. This includes the historic environment SEA topic, as listed buildings in the vicinity of this ODU may remain at risk of damage from flooding if property level protection measures are not appropriate.

By maintaining the existing verge around Stanpit, this would help to reduce the erosion risk to the historic landfill site, and could therefore be beneficial to the land, soil and water resources SEA topic. Due to this, minor positive significant effects are predicted under this SEA topic.

### 14.3.1 Cumulative effects

The options under ODU 9 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location is largely developed, and the undeveloped land is unlikely to be developed in the future as it covers a historic landfill site and flood plain.

Potential cumulative effects with the Lower River Avon Strategy that is currently being prepared by the Environment Agency have been considered. The two project teams have engaged in regular dialogue throughout the development of the projects. It is understood from the Lower River Avon project team that no major interventions to manage flood risk in the vicinity of ODU 9 are being proposed as part of the Lower River Avon project and therefore cumulative effects on environmental receptors in ODU 9 should be minimal. Any cumulative effects on environmental receptors upriver arising from options in ODU 9 are likely to be minimal given the downstream location and nature of the flood cell.

## 14.4 Leading Option selection

Two Leading Options were selected for ODU 9 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Sustain A.
- Backup Option: Adaptation / Resilience.

Delivery of the National Economic Option (Sustain A) is likely to lead to environmental benefits across most SEA topics, as indicated by the SEA. However, funding is uncertain, and if funding cannot be achieved, the Backup Option (Adaptation / Resilience) would be delivered. For the Sustain A option, there are significant potential positive benefits to biodiversity through saltmarsh restoration / enhancement, which would provide BNG and would help the saltmarsh habitat adjust to sea level rise and climate change.

Appropriate monitoring and mitigation will be required with the leading options to address any negative environmental effects. For example, for the historic environment it will be important for scheme design to consider solutions that are in keeping with the character and setting of the conservation areas and listed buildings, making use of appropriate design materials. It is also noted that the new / upgraded defence near Bridge Street should seek to conserve the character of the conservation area and the setting of listed buildings within it, taking particular care at the interface with grade I listed ‘Waterloo Bridge’.

# 15. SMZ 2 – ODU 10: Mudeford options assessment

## 15.1 Introduction

ODU 10 (shown in **Figure 15.1** below) spans the northern side of Christchurch Harbour between Stanpit Marsh and Chichester Way. Due to buildings being close to the water's edge, and a range of private ownerships along the frontage, developing a scheme that includes frontline defences would need to encompass extensive engagement with landowners/ stakeholders.

For a present day 1 in 200-year tidal flood event, an estimated 25 properties will be at risk within this unit, increasing to 370 properties in 100 years' time. Over the next 100 years, the total PV damages for this ODU are estimated to be just over £12.7million.

The SMP policy for this unit is 'Hold the Line' in the short-term, followed by 'Managed Realignment' in the medium-term and then reverting back to 'Hold the Line' in the long-term. The SMP intent for this policy is to manage flood risk initially through local protection and flood warning, recognising a potential need for a combination of setback defences to complement existing foreshore structures. The SMP Refresh (2020) recommended that the policy is revisited/ potentially amended pending outcomes of contaminated land assessments.

The eastern boundary of ODU 10 is different to the SMP[53] policy unit boundary. It is noted that the main area discussed in the SMP for potential realignment, as part of the SMP policy, is the area of open space immediately to the north of Mudeford Quay. This area of open space is actually included in ODU 11 rather than ODU 10.

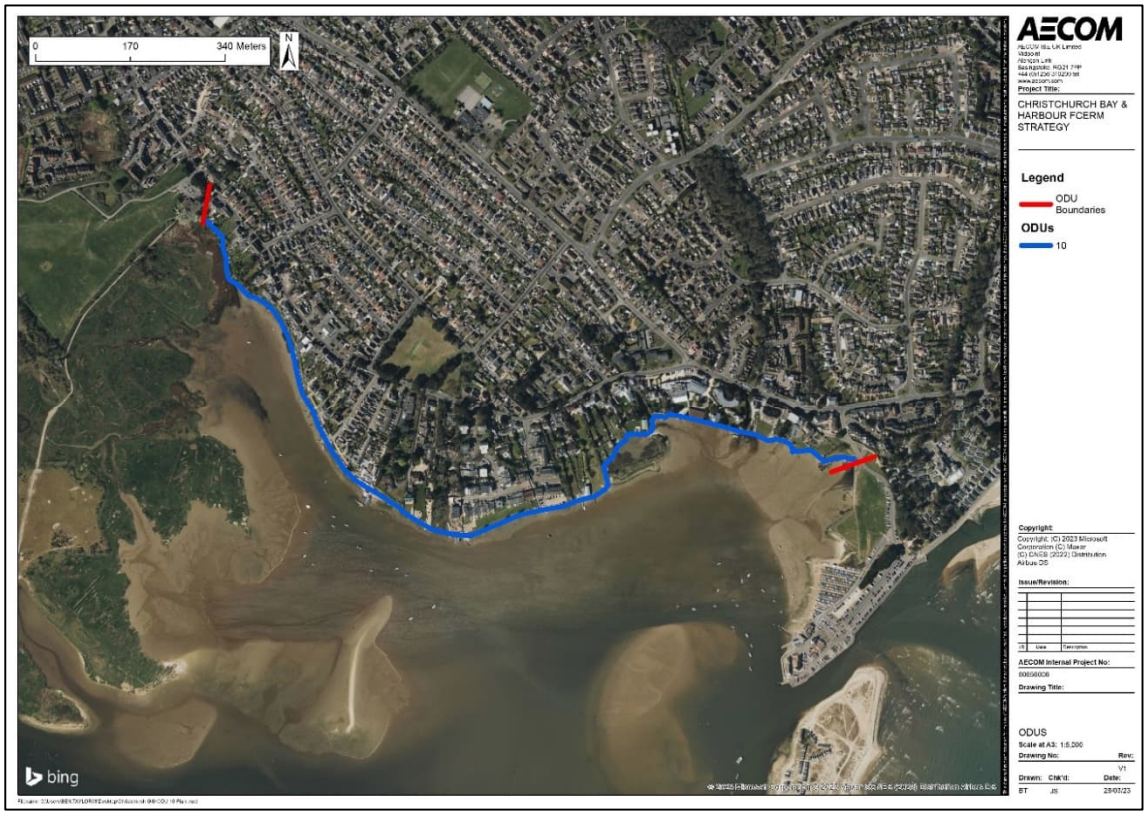


**Figure 15.1 ODU 10**

[53] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

# 15.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Improve A**: initially provide property level protection measures to the properties at risk and maintain the existing quay walls (epoch 1); then in epoch 2 or 3, construct a new frontline quay wall with a raised front wall along the length of the unit and along the banks of the River Mude and Bure Brook; investigate opportunities for saltmarsh restoration in front of defences (epochs 1-3).
5. **Improve B**: initially provide property level protection measures to the properties at risk and maintain the existing quay walls (epoch 1); then in epoch 2 or 3, construct a new frontline quay wall with a raised front wall along the east part of the unit and along the River Mude and Bure Brook; in epoch 2 or 3, construct a new setback wall along the west part of the unit whilst maintaining the existing quay wall in front; investigate opportunities for saltmarsh restoration in front of defences.
6. **Adaptation**: provide property level protection measures to the properties at risk and maintain the existing quay wall (epochs 1-3).

# 15.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 15.1** below and discussed in more detail underneath.

### Table 15.1 Assessment findings for ODU 10

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** |
| Biodiversity and geodiversity | ? | ? | 0 | ++ | ++ | 0 |
| Climate change | -- | -- | -- | ++ | ++ | - |
| Landscape | ? | ? | ? | - | - | ? |
| Historic environment | -- | -- | -- | ++ | ++ | - |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | -- | ++ | ++ | - |
| Transport and movement | -- | -- | -- | ++ | ++ | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The whole length of the ODU borders Christchurch Harbour SSSI[54]. This includes unit 11 (Stanpit Marsh) for a short distance near the western boundary of the ODU, and then unit 12 (Christchurch Harbour) for the remainder of the length of the ODU. The main habitat in both of these units is littoral sediment, and both are currently in a favourable condition. Notably, one of the reasons for notification of unit 12 of this SSSI is the variety of bird species that the site supports. The number of species both breeding and over-wintering are stable and increasing, which is reflected by the unit's favourable condition.

The part of the ODU that borders unit 11 of Christchurch Harbour SSSI also borders Stanpit Marsh, Christchurch LNR. The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

In terms of BAP priority habitats, the majority of the length of the ODU borders mudflats, whilst the part of the ODU nearest the western boundary borders coastal saltmarsh.

In terms of flood risk, the length of the ODU is primarily within Flood Zone 3. However, this does not extend far inland, especially along the western part of the ODU. The entire length of the ODU borders properties, and several roads are located near the harbour, including Stanpit Road, Fisherman's Bank, Waterside, Inveravon, Mude Gardens, and Chichester Way.

The ODU runs along the boundary of the New Forest[55] National Character Area (NCA) to the north, which includes the Lower Hampshire Avon Valley, and the Dorset Heaths[56] NCA to the south, which contains some of the best lowland heath left in England.

With regards to the historic environment, there is a cluster of listed buildings along Mudeford Road to the north of the eastern part of the ODU, including one grade II* listed building near the western boundary, only 40m inland. This part of the ODU is within Mudeford Quay Conservation Area. In addition, there are two grade II listed buildings on Stanpit Road to the north of the western boundary of the ODU. This part of the ODU follows the frontage of Stanpit and Fisherman's Bank Conservation Area. There have been a number of significant artefacts found within the vicinity of ODU 10 showing the high archaeological potential of the area.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing quay walls. Due to this, the existing quay walls are likely to fail over time. Combined with sea level rise, the risk of flooding would increase over time in this location. Notably, 25 properties are currently at risk from flooding from a 1 in 200-year event, and 370 properties are expected to be at risk in 100 years' time from the same return period. Therefore, major negative long-term significant effects are predicted across the majority of the SEA topics, including climate change, the historic environment, population and communities, and transport and movement. For the historic environment SEA topic, the negative effect is due to flood risk to several listed buildings in the unit.

Option 2 and Option 3

Under Option 2 (Do Minimum) and Option 3 (Maintain), repair / maintenance of the existing quay walls would be carried out as and when required. Given that there are no formal raised defences in this unit, this is not likely to improve the flood risk, and therefore the effects across the SEA topics for these options would be similar to Option 1 (Do Nothing). The effect on biodiversity and geodiversity under Option 3 (Maintain) is expected to be neutral given that it only involves maintaining existing quay walls in their current position. This is reflected in the assessment findings.

Option 4 and Option 5

Under Option 4 (Improve A) and Option 5 (Improve B), property-level protection measures would initially be provided to properties at risk, and the existing quay walls would be maintained (both during epoch 1). After this, a new frontline quay wall and defences would be constructed along the length of the unit (during epochs 2 and 3). Opportunities for saltmarsh restoration in front of the defences would also be investigated. This option performs well as it would reduce the risk of flooding to properties along the whole length of the ODU, as well as those either side of the channels of the River Mude and Bure Brook. Due to this, major positive long-term significant effects are predicted across the majority of the SEA topics for this option. The exceptions are the biodiversity and geodiversity and landscape SEA topics.

[54] Natural England (no date): 'Christchurch Harbour SSSI', [online] available to access via this link
[55] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link
[56] Natural England (2013): 'NCA Profile: Dorset Heaths (NE506)', [online] available to access via this link

Major positive significant effects are noted for Options 4 and 5 regarding the biodiversity and geodiversity and landscape SEA topics. Concerning biodiversity and geodiversity, there are significant potential positive benefits to biodiversity through saltmarsh restoration / enhancement, which would provide BNG. The new defences as part of these options would be constructed in close proximity to a number of environmental designations, such as Christchurch Harbour SSSI and Solent and Dorset Coast marine SPA, and BAP habitats such as mudflats and saltmarsh. Generally, there is sufficient space to construct defences either setback or within the footprint of the existing defences, and therefore opportunities to limit encroachment / habitat loss of designated areas could be explored during the design phase. This would limit the impacts on these designated sites.

Higher defences along the quay as part of this option could have negative effects on the local landscape, and this is reflected in the assessment findings.

With respect to the historic environment SEA topic, new raised flood defences and property level protection will reduce the risk to listed buildings and the conservation area and therefore a positive effect is noted. The design of any raised defences should seek to conserve the character of the conservation areas and the setting of the listed buildings within them. This design would be undertaken during scheme appraisal and development after the Strategy.

Option 6

Under Option 6 (Adaptation), property level protection would be implemented in the areas at risk from flooding. However, the property level protection would not provide a high standard of protection (deep flooding could still cause flood damage to properties with property level protection). Furthermore, no new permanent raised defences would be constructed, and therefore public spaces and transport links would not be defended from flooding in the southern and central parts of the unit. This is reflected in the assessment findings, with minor negative significant effects predicted across the majority of the SEA topics.

Minor significant negative effects are noted for the historic environment SEA topic due to flood risk to the Mudeford Quay Conservation Area. Property level protection measures could be used on listed buildings but these may need to be bespoke to the individual structures if traditional measures such as flood gates / waterproofing are not appropriate.

All Options

Neutral effects are predicted under the land, soil and water resources SEA topic across all six options because they are unlikely to impact these resources. This is because the land in this location is not used for agricultural purposes, nor are there any historic landfill sites, drinking water protected areas/ safeguard zones, or source protection zones in this location.

### 15.3.1 Cumulative effects

The options under ODU 10 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location is fully developed, with no room for future development.

## 15.4 Leading Option selection

Two Leading Options were selected for ODU 10 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve A.
- Backup Option: Adaptation / Resilience.

Delivery of the National Economic Option (Improve A) is likely to lead to environmental benefits across most SEA topics, as indicated by the SEA. However, funding is uncertain, and if funding cannot be achieved, the Backup Option (Adaptation / Resilience) would be delivered. For the Improve A option, there are significant potential positive benefits to biodiversity through saltmarsh restoration / enhancement, which would provide BNG.

Appropriate monitoring and mitigation will be required with the leading options to address any negative environmental effects. For example, for the historic environment it will be important for scheme design to consider solutions that are in keeping with the character and setting of the conservation areas and listed buildings, making use of appropriate design materials.

# 16. SMZ 2 – ODU 11: Mudeford Quay options assessment

## 16.1 Introduction

ODU 11 (shown in Figure **16.1** below) envelopes Mudeford Quay between Chichester Way on the harbour side and Mudeford Quay car park entrance on the open coast. There are few commercial and residential properties in this unit and over the next 100 years, the total PV damages for this ODU are estimated to be just over £1.3million.

The quay falls within SMP policy unit D2 and the policy is to 'Hold the Line' in the short-, medium- and long-term. The overall intent is to maintain the alignment of Mudeford Quay and the use of this area, which acts as a navigation training wall at the entrance to Christchurch Harbour. The SMP Refresh (2020) recommended that the policy here is revisited/ potentially amended to 'Hold the Line' with localised opportunities for 'Managed Realignment'.

The area of open space in the northern part of this unit falls within a different SMP[57] policy unit (unit F1). In this SMP policy unit, the policy recommends exploring 'Managed Realignment' opportunities in epoch 2. However, the SMP Refresh (2020) recommended that the policy is revisited/ potentially amended pending outcomes of contaminated land assessments.


**Figure 16.1 ODU 11**

[57] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

# 16.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (epoch 1).
4. **Sustain A**: upgraded floodwall around properties at western end of the Quay in epoch 1 or 2; raise over time to keep pace with SLR (epochs 2 and 3); maintain/ refurbish the existing frontline structures around the Quay as required (epochs 1-3).
5. **Sustain B**: as per Sustain A, except also construct new setback wall in northern part of unit (epochs 1 and 2), between green area and road.
6. **Improve A**: as per Sustain A, except the defence is constructed to its full length and height initially (e.g. no new construction after epoch 1 or 2).
7. **Improve B**: as per Sustain B, except the defence is constructed to its full length and height initially (e.g. no new construction after epoch 1 or 2).
8. **Adaptation/ Resilience**: Maintaining the existing quay walls as per the Maintain Option but also implement property level protection to properties at risk of flooding in the unit.

# 16.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 16.1** below and discussed in more detail underneath.

### Table 16.1 Assessment findings for ODU 11

| | Option number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Biodiversity and geodiversity | ? | ? | 0 | 0 | 0 | 0 | 0 | 0 |
| Climate change | -- | -- | - | + | ++ | + | ++ | - |
| Landscape | -- | -- | - | + | ++ | + | ++ | - |
| Historic environment | -- | -- | - | + | ++ | + | ++ | - |
| Land, soil and water resources | -- | -- | + | ++ | ++ | ++ | ++ | + |
| Population and communities | -- | -- | - | + | ++ | + | ++ | - |
| Transport and movement | -- | -- | - | - | 0 | - | 0 | - |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The western side of the ODU lies adjacent to unit 12 (Christchurch Harbour) of the Christchurch Harbour SSSI[58]. The main habitat in this unit is littoral sediment, and it is currently in a favourable condition. Notably, one of the reasons for notification of this SSSI is the variety of bird species that the site supports. The number of species both breeding and over-wintering are stable and increasing, which is reflected by the unit's favourable condition.

The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

It is also noted that the ODU is adjacent to the Mudeford Sandbank SNCI, which covers ODU 2.

In terms of BAP priority habitats, the western side of the ODU borders mudflats and a few small, isolated areas of coastal saltmarsh near the harbour side boundary of the ODU. The eastern side of the ODU does not border any habitats. However, the open coast boundary of the ODU is just south of an area of deciduous woodland.

In terms of flood risk, almost the entire quay is within Flood Zone 3. The southern end of the quay contains some properties, and Mudeford Quay Road provides access to the quay. Whilst not within the ODU, the area to the north of the quay contains visitor accommodation.

The ODU falls within the Dorset Heaths[59] National Character Area (NCA), which today contains some of the best lowland heath left in England.

With regards to the historic environment, grade II listed building 'Dutch Cottages Haven Cottages' is located at Mudeford Ferry Terminal, at the southern end of the quay. Whilst not within the ODU, there is another grade II listed building where the visitor accommodation is located, 140m north of the open coast boundary of the ODU. The ODU frontage is within Mudeford Quay Conservation Area.

With regards to land, soil and water resources, there is a historic landfill site[60] just below the harbour side boundary of the ODU, within the harbour. The contamination status of the materials for much of the historic landfill site is unknown and site investigations would be required to confirm this. The potential impacts associated with the historic landfill site on the land, soil and water resources SEA topic are therefore uncertain.

Option 1

Under Option 1 (Do Nothing), there will be no new defences or maintenance of existing defences and quay walls. Due to this, the existing defences are likely to fail over time. This could have a significant impact on the harbour entrance and the harbour itself, as it could lead to large-scale morphological changes to the area and increases in flood risk in some locations. Therefore, major negative long-term significant effects are predicted across the majority of the SEA topics.

Uncertainty is noted under the biodiversity and geodiversity SEA topic for this option, as large-scale changes to the morphology of the harbour could arise, which could impact habitats and species in the harbour. This could lead to positive or negative biodiversity changes. However, this will depend on how the harbour entrance evolves if Mudeford Quay were to erode (which is highly uncertain), and there is potential for both negative and positive effects.

With respect to the historic environment, this option may lead to damage to the Dutch Cottages Grade II listed building on the quay. Large-scale changes to the morphology of the harbour and a reduction in the sheltering provided by the quay in ODU 11 could also result in impacts to the historic environment within Christchurch Harbour itself if the flood risk were to increase across the wider area.

[58] Natural England (no date): 'Christchurch Harbour SSSI', [online] available to access via this link
[59] Natural England (2013): 'NCA Profile: Dorset Heaths (NE506)', [online] available to access via this link
[60] Catchment Based Approach Data Hub (2019): 'Historic Landfill Sites', [online] available to access via this link

Option 2

Under Option 2 (Do Minimum), only small-scale patch-repair maintenance of the existing defences will be carried out as and when required. This is likely to extend the service life of the existing defences, but only by several years, and therefore in the medium- and long-term, the same risks / effects as Option 1 (Do Nothing) are predicted.

Similar to Do Nothing, this option could lead to positive or negative changes to biodiversity in the future. Feedback from Natural England indicates that this option may lead to positive biodiversity changes, but more work would be needed to investigate this as any changes to morphology make this uncertain.

With respect to the historic environment, similar effects to the Do Nothing option could occur, but at a later date once it is no longer feasible to maintain the existing defences around the quay.

Option 3

Under Option 3 (Maintain), existing defences and quay walls will be routinely refurbished, beginning in epoch 1. The maintenance of the quay walls would ensure the FCERM standard of service of the quay would be sustained, which would reduce the risk of large-scale morphological changes from occurring. By also maintaining the raised defences in this location, the flood risk to the properties on the key would be less than Options 1 and 2 but would still increase over time due to sea level rise. Due to this increase in flood risk on the quay, minor negative significant effects are predicted under the climate change, landscape, historic environment, population and communities, and transport and movement SEA topics. This option could lead to minor positive significant effects under the land, soil and water resources SEA topic by reducing the risk of the historic landfill site eroding in the northern part of the unit (through maintenance of the quay wall). The effect of this option on biodiversity and geodiversity is expected to be neutral given that it only involves maintaining existing quay walls.

Option 4 and Option 6

Under Options 4 (Sustain A) and 6 (Improve A), the floodwall around the properties at the southern end of the quay would be upgraded, and the existing frontline structures around the quay would be maintained/ refurbished as required. This option would reduce the risk of flooding to the properties at the southern end of the quay but would not stop the rest of the quay from flooding, nor the access road / infrastructure to the north. Due to this, minor positive long-term significant effects are predicted under the majority of the SEA topics. This includes the historic environment SEA topic, as grade II listed building 'Dutch Cottages Haven Cottages' would likely be protected from damage as a result of flooding. The design of a wall in this location would need to consider the setting and character of the listed buildings and the conservation area and appropriate mitigation, such as selecting suitable materials for construction, should be undertaken.

Given that the quay would still be at risk from flooding on a frequent basis, minor negative significant effects are predicted under the transport and movement SEA topic. This is because the quay is used as a car park, and the standard of protection to the road to the north would also not be improved.

The effect on biodiversity and geodiversity under Options 4 and 6 is expected to be neutral. For the frontline structures adjacent to environmental designations, such as the Solent and Dorset coast marine SPA, the option involves maintaining / refurbishing these quay walls, which is not expected to impact biodiversity. The floodwall around the properties at the southern end of the quay would likely be setback and would also not be expected to lead to any impacts. There is potential for noise / vibration disturbance, but this could be mitigated by undertaking the defence refurbishments / construction outside of sensitive seasons for the species. During further appraisal / design, opportunities for BNG could be explored as part of the defence refurbishment / new defence construction.

Option 5 and Option 7

Under Options 5 (Sustain B) and 7 (Improve B), the same measures would be undertaken as those outlined under Option 4; however, a new setback wall in the northern part of the unit would also be constructed to defend the road. This option is considered to perform more favourably than Options 4 and 6 as it provides wider benefits, including to infrastructure and public open space. Due to this, major positive long-term significant effects are predicted under the majority of the SEA topics. This includes the historic environment SEA topic, as all listed buildings within / within proximity to the ODU will be protected from flooding. However, it is noted that the new setback wall should be designed with the Mudeford Quay Conservation Area in mind, as so not to adversely affect its character or the setting of the listed buildings within it.

Under the transport and movement SEA topic, neutral effects are predicted, as whilst this option would defend the road, the public car park on the quay would still be at significant risk of flooding. It would likely require frequent closure in the future, to prevent access during flooding conditions. Similar neutral effects are predicted under the biodiversity and geodiversity SEA topic as those predicted under Options 4 and 6.

Option 8

Under Option 8 (Adaptation / Resilience), property level protection would be implemented to the properties at risk from flooding and the quay walls would be maintained. By maintaining the quay walls, the quay would remain in place in the future and large-scale morphological changes to the area associated with the loss of the quay would be prevented. However, the property level protection would not provide a high standard of protection (deep flooding could still cause flood damage to properties with property level protection). Furthermore, no new permanent raised defences would be constructed, and therefore public spaces and transport links would not be defended from flooding. This is reflected in the assessment findings, with minor negative significant effects predicted across the majority of SEA topics.

Minor negative significant effects are noted for the historic environment SEA topic due to flood risk to the Mudeford Quay Conservation Area. Property level protection measures could be used on listed buildings but these may need to be bespoke to the individual structures if traditional measures such as flood gates / waterproofing are not appropriate.

### 16.3.1 Cumulative effects

The options under ODU 11 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location has no capacity for further development.

## 16.4 Leading Option selection

Two Leading Options were selected for ODU 11 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Do Minimum.
- Local Aspirational Option: Adaptation / Resilience.

Delivery of the Local Aspirational Option (Adaptation / Resilience) is likely to lead to negative environmental effects across most of SEA topics, as indicated by the SEA. However, the magnitude of impacts are likely to be much less than the Do Minimum option. In this unit, funding for new coastal management is likely to be very limited and there is a limited economic case to do more than Adaptation / Resilience. Notably, by maintaining the quay walls, the quay would remain in place in the future and large-scale morphological changes to the area associated with the loss of the quay would be prevented.

Monitoring and mitigation will be required with the leading options to address any negative environmental effects. For example, with respect to the historic environment SEA topic, the listed buildings that remain at risk of flooding could have appropriate mitigation put in place to address the risk on a property-by-property basis and make the properties more resilient.

# 17. SMZ 3 – ODU 12: Avon Beach and Friars Cliff options assessment

## 17.1 Introduction

ODU 12 (shown in **Figure 17.1** below) spans the open coast frontage between Mudeford Quay and Steamer Point. There are a variety of existing coastal defences in this ODU, including rock groynes, timber groynes, hybrid groynes, rock revetment and seawalls. The condition of these defences varies from good to poor. The area is a popular site for recreation and is used by people visiting the beach and beach huts.

The main risk in this ODU is from coastal erosion, although there is some localised flood risk. Over the next 100 years, the total PV damages for this ODU are estimated to be £8.9million. Over the next 20 years, nine properties are expected to be at risk from erosion under the 'Do Nothing' scenario, increasing to 140 properties over the next 100 years.

The SMP[61] policy for this area is 'Hold the Line' from the present day, with the intent to maintain the integrity of the beach through control structures and recharge. A strategic option for 'Managed Realignment' has not been included in the appraisal given the proximity of properties to the coastline in this location.

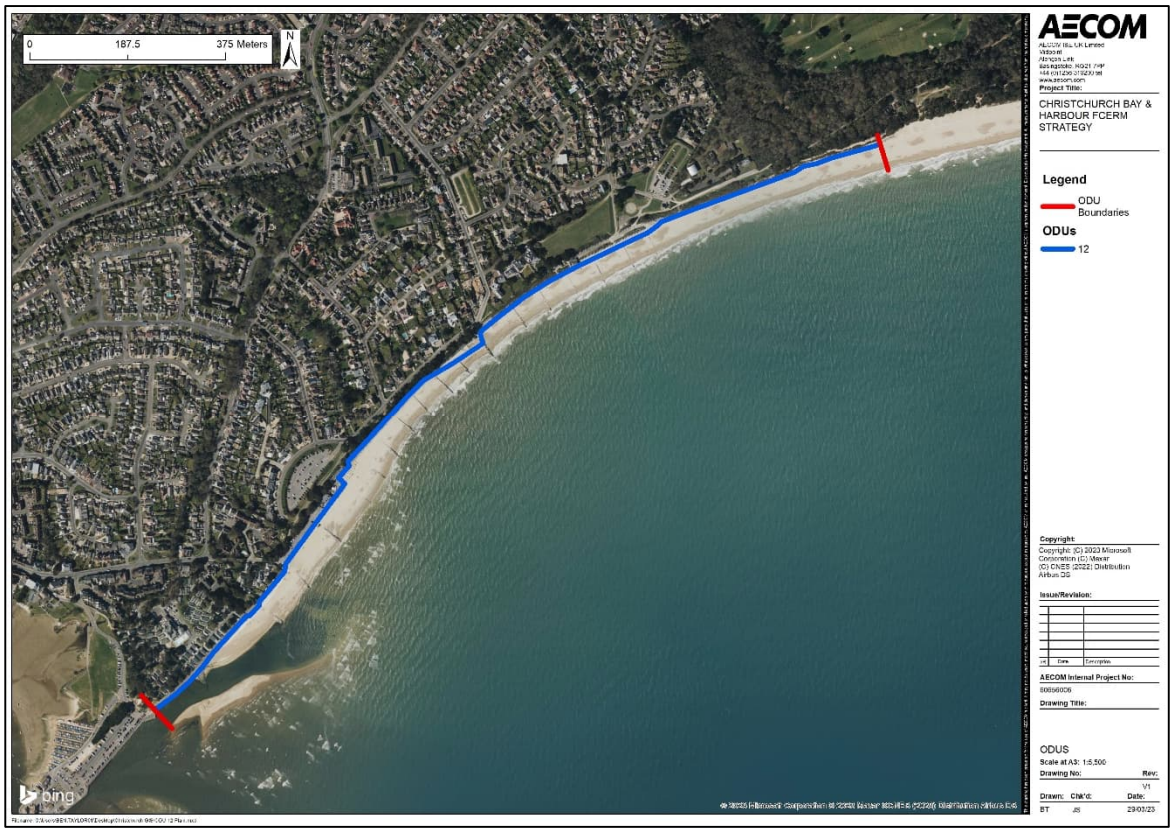


**Figure 17.1 ODU 12**

## 17.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.

[61] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Improve A**: refurbish existing defences once they reach the end of their design life (epoch 1) then undertake a beach nourishment scheme in epoch 2 alongside new groynes to help retain the beach material; locally raise seawall at Avon beach to ensure new beach volume can be retained; property level protection in epoch 3 to manage local risk at Mudeford Road.
5. **Improve B**: construct new larger linear defences along the length of the unit to provide the primary defence against flooding and erosion (note no beach nourishment with this option).
6. **Improve C**: this option is similar to Improve A but would also include public realm enhancements such as promenade raising to make the area more compatible with higher sea levels in the future.

Note that for the Improve A and C options, design of the groynes will be undertaken at the scheme stage and will aim to ensure sustainable beach levels whilst also allowing west-east sediment flows to work with natural coastal processes.

# 17.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 17.1** below and discussed in more detail underneath.

## Table 17.1 Assessment findings for ODU 12

| | Option number | | | | | |
|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** |
| Biodiversity and geodiversity | ++ | ++ | 0 | 0 | 0 | 0 |
| Climate change | -- | -- | - | ++ | ++ | ++ |
| Landscape | -- | -- | - | + | - | ++ |
| Historic environment | -- | -- | - | ++ | ++ | ++ |
| Land, soil and water resources | -- | -- | + | ++ | ++ | ++ |
| Population and communities | -- | -- | - | ++ | + | ++ |
| Transport and movement | -- | -- | - | ++ | ++ | ++ |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The eastern boundary of the ODU falls within unit 1 (Friars Cliff) of the Highcliffe to Milford Cliffs SSSI[62] for 380m. Unit 1 is currently in an unfavourable condition as the majority of the frontage is obscured by vegetation and/ or scree build up and is therefore inaccessible for study. The seawall in this location has disconnected the beach

[62] Natural England (no date): 'Highcliffe to Milford Cliffs SSSI', [online] available to access via this link

from the cliff face, interrupting natural coastal processes, restricting erosion and allowing vegetation encroachment. In addition, drainage pipes discharging along the cliff top are accelerating slumping in places.

The eastern boundary of the ODU is also adjacent to Steamer Point LNR to the north and the full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

In terms of BAP priority habitats, both boundaries of the ODU are south of an area of deciduous woodland. Other than this, this stretch of the beach does not fall within/ lie adjacent to any priority habitats.

In terms of flood risk, a large stretch of the beach in this ODU is within Flood Zone 2. However, the properties behind the beach are within Flood Zone 1. Properties border the beach for much of the length of the ODU, except near the eastern boundary where Steamer Point LNR is located. Avon Run Road runs parallel to the beach along part of the ODU, as do footpaths Mudeford Quay to Avon Beach and Steamer Point Path.

The western boundary of the ODU falls within the Dorset Heaths National Character Area (NCA), whilst the remainder of the ODU falls within the New Forest NCA.

With regards to the historic environment, the western boundary of the ODU is near a cluster of grade II listed buildings, largely located off Mudeford Road, the closest of which is 70m inland. Scheduled monument 'Round barrow east of Southcliffe Road, Mudeford' is located 240m inland, in the central part of the ODU. There are also two grade II listed buildings in roughly the same location as the scheduled monument, to the west off Bure Lane. Notably, there have been a number of significant artefacts found within the vicinity of the ODU, showing the high archaeological potential of the area. This includes the remains of a WWII pillbox close to the cliff.

In terms of land, soil and water resources, there are two small historic landfill sites along this ODU, just south of the western end of Avon Run Road. The contamination status of the materials for much of the historic landfill site is unknown and site investigations would be required to confirm this. The potential impacts associated with the historic landfill site on the land, soil and water resources SEA topics are therefore uncertain.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Due to this, the existing defences are likely to fail over time, increasing the risk of the erosion to the land and cliffs behind. Notably, over the next 20 years, nine properties would be expected to be at risk from erosion under this option, increasing to 140 properties over the next 100 years. Therefore, major negative long-term significant effects are predicted under the majority of the SEA topics. This includes the historic environment SEA topic, as nearby designated heritage assets will be at risk of flooding / erosion.

Major positive long-term significant effects are predicted under the biodiversity and geodiversity SEA topic. This is because, under this option, the rate of natural coastal processes and erosion would increase along unit 1 of the SSSI, potentially improving its condition (which is currently unfavourable).

Option 2

Under Option 2 (Do Minimum), only small-scale patch-repair maintenance of the existing defences would be carried out as and when required. This is expected to extend the residual life of the defences by up to several years. However, once the defences fail in the medium- and long-term, the erosion risk would be similar to Option 1 (Do Nothing), and therefore the environmental effects would be similar. This is reflected in the assessment findings.

Option 3

Under Option 3 (Maintain), existing defences would be routinely refurbished, beginning in epoch 1. Whilst this would help to reduce the risk of erosion, the long-term coastal evolution is more uncertain under this option, and erosion could impact key assets in this location. There could be negative effects associated with lower beach levels relative to sea levels in the future (particular with regards to landscape and population and communities).

Option 4

Under Option 4 (Improve A), the existing defences would be refurbished once they reach the end of their design life, then a beach nourishment scheme would be undertaken later on in the appraisal period alongside the construction of new groynes. The seawall at Avon Beach would also be raised to ensure the new beach volume could be retained. This combination of new defences and improvements to existing defences would protect the

most vulnerable areas within this ODU, whilst utilising less invasive measures such as beach nourishment. In addition, it would help to retain the recreation and amenity function of this area by sustaining beach levels with sea level rise. Due to this, major positive long-term significant effects are predicted under the majority of the SEA topics.

Major positive significant effects are noted under the historic environment SEA topic as this option would prevent the listed buildings adjacent to Mudeford road from eroding and would also seek to reduce the flood risk in this location in the future.

The condition of the SSSI is a key consideration regarding the potential effects on geodiversity under this option. With this option the toe of the cliff would continue to be defended, but cliff drainage would not be installed. This would help to stabilise the cliff, but a limited amount of natural erosion may occur as cliff slope processes and weathering may continue. However, the erosion would be expected to be limited. This could result in geological features being available, but less so relative to an unconstrained / undefended scenario. Whilst this is not expected to worsen the condition of the SSSI relative to the baseline (it is currently in an unfavourable condition), it is unlikely that this option would lead to an improvement of the SSSI condition, and therefore this option is predicted to lead to a neutral effect under this SEA topic.

Opportunities for BNG should be explored during further appraisal / design. New groynes in this location as part of this option present an opportunity to create intertidal habitat areas / pools to support ecology. There could also be opportunities to use biodiversity promoting materials and features as part of any refurbishments to the existing seawall defences.

Option 5

Under Option 5 (Improve B), a new larger defence seawall would be constructed along the length of the unit. Whilst this option would minimise the risk of erosion to properties in this location, the beach is likely to erode over time without improvements to the existing rock groynes and/ or beach nourishment, which could lead to the loss or reduced function of this valued amenity asset. In general, the option would likely lead to similar positive effects to Option 4 (Improve A). However, minor negative significant effects are predicted under the landscape SEA topic due to the impact of lowering beach levels. In addition, only minor positive significant effects are predicted under the population and communities SEA topic. This is because, whilst the option would defend properties from erosion, there could be a loss / reduction in the recreational function of the area. Similar neutral effects to Option 4 (Improve A) would also be expected under the biodiversity and geodiversity SEA topic, due to the defence of the cliff toe. There would also be opportunities to improve biodiversity and BNG as part of this option, which should be explored during further appraisal / design.

Option 6

Under Option 6 (Improve C), very similar impacts to Option 4 (Improve A) would be anticipated given the overall approach is the same, with the addition of wider public realm enhancements / promenade raising. To reflect the potential improvements to the public realm as part of this option, major positive significant effects are predicted under the landscape SEA topic.

### 17.3.1 Cumulative effects

The options under ODU 12 that include beach nourishment could lead to positive cumulative effects with the Hurst Spit to Lymington Strategy. The dominant direction of movement for littoral transport is from west to east within the bay and therefore placing material in ODU 12 could have a benefit as some of this material would be expected to travel east towards Hurst Spit and provide a sediment feed over time. This could positively impact the management of the spit due to the greater supply of sediment to the area. Larger beach volumes on the spit are considered positive as the beach provides the first line of defence against erosion and flooding to assets on the Spit, such as Hurst Castle and Lighthouse which are scheduled monuments / listed buildings.

## 17.4 Leading Option selection

Three Leading Options were selected for ODU 12 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve A.

- Local Aspirational Option: Improve C.
- Backup Option: ‘Scaled back’ Improve.

Delivery of either of the Leading Options in this unit is likely to lead to major positive significant effects across a range of SEA topics. Opportunities for BNG should be explored during further appraisal / design. New groynes in this location as part of these option present an opportunity to create intertidal habitat areas / pools to support ecology. There could also be opportunities to use biodiversity promoting materials and features as part of any refurbishments to the existing seawall defences. Upgrades to the defences should also take into account the character and setting of the area and ensure building materials are appropriate in relation to the historic environment.

# 18. SMZ 3 – ODU 13: Highcliffe options assessment

## 18.1 Introduction

ODU 13 (shown in **Figure 18.1** below) covers the frontage between Steamer Point and Chewton Bunny. The western part of the ODU does not currently have any hard coastal defences, with the beach providing the only protection to the cliff toe. To the east of Highcliffe Castle, a coastal defence scheme consisting of slope stabilisation (Highcliffe counterfort drains), a rock revetment, and rock groynes is present. The rock defences are currently in a good condition. Similarly to ODU 12, the area is a popular site for recreation and is used by people visiting the beach.

The main risk in this ODU is from coastal erosion with 18 properties expected to be at risk by 2074 and 173 properties at risk by 2124 under a Do Nothing scenario. Over the next 100 years, the total PV damages for this ODU are estimated to be over £6.9 million.

A key part of the option appraisal will be to consider how to effectively manage the transition from the currently defended coastline in ODU 13 to the undefended coastline in ODU 14 to the east.

The SMP[63] policy for this area is to 'Hold the Line' in the short-, medium- and long-term, with a note to consider the need for defences at Highcliffe Castle in the long-term.

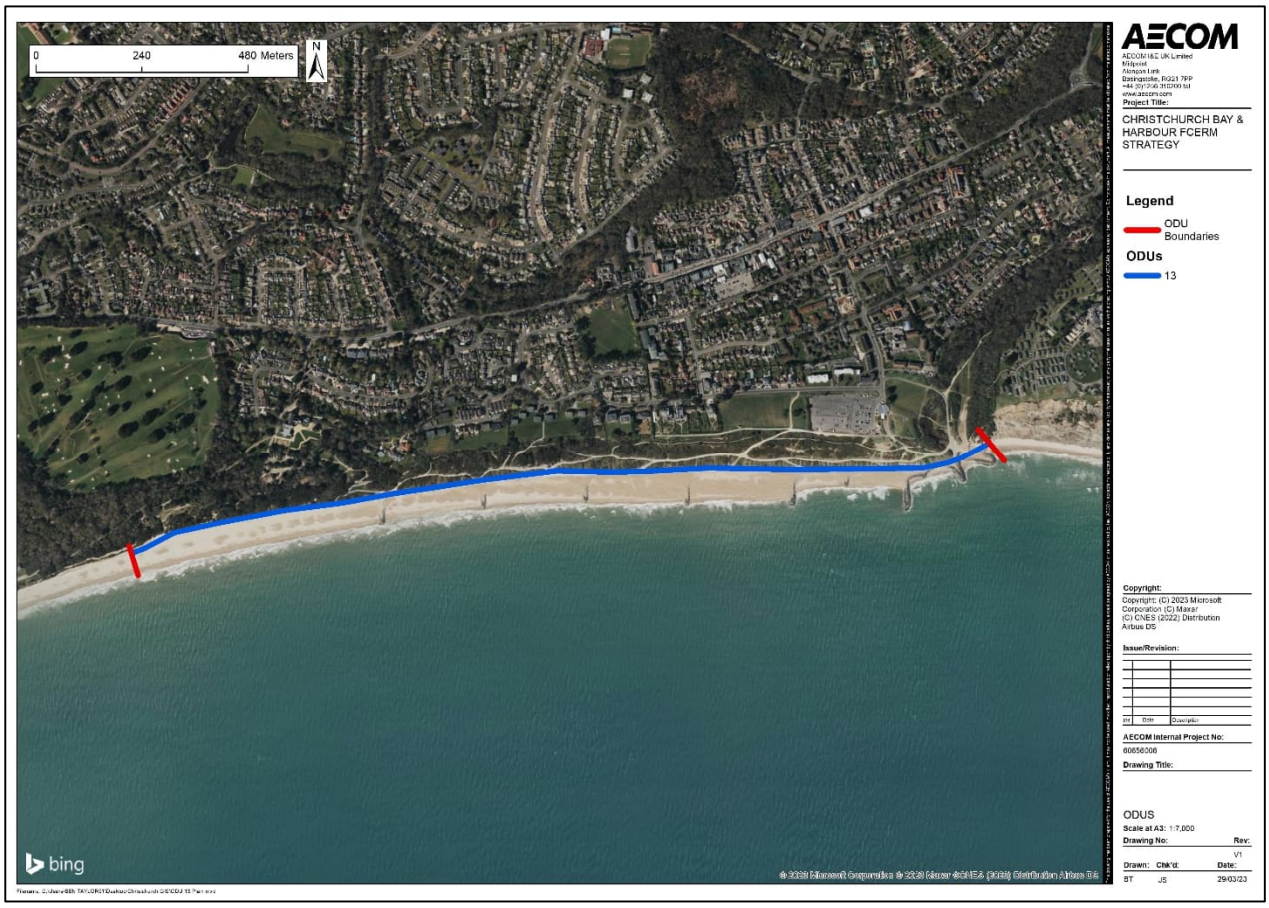


**Figure 18.1 ODU 13**

[63] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

## 18.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1); risk of outflanking current defences with this option.
4. **Improve A**: refurbishment of existing defences (from epoch 1) and undertake ongoing beach recycling (epoch 1); in epoch 2/ 3, undertake beach nourishment scheme as well as upgrading the rock groynes to help retain beach material (erosion will not be stopped entirely; some erosion will still occur); during epoch 1, construct outflanking defences (e.g. rock revetment) to the east of the existing defences to prevent outflanking at Naish cliff.
5. **Improve B**: refurbishment of existing defences (from epoch 1) and undertake ongoing beach recycling (epoch 1); in epoch 2/3, construct a new rock revetment along the full length of the frontage (erosion will not be stopped entirely; some erosion will still occur); during epoch 1, construct outflanking defences (e.g. rock revetment) to the east of the existing defences to prevent outflanking at Naish cliff.
6. **Improve C:** same approach as Improve A except the beach nourishment intervention would be undertaken later on in the appraisal period (erosion will not be stopped entirely; some erosion will still occur).
7. **Managed Realignment A**: reduce length of groynes in the east part of the unit to allow more beach material to bypass the groynes and reach Naish cliff to the east (epoch 1); otherwise implement Improve A.
8. **Managed Realignment B**: reduce length of groynes in the east part of the unit and construct nearshore breakwaters to encourage continuous beach between Highcliffe and Naish cliff and facilitate improved sediment transport to the east (epoch 1) (erosion will not be stopped entirely; some erosion will still occur).

Note that for the options that involve groyne upgrades / modifications, design of the groynes will be undertaken at the scheme stage and will aim to ensure sustainable beach levels whilst also allowing west-east sediment flows to work with natural coastal processes.

## 18.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 18.1** below and discussed in more detail underneath.

## Table 18.1 Assessment findings for ODU 13

| SEA topic | Option number 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Biodiversity and geodiversity | ++ | ++ | 0 | 0 | 0 | 0 | + | 0 |
| Climate change | -- | -- | - | ++ | ++ | ++ | ++ | ++ |
| Landscape | -- | -- | - | ++ | - | ++ | - | - |
| Historic environment | -- | -- | - | ++ | ++ | ++ | ++ | ++ |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | ++ | + | ++ | + | + |
| Transport and movement | -- | -- | - | ++ | ++ | ++ | ++ | ++ |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The whole length of the ODU intersects with Highcliffe to Milford Cliffs SSSI[64]. Whilst this includes unit 1 (Friars Cliff) for a very short distance at the western boundary, and unit 5 (Naish Cliff) for a very short distance at the eastern boundary, the majority of the length of the ODU comprises unit 2 (High Cliff). Notably, units 1 and 2 are currently in an unfavourable condition, whilst unit 5 is in a favourably condition. Concerning unit 2, this is because the majority of the frontage is affected by engineering works. Rock groynes prevent natural coastal processes and restrict erosion of the cliff face, whilst landscaped hard footpaths and drainage channels obscure the exposures of interest. Vegetation is also obscuring approximately 80% of the frontage.

Starting at the western boundary of the ODU, the ODU runs adjacent to Steamer Point LNR to the north for 340m and the full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

In terms of BAP priority habitats, the length of the ODU largely comprises maritime cliff and slope. Both boundaries of the ODU are also adjacent to areas of deciduous woodland, the largest being the one near the western boundary, covering the same area as Steamer Point LNR.

In terms of flood risk, the stretch of the beach within this ODU is partially within Flood Zone 3. However, the area behind the beach, where properties are located, is within Flood Zone 1. Whilst there are numerous properties along this stretch of the coast, they are set slightly further back inland compared to ODU 12. The same can be said for the roads in this area.

The ODU falls within the New Forest[65] National Character Area (NCA), which includes the Lower Hampshire Avon Valley.

With regards to the historic environment, there are several listed buildings to the north of this ODU, particularly along Lymington Road. However, these are relatively far away from the coastline. Set back from the road is a

[64] Natural England (no date): 'Highcliffe to Milford Cliffs SSSI', [online] available to access via this link
[65] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link

grade I listed building (Highcliffe Castle), 250m from the coastline. There is also a grade II* listed building (Greystones) set back from the road, near the eastern boundary of the ODU, 310m from the coastline.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Due to this, the existing defences are likely to fail over time, increasing the risk of the beach and cliffs eroding. Notably, 18 properties are expected to be at risk from erosion by 2074, increasing to 173 properties at risk by 2124 under this option. Due to this, major negative long-term significant effects are predicted under almost all of the SEA topics. This includes the historic environment SEA topic, as the grounds of Highcliffe Castle (Grade I listed) could be at risk from erosion.

Major positive long-term significant effects are predicted for biodiversity and geodiversity, as under this option, natural coastal processes will be allowed to take place along the full length of the frontage, including unit 2 of the SSSI, potentially improving its condition which is currently unfavourable.

Option 2

Under Option 2 (Do Minimum), only small-scale patch-repair maintenance of the existing defences would be carried out as and when required. This would be expected to extend the residual life of the defences by up to several years. However, once the defences fail in the medium- and long-term, the erosion risk would be similar to Option 1 (Do Nothing), and therefore the environmental effects would be similar. This is reflected in the assessment findings.

Option 3

Under Option 3 (Maintain), existing defences will be routinely refurbished, beginning in epoch 1. Whilst this would help to reduce the risk of erosion, the long-term coastal evolution is more uncertain under this option, and erosion could impact key assets in this location. There could be negative effects associated with lower beach levels relative to sea levels in the future (particularly regarding landscape and population and communities).

Option 4 and Option 6

Under Option 4 (Improve A) and Option 6 (Improve C), existing defences would be refurbished and ongoing beach recycling will be undertaken (both during epoch 1). Also during this time period, outflanking defences would be constructed to the east of the existing defences. Following this, a beach nourishment scheme would be implemented and the rock groynes would be upgraded to help retain beach material (both during epochs 2 and 3). This combination of new defences and improvements to existing defences would protect the most vulnerable areas within this ODU, whilst utilising less invasive measures such as beach recycling/ nourishment. Due to this, major positive long-term significant effects are predicted under the majority of the SEA topics for these options.

Major positive significant effects are recorded for the historic environment SEA topic as erosion of the grounds of Highcliffe Castle would be prevented under these options.

The condition of the SSSI is a key consideration regarding the potential impacts to geodiversity under this option. With this option the toe of the cliff would continue to be defended. This would help to stabilise the cliff, but a limited amount of natural erosion may occur as cliff slope processes and weathering may continue. However, the erosion would be expected to be limited. This could result in some geological features being available, but less so relative to an unconstrained / undefended scenario. Whilst this would not be expected to worsen the condition of unit 2 of the SSSI relative to the baseline (it is currently in an unfavourable condition), there may be reduced potential for the condition of the SSSI to improve. Therefore, this option is considered likely to lead to neutral effects under this SEA topic.

Opportunities for BNG should be explored during further appraisal / design. Refurbishing / upgrading the rock defences in this location as part of this option present an opportunity to create intertidal habitat areas / pools to support ecology and biodiversity.

Option 5

Under Option 5 (Improve B), the same measures will be taken as those set to take place during epoch 1 under Option 4. However, a new rock revetment would be constructed along the full length of the frontage during epoch 2/3 (instead of the beach nourishment scheme and rock groyne upgrades). In general, the option is considered likely to lead to major/ minor positive significant effects across the majority of SEA topics, as with Options 4

(Improve A) and 6 (Improve C). However, minor negative significant effects are predicted under the landscape SEA topic as a new larger hard structure would be required. There could also be potentially lower beach levels relative to sea level rise. In addition, only minor positive significant effects are predicted under the population and communities SEA topic as whilst the option would defend properties from erosion, there could be a loss / reduction in the recreational function of the area. A similar neutral effect to Option 4 (Improve A) is expected under the biodiversity and geodiversity SEA topic.

Option 7

Under Option 7 (Managed Realignment A), the length of the groynes would be reduced in the eastern part of the ODU, otherwise Option 5 will be implemented. Due to this, the beach / cliffs in the eastern part of the ODU is likely to erode faster and be realigned inland. The intent of this option would be to limit loss of property and assets, and therefore there are likely to be major/minor positive significant effects across several SEA topics. This includes minor positive significant effects under the biodiversity and geodiversity SEA topic, as the erosion of the cliff / reorientation of the shoreline in the eastern part of the unit could help improve the condition of the SSSI in this location. Minor negative significant effects are also predicted under the landscape SEA topic. This is associated with the reorientation of the coastline and erosion that would occur in the eastern part of the unit under this option. Major positive significant effects are recorded under the historic environment SEA topic as erosion of the grounds of Highcliffe Castle would be prevented under this option.

Option 8

Option 8 (Managed Realignment B) would be expected to have similar impacts to Option 7 (Managed Realignment A). However, it is expected that there would be a neutral effect on biodiversity / ecology as the cliff position would not be expected to erode significantly and the condition of the SSSI would likely remain the same.

All Options

Neutral effects are predicted under the land, soil and water resources SEA topic across all eight options because they are unlikely to impact these resources. This is because the land in this location is not used for agricultural purposes, nor are there any historic landfill sites, drinking water protected areas/ safeguard zones, or source protection zones in this location.

### 18.3.1 Cumulative effects

The options under ODU 13 that include beach nourishment could lead to positive cumulative effects with the Hurst Spit to Lymington Strategy. The dominant direction of movement for littoral transport is from west to east within the bay and therefore placing material in ODU 13 could have a benefit as some of this material would be expected to travel east towards Hurst Spit and provide a sediment feed over time. This could positively impact the management of the spit due to the greater supply of sediment to the area. Larger beach volumes on the spit are considered positive as the beach provides the first line of defence against erosion and flooding to assets on the Spit, such as Hurst Castle and Lighthouse which are scheduled monuments / listed buildings.

In addition, any decisions made within this ODU will have knock-on effects on ODU 14 (Naish Cliff and Barton on Sea), and therefore this should be considered when deciding which option to progress with.

## 18.4 Leading Option selection

Three Leading Options were selected for ODU 13 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve C.
- Local Aspirational Option: Improve A.
- Backup Option: ‘Scaled back’ Improve.

Delivery of either of the Leading Options in this unit is likely to lead to major positive effects across a range of SEA topics. Opportunities for BNG should be explored during further appraisal / design. Refurbishing / upgrading the rock defences in this location as part of this option present an opportunity to create intertidal habitat areas / pools to support ecology and biodiversity.

# 19. SMZ 4 – ODU 14: Naish Cliff and Barton on Sea options assessment

## 19.1 Introduction

SMZ 4 is an open coast environment between Naish Cliff and Barton on Sea, characterised by steep topography and an active cliff face. ODU 14 (shown in **Figure 19.1** overleaf) is the sole ODU in SMZ 4.

There are a variety of coastal defences in ODU 14. In the western part of the ODU, at Naish Cliff, the coastline is currently undefended and actively eroding. However, at Barton on Sea, there is a rock revetment at the toe of the cliffs, as well as rock groynes. In addition, various cliff drainage schemes have been undertaken in the past at Barton on Sea.

In the western part of the ODU, at Naish Cliffs, there is a beach in front of the cliff line and a privately owned caravan park at the top of the cliff. There is generally a lack of beach material in front of the Barton on Sea defences, and there are properties along the cliff top, beach huts and a cliff path located landward of the coastal defences. The area is an important recreation site.

The main risk in this area is from coastal erosion caused by cliff toe erosion and groundwater induced cliff slope instability. There is a risk of outflanking the defences at either end of this ODU. The interaction with the adjacent ODUs is therefore a crucial element in the option appraisal in this location. Over the next 100 years the total PV damages for this location are estimated to be £28.3million.

The SMP[66] policy in ODU 14 is 'Managed Realignment' in the short-, medium- and long-term. There are three SMP policy units within SMZ 4/ ODU 14 (B2, B3 and B4) and the SMP 'Managed Realignment' policy intent is slightly different for each area. In B2 (the eastern part of the ODU), the SMP policy intent is to maintain and improve the drainage system but acknowledge that the cliff top will continue to erode over time. In B3 (the central part of ODU), the intent is to initially maintain the areas with defences and drainage, allowing this to adapt to provide a transitional defence to Naish Cliff. In B4 (the western part of ODU), a potential way forward mentioned in the SMP was a limited intervention with recharge to allow adaptation of use. In the SMP refresh, it was noted that more clarification is needed for B4 regarding what cliff works are acceptable.

[66] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

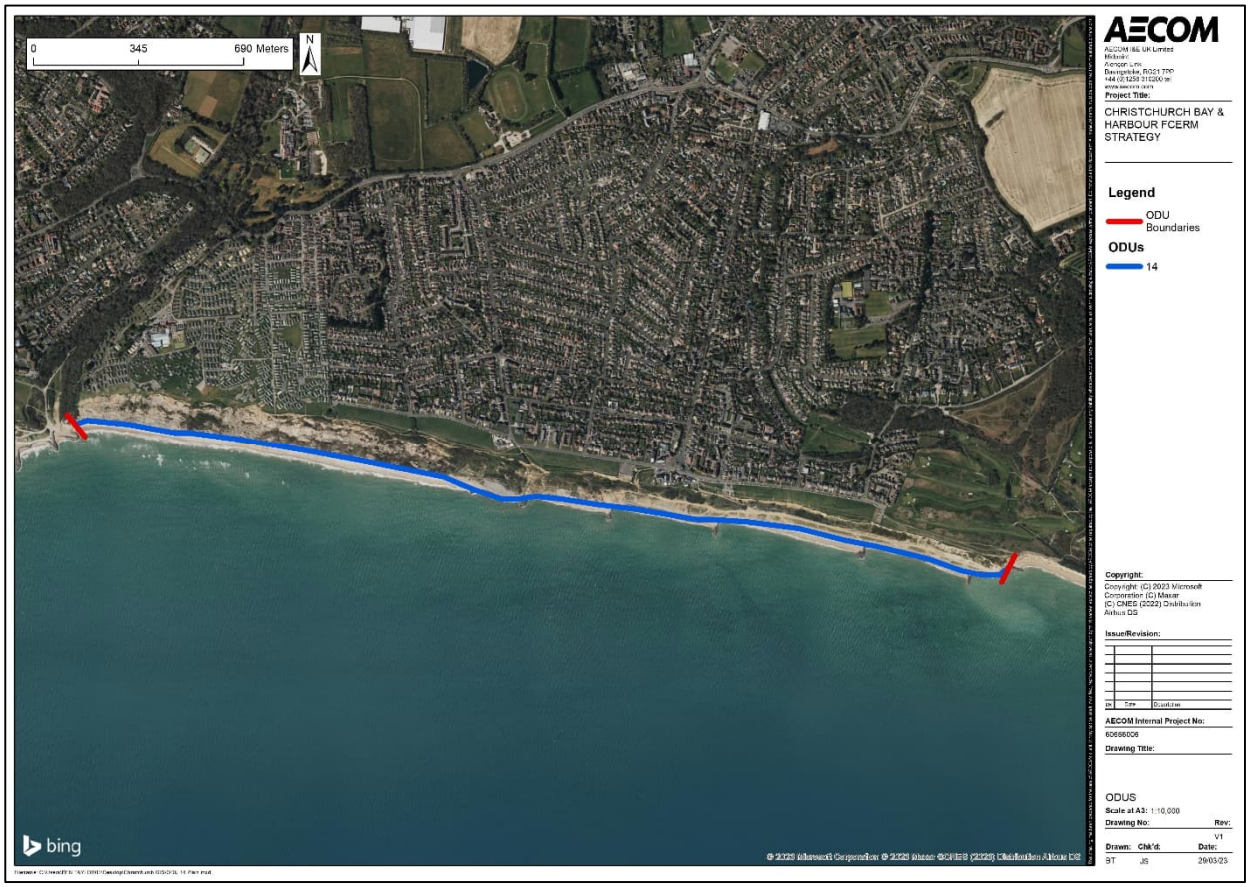


**Figure 19.1 ODU 14**

# 19.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1); significant amounts of cliff recession are expected to occur with this option due to groundwater/ land sliding and also due to toe defences being less effective with SLR.
4. **Improve A**: refurbishment of existing defences in first 10 years and repeated as required thereafter; large scale beach nourishment scheme along full length of unit in epoch 1 (erosion will not be stopped entirely; some erosion will still occur); construct cliff drainage along full length of unit in epoch 1.
5. **Improve B**: new rock defences along full length of the unit at the toe of the cliff as well as cliff drainage along the full length of the unit (epoch 1) (erosion will not be stopped entirely; some erosion will still occur).
6. **Managed Realignment A**: construct new / upgrade rock revetment and refurbish rock groynes between Marine Drive West to the Eastern end of the unit (epoch 1) (erosion will not be stopped entirely; some erosion will still occur); install new cliff drainage from Marine Drive West to the east in epoch 1 (note the eastern 1km of the unit does not need new drainage as it is functioning well); no new drainage at Naish cliff.
7. **Managed Realignment B**: as per Managed Realignment A, but the capital initial intervention would not be undertaken until epoch 2 (erosion will not be stopped entirely; some erosion will still occur) and a localised beach nourishment scheme at Naish Cliff would be undertaken.
8. **Managed Realignment C**: construct new / upgrade rock revetment and rock groynes to the currently defended part of the frontage (epoch 1) ; install new cliff drainage to the currently defended part of the

frontage in epoch 1 (note the eastern 1km of the unit does not need new drainage as it is functioning well); no new defences/ drainage at Marine Drive West.

9. **Managed Realignment D**: as per Managed Realignment C, but the capital initial intervention would not be undertaken until epoch 2 and a localised beach nourishment scheme at Naish Cliff would be undertaken.

10. **Managed Realignment E**: construct new / upgrade rock revetment and rock groynes in the east part of the unit (Marine Drive East) (epoch 1); install new cliff drainage to the currently defended part of the frontage in epoch 1 (note the eastern 1km of the unit does not need new drainage as it is functioning well); no new defences/ drainage at Marine Drive West.

11. **Managed Realignment F**: as per Managed Realignment E, but the capital initial intervention would not be undertaken until epoch 2 and a localised beach nourishment scheme at Naish Cliff would be undertaken.

Note that for the options that involve groyne upgrades / modifications, design of the groynes will be undertaken at the scheme stage and will aim to ensure sustainable beach levels whilst also allowing west-east sediment flows to work with natural coastal processes.

# 19.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 19.1** below and discussed in more detail underneath.

### Table 19.1 Assessment findings for ODU 14

| | Option number | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| Biodiversity and geodiversity | ++ | ++ | + | -- | -- | 0 | 0 | + | + | ++ | ++ |
| Climate change | -- | -- | - | ++ | ++ | ++ | ++ | + | + | - | - |
| Landscape | -- | -- | - | ++ | - | ++ | ++ | + | + | - | - |
| Historic environment | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | ++ | + | ++ | ++ | + | + | - | - |
| Transport and movement | -- | -- | - | ++ | ++ | ++ | ++ | + | + | - | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The whole length of the ODU is covered by the Highcliffe to Milford Cliffs SSSI[67], specifically units 5 (Naish Cliff) and 6 (Barton Cliff).

[67] Natural England (no date): 'Highcliffe to Milford Cliffs SSSI', [online] available to access via this link

Unit 5 (Naish Cliff) is currently in a favourable condition as it is one of only three undefended, naturally eroding sections of cliff within the SSSI, with good geological exposures and no vegetation encroachment.

Conversely, unit 6 (Barton Cliff) is currently in an unfavourable condition as the majority of the frontage is affected by engineering works. Rock groynes restrict the rate of littoral sediment transport in this location and where present the rock revetment at the cliff toe reduces the erosion of the cliff face, whilst permanent hard footpaths and drainage have been installed which obscure much of the exposures of interest. Vegetation is also obscuring the exposure along approximately 40% of the frontage.

The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

In terms of BAP priority habitats, the whole length of the ODU is covered by maritime cliff and slope. In addition, the area to the north of the western boundary of the ODU contains deciduous woodland.

In terms of flood risk, parts of the stretch of the beach in this ODU are within Flood Zone 2/ 3, especially in the western half. However, the properties to the north of the beach are within Flood Zone 1. As with ODU 13, the properties are set back slightly from the coastline and located on higher ground so are not at risk from tidal / coastal flooding.

The ODU falls within the New Forest[68] National Character Area (NCA), which includes the Lower Hampshire Avon Valley.

With regards to the historic environment, this ODU is relatively unconstrained with little in the way of designated assets. However, there are several listed buildings inland along the length of the ODU, the closest of which is a memorial located at the junction between Marine Drive East and Barton Court Avenue. The remaining listed building are largely concentrated to the north of the western boundary of the ODU. Notably, there have been a number of significant artefacts found within the vicinity of the ODU, showing the high archaeological potential of the area. This includes several structures relating to WWII and during scheme development a desk-based assessment should be undertaken to assess these structures in detail.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Due to this, the existing defences will fail over time, increasing the risk of the beach and cliffs eroding. Therefore, major negative long-term significant effects are predicted under the majority of the SEA topics. However, major positive long-term significant effects are predicted under biodiversity and geodiversity as under this option, natural coastal processes would increase along units 5 and 6 of the SSSI, which could help maintain the favourable condition of unit 5 and help improve the condition of unit 6. The area contains little in the way of designated heritage assets therefore the impact on the historic environment is neutral.

Option 2

Under Option 2 (Do Minimum), only small-scale patch repair maintenance of the existing defences would be carried out as and when required. This would be expected to extend the residual life of the defences by up to several years. However, once the defences fail in the medium- and long-term, the erosion risk would be similar to Option 1 (Do Nothing), and therefore the environmental effects would be similar. This is reflected in the assessment findings.

Option 3

Under Option 3 (Maintain), existing defences would be routinely refurbished, beginning in epoch 1. However, significant cliff recession would be expected to occur under this option due to groundwater/ land sliding, as well as toe defences being less effective with SLR. Due to this, minor negative significant effects are considered likely across a range of SEA topics.

Option 4

Under Option 4 (Improve A), existing defences would be refurbished. In addition, a large-scale beach nourishment and cliff drainage scheme would take place along the full length of the ODU (both during epoch 1). This option would aim to minimise the rate of erosion of the cliff (although some may still occur), but in doing so, it could have an adverse impact on the condition of the SSSI, particularly unit 5 (Naish Cliff), which is currently in a

[68] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link

favourable condition. Due to this, whilst positive long-term significant effects are predicted under the majority of the SEA topics, major negative long-term significant effects are predicted for biodiversity and geodiversity. Notably, the beach nourishment as part of this option would help to restore some of the supply of natural beach material that has been lost following the construction of coastal protection structures.

Option 5

Under Option 5 (Improve B), new rock defences at the toe of the cliff would be constructed and cliff drainage would be undertaken along the full length of the ODU (during epoch 1). This option faces the same issues as those outlined under Option 4 with regards to the SSSI at Naish Cliff, and therefore similar effects are predicted under the biodiversity and geodiversity SEA topic. As Option 5 does not deliver beach nourishment, there is a higher likelihood of lower beach levels relative to sea level rise under this option. Therefore, only minor positive significant effects are predicted under the population and communities SEA topic, as the recreation use of the beach could be impacted.

Option 6 and Option 7

Under Option 6 and 7 (Managed Realignment A and B), a rock revetment would be constructed between Marine Drive West (central part of the ODU) and the eastern end of the ODU, and the rock groynes could be refurbished as required. New cliff drainage would also be installed from Marine Drive West, but no drainage would be implemented at Naish Cliff. The aim of these options would be to control rates of erosion and reduce the loss of property and assets in the built-up areas of the unit. These options could therefore lead to major positive significant effects across the majority of SEA topics.

These options are predicted to have a neutral effect on the biodiversity and geodiversity SEA topic. The defences at the toe of the cliff would help to slow the erosion rate under this option, but erosion would still occur in units 5 and 6 of the SSSI (in a controlled manner). With respect to unit 6 of the SSSI, this option would not be expected to worsen the condition of the designation relative to the baseline (it is currently in an unfavourable position). However, there may be reduced potential for the SSSI condition to improve given the toe of the cliff would still be defended and there would be an element of control on the rate of erosion (relative to Option 1 (Do Nothing)). At unit 5 of the SSSI, erosion would still be expected to continue, and therefore it is unlikely that these options would change the favourable condition of the SSSI in this location.

The construction of new defences In this unit would be in close proximity to other environmental designations, such as the Solent and Dorset Coast marine SPA. These options are not expected to negatively affect this designation.

Option 8 and Option 9

Under Option 8 and Option 9 (Managed Realignment C and D), an upgraded rock revetment and rock groynes would be constructed at the currently defended part of the frontage. New cliff drainage would also be installed at the currently defended part of the frontage but not at Naish Cliff. These options do not provide toe defences along the whole length, and therefore there could be more properties at risk of erosion. Therefore only minor positive significant effects are predicted across the majority of the SEA topics (compared to major positive significant effects for Options 6 and 7).

Option 8 and Option 9 are however more likely to, on balance, have a minor positive significant effect under the biodiversity and geodiversity SEA topic. For geodiversity, there is potential for an improvement to the condition of the west part of unit 6 of the SSSI in the future, as this area of cliff would remain undefended.

The construction of new defences in this unit would be in close proximity to other environmental designations, such as the Solent and Dorset Coast marine SPA. These options are not expected to negatively affect this designation.

Option 10 and Option 11

Under Option 10 and 11 (Managed Realignment E and F), a new rock revetment and rock groynes would be constructed in the eastern part of the unit. New cliff drainage would also be installed at the currently defended part of the frontage. Relative to Options 6-9, this option would lead to a greater risk of erosion to properties along the frontage, and therefore minor negative significant effects are predicted across the majority of SEA topics.

The exception is the biodiversity and geodiversity SEA topic, where major positive significant effects are considered likely, given that most of the frontage would not have upgraded toe protection, and rates of cliff erosion could increase over time due to sea level rise. This could help contribute to an improvement of the condition of unit 6 of the SSSI.

Similar to Options 6-9, defence maintenance / construction works would be undertaken in close proximity to other environmental designations, such as the Solent and Dorset Coast marine SPA. These options are not expected to negatively affect this designation.

All Options

An uncertain effect is predicted under the historic environment SEA topic across all eleven options. This is because there are a few designated heritage assets within proximity of the coastline along the length of this ODU, including WWII structures, and there is potential to for erosion or defensive works to impact on known or unknown assets. There is likely to be little difference between options under this SEA topic. Nevertheless, Historic England will be consulted in the future as options progress.

Neutral effects are also predicted under the land, soil and water resources SEA topic across all eleven options because they are unlikely to impact these resources. This is because the land in this location is not used for agricultural purposes, nor are there any historic landfill sites, drinking water protected areas/ safeguard zones, or source protection zones in this location.

### 19.3.1 Cumulative effects

The options under ODU 14 that include beach nourishment could lead to positive cumulative effects with the Hurst Spit to Lymington Strategy. The dominant direction of movement for littoral transport is from west to east within the bay and therefore placing material in ODU 14 could have a benefit as some of this material would be expected to travel east towards Hurst Spit and provide a sediment feed over time. This could positively impact the management of the spit due to the greater supply of sediment to the area. Larger beach volumes on the spit are considered positive as the beach provides the first line of defence against erosion and flooding to assets on the Spit, such as Hurst Castle and Lighthouse which are scheduled monuments / listed buildings.

Any decisions made within this ODU will have knock-on effects on ODUs 13 (Highcliffe) and 15 (Barton on Sea to Hordle), and therefore this should be considered when deciding which option to progress with. Due to the prevailing littoral drift direction (from west to east) the potential for impacts in adjacent units will be greater in ODU 15.

## 19.4 Leading Option selection

Multiple Leading Options were selected for ODU 14 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Managed Realignment A.
- Backup Options: Managed Realignment B, Managed Realignment D, Maintain.

Delivery of the National Economic Option in this unit is likely to lead to major positive significant effects across most SEA topics. However, funding for this option is uncertain, and if funding cannot be found, then a choice of the Backup Options may be delivered instead. Managed Realignment B is expected to have similar positive effects, whilst Managed Realignment D and Maintain do not deliver the same level of positive environmental effects. Maintain has negative effects noted for most SEA topics.

# 20. SMZ 5 – ODU 15: Barton on Sea to Hordle Cliff options assessment

## 20.1 Introduction

SMZ 5 (shown in **Figure 20.1** below) spans over 2.5km along the open coast. ODU 15, which is the sole ODU in SMZ 5, is currently undefended with no linear coastal defences in place. The beach in front of the cliffs provides the only protection to the cliff toe. The exception is a single rock structure that is located in the western part of the ODU, constructed to protect a decommissioned storm outfall. The beach in this ODU is used for recreation purposes. Landward of the cliff line the land is primarily open space, including a golf course and agricultural land.

No properties are at risk from erosion in this ODU until epoch 3, when only a single property may be at risk, and therefore damages are significantly discounted.

Given the low level of risk in this area, the SMP[69] policy is 'No Active Intervention' for the short-, medium- and long-term, allowing natural rollback of the cliff.

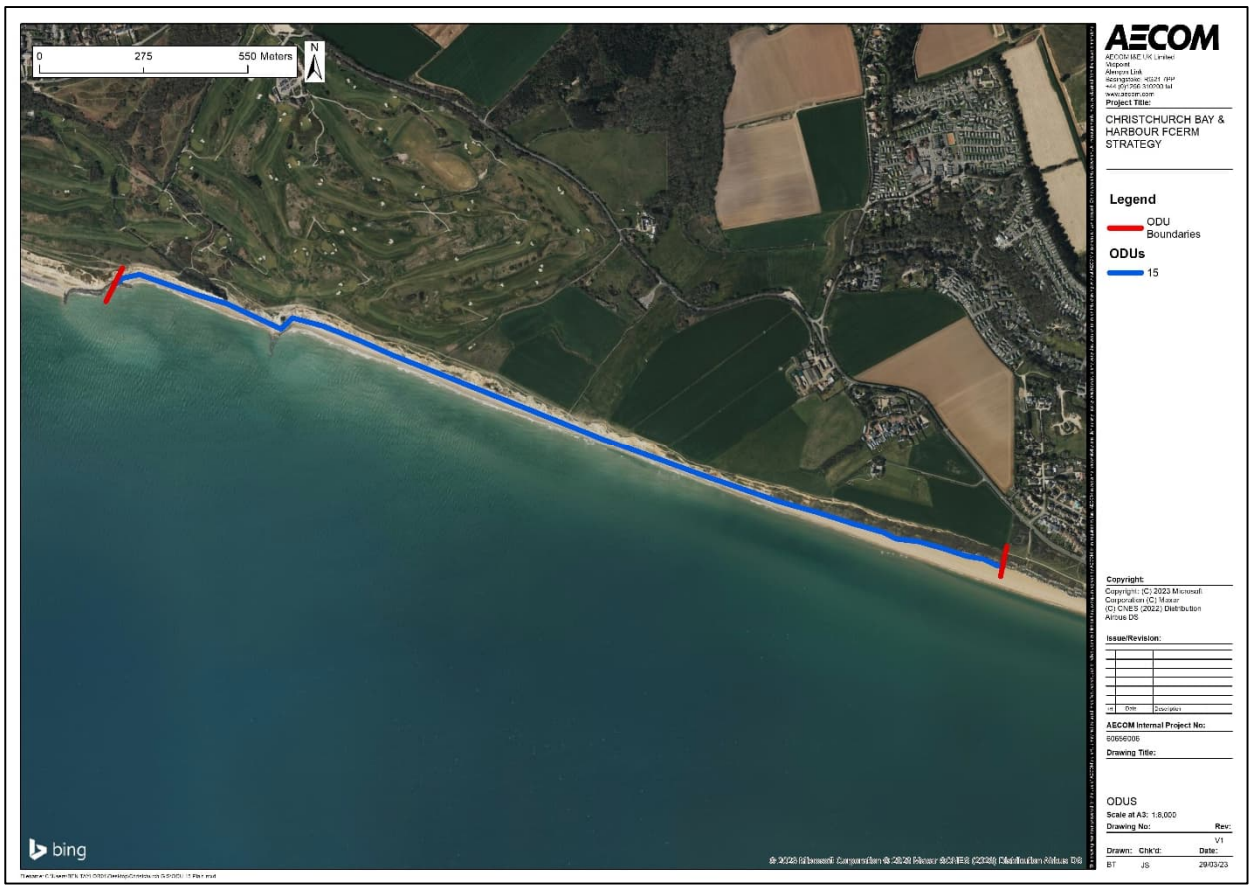


**Figure 20.1 ODU 15**

## 20.2 Strategic options

The strategic options for this ODU are as follows:

1. **Option 1 (Do Nothing)**: no new defences or maintenance; cliff erosion would continue/ increase in the future due to SLR.

[69] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

2. **Option 2 (Do Minimum**): small scale patch repair maintenance to existing defences around outfall (localised health and safety issues, would not provide FCERM benefit).
3. **Option 3 (Managed Realignment**): undertake beach management (beach recycling) (epochs 1-3) to help control rates of cliff erosion (would not be stopped but could be somewhat controlled by providing uniform beach profile/ topping up areas where erosion is happening more rapidly).

# 20.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 20.1** below and discussed in more detail underneath.

### Table 20.1 Assessment findings for ODU 15

| SEA topic | 1 | 2 | 3 |
|---|---|---|---|
| Biodiversity and geodiversity | ++ | ++ | + |
| Climate change | - | - | - |
| Landscape | - | - | - |
| Historic environment | ? | ? | ? |
| Land, soil and water resources | 0 | 0 | 0 |
| Population and communities | - | - | - |
| Transport and movement | - | - | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The whole length of the ODU falls within the Highcliffe to Milford Cliffs SSSI[70], specifically units 6 (Barton Cliff), 7 (Becton Bunny/ Hordle Cliff West), 8 (Hordle Cliff East) and 9 (Milford on Sea Cliff).

Unit 6 (Barton Cliff), which the ODU only falls within for a short distance (90m) at the western boundary, is designated for its exposures of fossil rich Barton Beds and Headon Beds. This unit is currently in an unfavourable condition as the majority of the frontage is affected by engineering works. Rock groynes and beach huts are preventing natural coastal processes and restricting erosion of the cliff face, whilst permanent hard footpaths and drainage have been installed which obscure much of the exposures of interest. Vegetation is also obscuring approximately 40% of the frontage.

Unit 7 (Becton Bunny/ Hordle Cliff West), which the ODU spans the length of, is designated for its exposures of fossil rich Barton Beds and Headon Beds. This unit is currently in a favourable condition as it is one of only three undefended, naturally eroding sections of cliff within the SSSI with good geological exposures and no vegetation encroachment.

Unit 8 (Hordle Cliff East), which the ODU spans the length of, is designated for its exposures of fossil rich Barton Beds and Headon Beds. This unit is currently in a favourable condition as it is one of only three undefended, naturally eroding sections of cliff within the SSSI with good geological exposures. There is some grassy vegetation present on the lower parts of slumped cliffs but most of the cliff frontage is fully exposed with no vegetation encroachment.

[70] Natural England (no date): 'Highcliffe to Milford Cliffs SSSI', [online] available to access via this link

Unit 9 (Milford on Sea Cliff), which the ODU only falls within for a short distance (60m) at the eastern boundary, is designated for its exposures of fossil rich Barton Beds and Headon Beds. This unit is currently in an unfavourable condition as there are beach huts (at the western end of the unit) and rock armour/ sea wall defences (at the eastern end of unit) present along the frontage, which are restricting natural coastal processes and reducing erosion of the cliff face. This has led to the cliff face becoming densely vegetated, obscuring the exposures of interest.

In addition to the above, the eastern boundary of the ODU is 220m southwest of Milford on Sea LNR and the full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

In terms of BAP priority habitats, almost the entire length of the ODU is covered by maritime cliff and slope. In addition, 240m north of the western boundary of the ODU is an area of lowland dry acid grassland, and there are several areas of deciduous woodland further inland along the length of the ODU.

In terms of flood risk, only the base of the cliffs along this stretch of the coastline are within Flood Zone 2/ 3. The land to the north of the cliffs is primarily within Flood Zone 1, with the exception of the path of the Becton Bunny stream, which enters the sea just east of the western boundary of the ODU.

There are very few properties within this ODU, which largely borders a golf course and agricultural land. However, there is a small cluster of properties along Whatley Road, which is 240m inland. To the south of this cluster of properties is Hordle Point House, which is only 180m inland. Moreover, Cliff Road is only 150m north of the coastal at the eastern boundary of the ODU, and to the north of this road is a larger residential area containing properties.

The ODU falls within the New Forest[71] National Character Area (NCA), which includes the Lower Hampshire Avon Valley.

With regards to the historic environment, the ODU is relatively unconstrained. The closest heritage asset to the coastline is a grade II listed building on the B3058 (Cliff Road), which is 430m north of the coastline. Notably, Hordle Cliff is a rich source of fossil remains, and there have been a number of significant artefacts found within the vicinity of this ODU, showing the high archaeological potential of the area.

All Options

Under Option 1, 2 and 3 (Do Nothing, Do Minimum and Managed Realignment), cliff erosion would continue over time, which could be beneficial to the condition of the SSSI. Due to this, major/ minor positive long-term significant effects are predicted under the biodiversity and geodiversity SEA topic for these options. However, the erosion of the cliff could lead to minor negative significant effects across the other SEA topics.

Uncertain effects are predicted under the historic environment SEA topic across all three options, due to the number of significant artefacts found within the vicinity of this ODU. Nevertheless, Historic England will be consulted in the future as options progress.

Neutral effects are also predicted under the land, soil and water resources SEA topic across all three options either, because they are unlikely to impact these resources. This is because the land in this location because there are not any historic landfill sites, no drinking water protected areas/ safeguard zones, or source protection zones in this location.

## 20.3.1 Cumulative effects

The options under ODU 15 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location primarily comprises a golf course. However, it is possible that the agricultural land may be developed in the future, although this is uncertain at this stage.

In addition, any decisions made within this ODU will have knock-on effects on ODU 14 (Naish Cliff and Barton on Sea), and therefore this should be considered when deciding which option to progress with.

[71] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link

# 20.4 Leading Option Selection

One Leading Option was selected for ODU 15 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Do Nothing.

Delivery of the National Economic Option (Do Nothing) is likely to lead to negative environmental effects across a range of SEA topics. However, there is no economic case in this unit to Do Something, and therefore no viable alternatives exist. A positive of the Do Nothing option is that it could lead to improvements to the SSSI condition, due to erosion of the cliff face in the future.

# 21. SMZ 6 – ODU 16: Cliff Road options assessment

## 21.1 Introduction

ODU 16 (shown in **Figure 21.1** below) spans over 700m between the Hordle beach huts and the west end of the defences at Rook Cliff. The majority of this ODU is currently undefended, and the beach in-front of the cliffs provides the main defence to the cliff toe. However, at the eastern end of the ODU there is a wall and groynes providing localised protection.

There are beach huts located at the top of the beach/ base of the cliff in this ODU. The cliffs and beach are used extensively for recreation and amenity. A number of beach huts have been lost along this frontage due to erosion of the beach causing instability of the cliff, including during storm events such as the 2014 winter storms.

The main risk here is from coastal erosion, although the risk to property is mainly expected to occur between 2074-2124. Over the next 100 years, the total PV damages for this ODU are estimated to be 7.4 million.

The SMP[72] policy for this area is 'Managed Realignment' in the short-, medium- and long-term. The intent of this policy is to maintain the road (Cliff Road) and properties, but with a possible future need for further refinement beyond the period of the SMP. The SMP refresh (2020) recommended that a detailed study was undertaken to re-examine and test the SMP policy in this location.

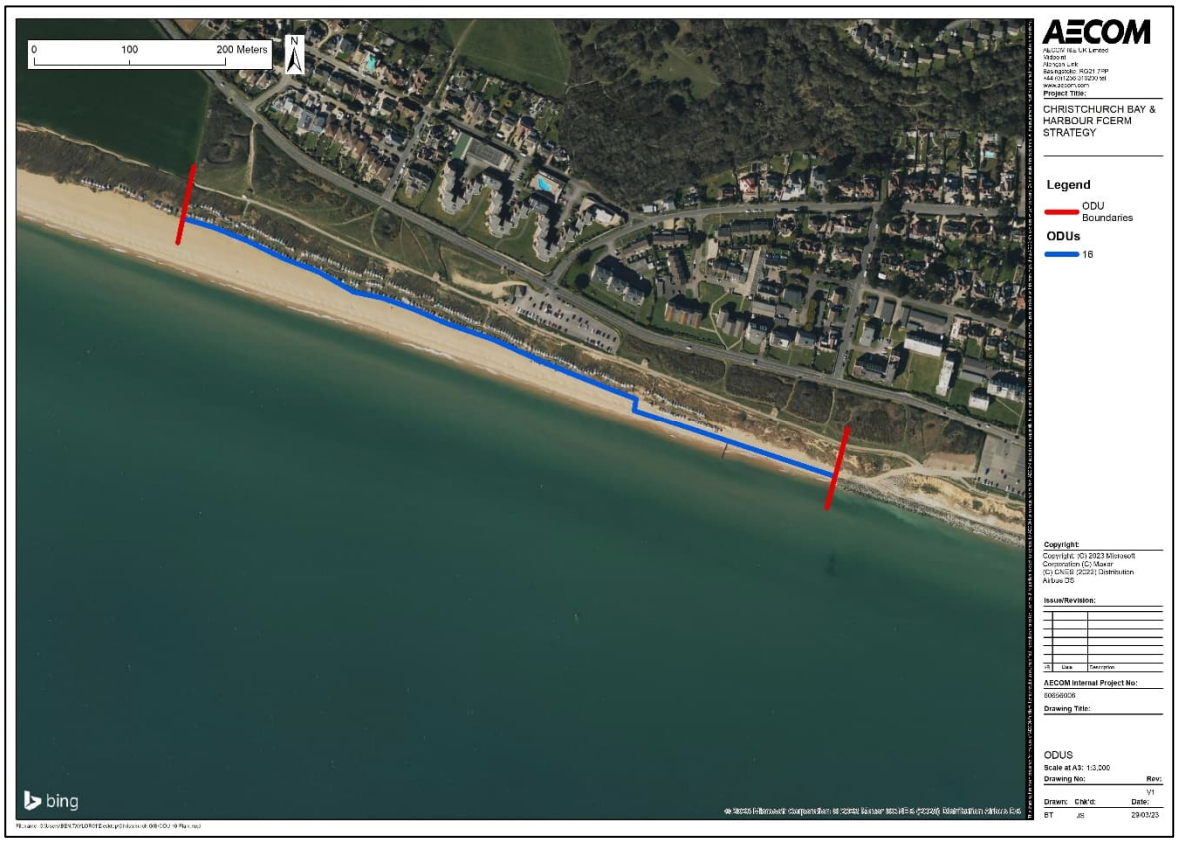


**Figure 21.1 ODU 16**

[72] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

# 21.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences. Ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Improve A**: new rock revetment along the full length of the unit to defend the cliff toe (epoch 1) (erosion will not be stopped entirely; some erosion will still occur).
5. **Managed Realignment A**: beach nourishment to the full frontage in epoch 1; construct new rock strong point (e.g. rock revetment) at junction of Whitby Road and Cliff Road at the same time (epoch 1).
6. **Managed Realignment B**: as per Managed Realignment A, but construction of strong point delayed until start of epoch 2 (cliff may erode in the interim).
7. **Managed Realignment C**: as per Managed Realignment A, but construction of strong point delayed further until mid-way through epoch 2 (cliff may erode in the interim).

# 21.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 21.1** below and discussed in more detail underneath.

### Table 21.1 Assessment findings for ODU 16

| | Option number | | | | | | |
|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Biodiversity and geodiversity | ++ | ++ | + | 0 | + | + | + |
| Climate change | -- | -- | - | ++ | + | + | + |
| Landscape | -- | -- | - | - | + | + | + |
| Historic environment | ? | ? | ? | ? | ? | ? | ? |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | + | + | + | + |
| Transport and movement | -- | -- | - | ++ | - | - | - |

### Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The whole length of the ODU is covered by unit 9 (Milford on Sea Cliff) of the Highcliffe to Milford Cliffs SSSI[73]. Unit 9 is currently in an unfavourable condition as the cliff face is densely vegetated, obscuring the exposures of interest. There are currently beach huts (at the western end of the unit) and rock armour/ sea wall defences (at the eastern end of unit) present along the frontage. In the eastern part of the unit the coastal defences restrict natural coastal processes and help to reduce erosion of the cliff face whereas in the undefended western end there is a wider natural beach that provides defence to the cliff toe. There is uncertainty as to whether or not the beach huts influence the erosion rate in this location. The beach is narrower and eroding at the eastern side and this has contributed to loss of huts in that area.

The Milford on Sea LNR is also located to the north of the ODU, 220m inland and the full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

In terms of BAP priority habitats, the entire length of the ODU is covered by maritime cliff and slope. Further inland, covering the same area as the Milford on Sea LNR, is an area deciduous woodland, good quality semi-improved grassland, and lowland dry acidic grassland.

In terms of flood risk, this ODU is at low risk of coastal flooding due to the higher topography of assets.

The ODU falls within the New Forest[74] National Character Area (NCA), which includes the Lower Hampshire Avon Valley.

With regards to the historic environment, there is only one designated heritage asset within proximity to this ODU, which is a grade II listed building near the eastern boundary, 210m north of the coastline. Notably, a number of structures relating to WWII have been recorded within the vicinity of this ODU.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Combined with sea level rise, the cliffs would be expected to erode in the future, leading to a loss of property and key infrastructure. Notably, the risk to property is mainly expected to occur between 2074-2124, when 190 properties will be at risk from coastal erosion. Therefore, major negative long-term significant effects are predicted under the majority of the SEA topics. However, major positive long-term significant effects are predicted under biodiversity and geodiversity for this option, as it would allow natural coastal processes and erosion of the cliff to take place along unit 9 of the SSSI, which could contribute to improvements in the condition of the unit.

Option 2

Under Option 2 (Do Minimum), given that most of the unit is undefended (in terms of hard defences), the assessment findings under this option are considered likely to be similar to Option 1 (Do Nothing).

Option 3

Under Option 3 (Maintain), existing defences in the eastern part of the unit would be routinely refurbished and beach recycling would be undertaken, beginning in epoch 1. This would likely lead to a slower rate of erosion than Option 1 (Do Nothing) and Option 2 (Do Minimum), but properties would still be at risk of erosion in the future. Minor negative significant effects are therefore predicted across the majority of the SEA topics, with the exception of biodiversity and geodiversity, where erosion of the cliff is likely to improve the condition of the SSSI.

Option 4

Under Option 4 (Improve A), a new rock revetment would be constructed along the full length of the ODU to defend the cliff toe. This would lead to reduced erosion risk to properties and key infrastructure in this unit, and therefore could lead to major positive significant effects across a range of SEA topics, including climate change, and transport and movement. However, only minor positive significant effects are predicted under the population and communities SEA topic, as construction of the revetment may require removal / replacement of the beach huts (subject to the design of the structure).

Neutral effects are predicted under the biodiversity and geodiversity SEA topic for Option 4. This is because this option would reduce the rate of natural coastal processes / and limit erosion along unit 9 of the SSSI. Whilst this

[73] Natural England (no date): 'Highcliffe to Milford Cliffs SSSI', [online] available to access via this link
[74] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link

would not be expected to worsen the condition of the SSSI relative to the baseline (it is currently in an unfavourable condition), there may be reduced potential for the condition of the SSSI to improve.

Minor negative significant effects are predicted under the landscape SEA topic, with a large rock revetment along the length of the frontage potentially impacting views / landscape of the area, which is used extensively for amenity and recreation.

Option 5, Option 6 and Option 7

With Options 5, 6 and 7 (Managed Realignment A-C), a beach nourishment scheme would be carried out along the full frontage and a new rock strong point (e.g. rock revetment) would be constructed at the junction of Whitby Road and Cliff Road (different timings subject to the option). These options are likely to slow and help control the rate of coastal erosion, especially in the most vulnerable locations, but would not stop it entirely. Beach nourishment could have a positive effect on Hurst Spit to the east of the ODU, through sediment supply and longshore drift. Due to this, minor positive long-term significant effects are predicted under the majority of the SEA topics.

This includes minor positive significant effects under the biodiversity and geodiversity SEA topic, as some erosion would occur, which may lead to an improvement in the condition of the SSSI. With the construction of a local strong point, there is potential to explore BNG opportunities. For example, if a rock structure is used, opportunities for habitat creation could be explored during appraisal / design work.

Minor negative significant effects ire considered likely under the transport and movement SEA topic as it is uncertain whether the car park at Hordle Cliff west would be fully defended in the future. With Options 6 and 7, a number of beach huts are likely to be lost to erosion in the interim period before a scheme is implemented, and there is also greater potential for impacts on cliff top amenities / access. However, on balance, these options are likely to score similarly to Option 5 under the population and communities SEA topic, given that the intent would be to defend permanent properties against erosion.

All Options

Uncertain effects are predicted under the historic environment SEA topic across all seven options, due to the notable number of structures relating to WWII have been recorded within the vicinity of this ODU. Nevertheless, Historic England will be consulted in the future as options progress.

Neutral effects are also predicted under the land, soil and water resources SEA topic across all seven options because they are unlikely to impact these resources. This is because the land in this location does not include any historic landfill sites, drinking water protected areas/ safeguard zones, or source protection zones in this location.

### 21.3.1 Cumulative effects

The options under ODU 16 that include beach nourishment could lead to positive cumulative effects with the Hurst Spit to Lymington Strategy. The dominant direction of movement for littoral transport is from west to east within the bay and therefore placing material in ODU 16 could have a benefit as some of this material would be expected to travel east towards Hurst Spit and provide a sediment feed over time. This could positively impact the management of the spit due to the greater supply of sediment to the area. Larger beach volumes on the spit are considered positive as the beach provides the first line of defence against erosion and flooding to assets on the Spit, such as Hurst Castle and Lighthouse which are scheduled monuments / listed buildings.

## 21.4 Leading Option selection

Multiple Leading Options were selected for ODU 16 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Managed Realignment C.
- Local Aspirational Option: Managed Realignment A/B.
- Backup Option: Maintain.

Delivery of either of the National Economic or Local Aspirational Options in this unit is likely to lead to positive effects across most SEA topics. However, funding for these options is uncertain, and if funding cannot be found, then the Backup option (Maintain) may be delivered instead. This option does not deliver the same level of positive environmental effects, with negative significant effects predicted across most SEA topics. With the Managed Realignment options, with the construction of a local strong point, there is potential to explore BNG opportunities. For example, if a rock structure is used, opportunities for habitat creation could be explored during further appraisal / design work.

# 22. SMZ 6 – ODU 17: Rook Cliff options assessment

## 22.1 Introduction

ODU 17 (shown in **Figure 22.1** below) is located between the start of the Rook Cliff defences and the Hurst Road West car park (just to the east of the White House). There are a variety of defences in this ODU, including concrete seawalls, a rock revetment, timber groynes and rock groyne. The condition of the defences is variable, with some defences in a poor condition with a low residual life. Recent work has been undertaken in this area to stabilise the defences following a failure at Westover.

The main risk in this location is from erosion with over 300 properties are expected to be at risk. Over the next 100 years, the total PV damages for this area are estimated to be over £11.5 million.

The SMP[75] policy for this area is to 'Hold the Line' in the short-, medium- and long-term. The SMP refresh (2020) recommended investigating options for future management (due to serious damage to defences during the 2019/20 storms), and potentially revisit the SMP policy subject to the outcome of the investigations.

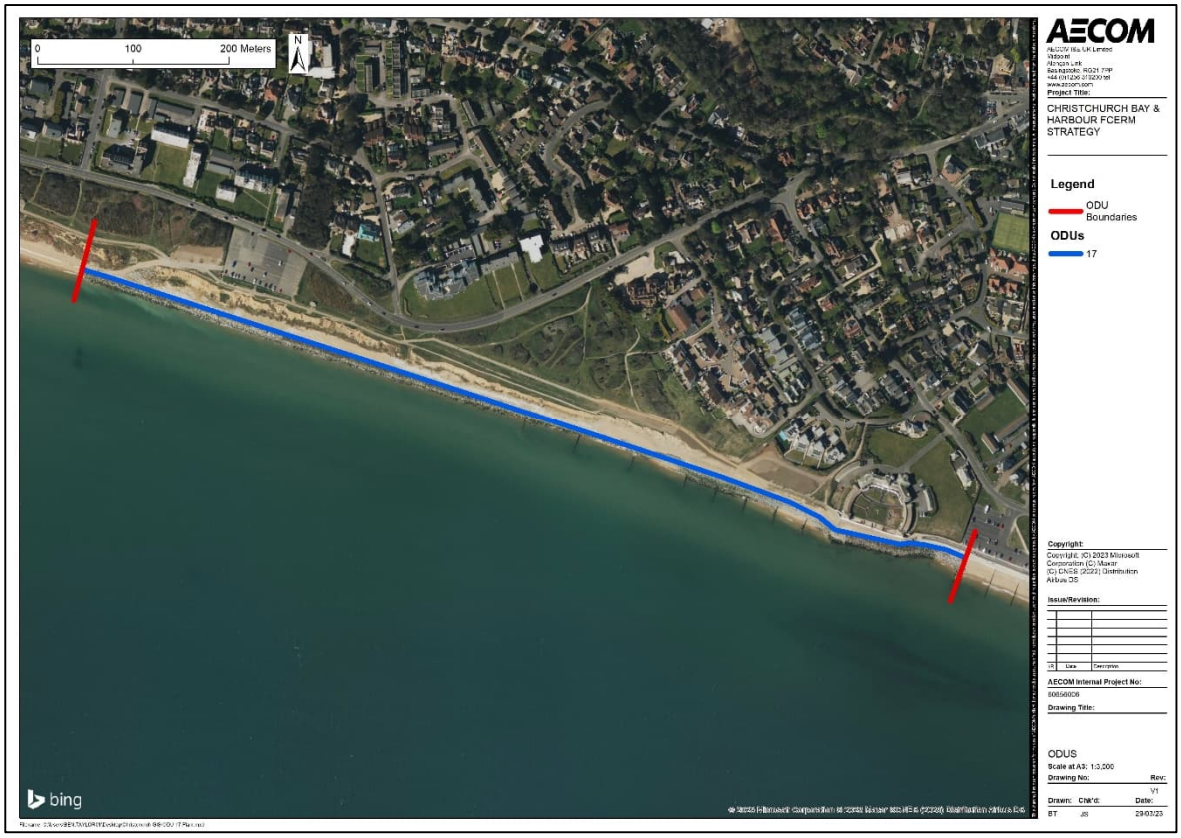


**Figure 22.1 ODU 17**

## 22.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences. Ensure health and safety compliance when defences fail.

[75] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Improve A**: in epoch 1 refurbish / upgrade existing rock revetment, upgraded groynes (epoch 1) (erosion will not be stopped entirely; some erosion will still occur).
5. **Improve B**: same approach as Improve A, except initial upgrades to defences delayed until the start of epoch 2.
6. **Improve C**: same approach as Improve A, except initial upgrades to defences delayed further until approximately mid-point of epoch 2.
7. **Managed Realignment A**: upgrade rock revetments at Rook Cliff and the White house, then removing the defences in between once failed and letting land realign / erode over time; manage rate of erosion (erosion will not be stopped entirely; some erosion will still occur). in undefended area with beach nourishment and construction of rock groynes in realigned area to help retain material (from epoch 1).
8. **Managed Realignment B**: construct nearshore breakwaters and undertaken beach nourishment to help retain beach material in this location and control rates of erosion.

Note that for the Improve options that involve groyne upgrades / modifications, design of the groynes will be undertaken at the scheme stage and will aim to ensure sustainable beach levels whilst also allowing west-east sediment flows to work with natural coastal processes.

# 22.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 22.1** below and discussed in more detail underneath.

### Table 22.1 Assessment findings for ODU 17

| | Option number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SEA topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Biodiversity and geodiversity | ++ | ++ | + | 0 | 0 | 0 | + | 0 |
| Climate change | -- | -- | ? | ++ | ++ | ++ | ++ | ++ |
| Landscape | -- | -- | ? | ++ | ++ | ++ | - | - |
| Historic environment | -- | -- | ? | + | + | + | + | + |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | ++ | ++ | ++ | - | ++ |
| Transport and movement | -- | -- | ? | ++ | ++ | ++ | ++ | ++ |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The western half of this ODU falls within unit 9 (Milford on Sea Cliff) of the Highcliffe to Milford Cliffs SSSI[76]. Unit 9 is currently in an unfavourable condition as the cliff face is densely vegetated, obscuring the exposures of interest. There are rock armour / seawall defences present along the frontage which defend the cliff toe and reduce erosion of the cliff face.

In addition to the above, Milford on Sea LNR is located to the north of the ODU, 370m north of the coastline and the full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA.

In terms of BAP priority habitats, the western half of the ODU contains maritime cliff and slope. Further inland, covering the same area as the Milford on Sea LNR, is an area of deciduous woodland.

In terms of flood risk, this ODU is primarily within Flood Zone 1. Cliff Road/ Park Lane runs close to the coastline in the western part of the ODU, and there are several properties near the coastline, particularly in the eastern part of the ODU.

The ODU falls within the New Forest[77] National Character Area (NCA), which includes the Lower Hampshire Avon Valley.

With regards to the historic environment, there are several grade II listed buildings within this stretch of coast, the closest of which (The White House) is near the eastern boundary of the ODU, 20m from the coastline. Notably, structures from WWII have been recorded in the vicinity of the ODU and during scheme development a desk-based assessment should be undertaken to assess these structures in detail.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Due to this, the existing defences will fail over time, increasing the risk of the coastline eroding. Notably, in epoch 3 (between 2074-2124), over 300 properties are expected to be at risk of coastal erosion. Therefore, major negative long-term significant effects are predicted across the majority of the SEA topics. This includes the historic environment SEA topic, as grade II listed building 'The White House' would be at risk of damage from erosion under this option.

Major positive long-term significant effects are considered likely under biodiversity and geodiversity for this option, as it would allow natural coastal processes / erosion to take place along unit 9 of the SSSI, which may help contribute to an improvement in its condition, which is currently unfavourable.

Option 2

Under Option 2 (Do Minimum), only small-scale patch-repair maintenance of the existing defences would be carried out as and when required. This would extend the service life of the existing defences, but only by several years at most. Therefore, the effects would be expected to be similar to Option 1 (Do Nothing), and this is reflected in the assessment findings.

Option 3

Under Option 3 (Maintain), the existing defences would be routinely refurbished, beginning in epoch 1. There is a trend of falling beach levels in this location, and this could continue in the future with rising sea levels. Therefore, whilst the intent of this option would be to sustain the service of the existing coastal defences, there is a risk that this may not be possible and defence failure / erosion could occur, leading to loss of properties and infrastructure. Uncertainty is noted under this option across most of the SEA topics, as it is unclear whether the existing defences will continue to prevent erosion in this location, particularly with SLR.

[76] Natural England (no date): 'Highcliffe to Milford Cliffs SSSI', [online] available to access via this link
[77] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link

Option 4, Option 5 and Option 6

Options 4, 5 and 6 (Improve A-C) would upgrade the defences and lead to reduced risk of erosion to properties and infrastructure in this unit. These options could therefore lead to major positive long-term significant effects across the majority of the SEA topics.

These options are likely to lead to neutral effects under the biodiversity and geodiversity SEA topic. The condition of the SSSI is a key consideration regarding the potential impacts to geodiversity under these options. With these options the cliff toe would continue to be defended, but there would be no drainage to the cliff face. This would help to stabilise the cliff, but a limited amount of natural erosion may occur as cliff slope processes and weathering may continue. However, the erosion would be expected to be limited. This could result in some geological features being available, but less so relative to an unconstrained / undefended scenario. Whilst this would not be expected to worsen the condition of the SSSI relative to the baseline (it is currently in an unfavourable condition in this location), there may be reduced potential for the condition of the SSSI to improve. Therefore, these options are considered likely to lead to neutral effects under this SEA topic. There would be opportunities to explore BNG as part of these options, for example, by creating intertidal habitats as part of the works to upgrade the rock defences. BNG opportunities should be explored as part of further appraisal / design work following the Strategy.

Minor positive long-term significant effects are predicted under the historic environment SEA topic as these options would provide protection to the grade II listed building 'The White House' through upgrades to the existing rock revetment along the length of the ODU. However, it is recognised that the rock revetment will need to be sensitively upgraded as not to adversely affect the setting of the listed building. This will be considered at the scheme level.

Option 7

Option 7 (Managed Realignment A) is likely to be favourable from a geodiversity perspective, as the managed realignment approach would allow part of the cliff to erode, which could have a positive impact on the condition of the SSSI. However, it is noted that the potential realignment area may be just to the east of the SSSI designation, so there is uncertainty on how significant of an effect this may have for local geodiversity.

Minor negative significant effects are predicted under the landscape SEA topic, given the potential landscape changes associated with realigning part of the coastline in this unit. Minor negative significant effects are also predicted under the population and communities SEA topic, as the area of open space at the cliff would be lost. Otherwise, this options is considered likely to lead to major positive significant effects across many of the remaining SEA topics, due to reducing the long-term erosion risk to properties and infrastructure.

Minor positive long-term significant effects are predicted under the historic environment SEA topic as this option would provide protection to the grade II listed building 'The White House' through an upgraded rock revetment at this location. However, it is recognised that the rock revetment will need to be sensitively designed as not to adversely affect the setting of the listed building. This will be considered at the scheme level.

Option 8

Similar scoring and rationale to the Improve options. However, potential for a minor negative impact in the landscape category as nearshore breakwaters are likely to change the landscape of this location.

All Options

Neutral effects are predicted under the land, soil and water resources SEA topic across all eight options because they are unlikely to impact these resources. This is because the land in this location is not used for agricultural purposes, nor are there any historic landfill sites, drinking water protected areas/ safeguard zones, or source protection zones in this location.

## 22.3.1 Cumulative effects

The options under ODU 17 are unlikely to lead to any cumulative effects with respect to other plans and strategies as the land in this location is largely developed, with little room for future development. Options in this unit do not include beach nourishment but would not be expected to restrict the natural movement of material to the east towards Hurst Spit relative to the existing situation.

# 22.4 Leading Option selection

Multiple Leading Options were selected for ODU 17 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve C.
- Local Aspirational Option: Improve A/B.
- Backup Option: Maintain.

Delivery of either of the National Economic or Local Aspirational Options in this unit is likely to lead to significant positive effects across most SEA topics. However, funding for these options is uncertain, and if funding cannot be found, then the Backup option (Maintain) may be delivered instead. The impacts with the Maintain option are more uncertain, as it is unclear how the existing defences will perform in the future. With the Improve options, there is potential to explore BNG opportunities during further appraisal / design.

Refurbishments and upgrades to the existing defences will need to consider mitigation to the environmental receptors which could be impacted. For example, in relation to the historic environment the upgrades should be undertaken in a way as not to adversely affect the setting of the White House listed building. This will be considered at the scheme level.

# 23. SMZ 6 – ODU 18: Milford on Sea Frontage options assessment

## 23.1 Introduction

ODU 18 (shown in **Figure 23.1** below) covers the area between Hurst Road West car park and the eastern end of Hurst Road, at the start of the rock revetment at the west end of Hurst Spit. There are a variety of defences in this ODU, including rock and timber groynes and a concrete seawall. The estimated residual life of most of the defences in this unit is <10 years.

The beach in this location has a long-term trend of erosion. Small-scale beach recharges have been undertaken on this beach since 2004, but with slightly increased frequency after 2008 after a seawall failure. However, the erosion of the beach is ongoing and beach volumes are declining. The beach in ODU 18 is used for recreation/ amenity. Beach huts are located in this unit as part of the structure that forms the seawall/ promenade at the western end of this frontage.

The main risk to the area is from coastal erosion. However, there is also a risk of flooding due to wave overtopping along the frontage (particularly at the eastern end of the ODU), as well as from tidal inundation from behind Hurst spit in the Keyhaven direction. Recent flooding occurred in the Valentine's storm of 2014, such as at Marine Café (now the Lighthouse). Over the next 100 years, the total PV damages from flooding and erosion are estimated to be over £11.4 million.

The SMP[78] policy for ODU 18 is to 'Hold the Line' in the short-term, followed by 'Managed Realignment' in the medium- and long-term. The SMP recommended considering options for developing a continuous beach between Rook Cliff and Hurst Spit.

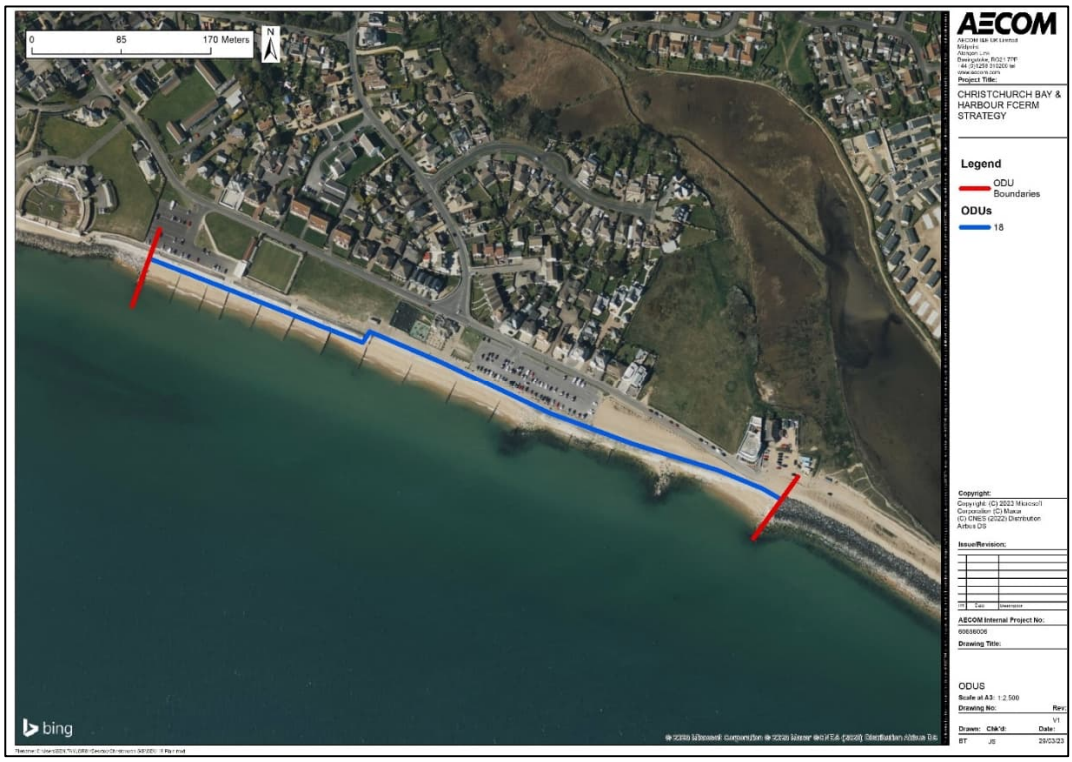


**Figure 23.1 ODU 18**

[78] Royal Haskoning (2011). 'Poole & Christchurch Bays Shoreline Management Plan Review (SMP2), [online] available to access via this link

# 23.2 Strategic options

The strategic options for this ODU are as follows:

1. **Do Nothing**: no new defences or maintenance of existing defences; ensure health and safety compliance when defences fail.
2. **Do Minimum**: small scale patch-repair maintenance to existing defences (as and when required).
3. **Maintain**: refurbishment of existing defences (from epoch 1).
4. **Improve A**: beach nourishment in first part of epoch 1, as well as refurbishment / upgrade of existing seawall and new groynes (also epoch 1) (erosion will not be stopped entirely; some erosion will still occur); new setback defences (e.g. floodwall or embankment) and property level protection in the east part of the unit in epoch 2 to manage flood risk.
5. **Improve B**: same approach as Improve A except the initial nourishment and defence improvements would be undertaken in epoch 2.
6. **Managed Realignment A**: rock revetment at east end of frontage (root of Hurst Spit) in first few years (epoch 1); allow existing seawall to fail and allow erosion into area of open space behind, creating more space for wider beach; construct new defence alignment in epoch 2 once desired shoreline position reached; use beach nourishment to control rate of erosion (epochs 1-3); new setback defences (e.g. floodwall or embankment) and property level protection in the east part of the unit in epoch 2 to manage flood risk.
7. **Managed Realignment B**: construct nearshore breakwaters and undertaken beach nourishment to help retain beach material in this location and control rates of erosion.

Note that for the options that involve groyne upgrades / modifications, design of the groynes will be undertaken at the scheme stage and will aim to ensure sustainable beach levels whilst also allowing west-east sediment flows to work with natural coastal processes.

# 23.3 Assessment findings

The assessment findings for each option, organised by SEA topic, are set out in **Table 23.1** below and discussed in more detail underneath.

### Table 5.18 Assessment findings for ODU 18

| | Option number | | | | | | |
|---|---|---|---|---|---|---|---|
| **SEA topic** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| Biodiversity and geodiversity | -- | -- | ? | + | + | + | + |
| Climate change | -- | -- | ? | ++ | ++ | ++ | ++ |
| Landscape | -- | -- | ? | + | + | - | - |
| Historic environment | ? | ? | ? | ? | ? | ? | ? |
| Land, soil and water resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Population and communities | -- | -- | - | ++ | ++ | - | ++ |
| Transport and movement | -- | -- | - | ++ | ++ | - | ++ |

## Key (likely significant effects)

| Major positive | Minor positive | Neutral | Uncertain | Minor negative | Major negative |
|---|---|---|---|---|---|
| ++ | + | 0 | ? | - | -- |

The full length of the frontage is adjacent to or in proximity of the Solent and Dorset coast marine SPA. In addition, the area to the north of the ODU is covered by the Solent and Southampton Water SPA/ Ramsar site, the Solent Maritime SAC[79], the Hurst Castle and Lymington River Estuary SSSI[80], and the Sturt Pond LNR. The LNR is only 40m from this stretch of the coastline, whilst the remaining sites are 70m northeast from the eastern boundary of the ODU at the closest point.

In terms of BAP priority habitats, the beach (open coast) along this ODU is not covered by a priority habitat but the area to the north of Hurst Spit consists of a mix of coastal saltmarsh, saline lagoons and reedbeds.

In terms of flood risk, whilst the land to the north of the coastline along this ODU is within Flood Zone 1, the land to the northeast of the eastern boundary of the ODU is within Flood Zone 3, as this is where Danes Stream enters the sea. There are properties within this ODU, north of Hurst Road, which runs parallel to the coastline. There are two car parks adjacent to the beach.

The ODU falls within the New Forest[81] National Character Area (NCA), which includes the Lower Hampshire Avon Valley.

With regards to the historic environment, this ODU is relatively unconstrained. The nearest cluster of listed buildings directly to the north of this ODU is along Keyhaven Road, 540m from the coastline. However, there are three listed buildings in neighbouring ODU 17 (Rook Cliff), the closest of which (The White House) is 60m west of the western boundary of this ODU. Notably, structures relating to WWII have been recorded in the vicinity of the ODU and during scheme development a desk-based assessment should be undertaken to assess these structures in detail.

It is recognised that the ODU is immediately adjacent to Hurst Spit, which contains two grade II listed buildings and scheduled monument 'Hurst Castle and lighthouse'. The scheduled monument is considered one of the best-preserved defence forts in the country. It is in an extremely vulnerable position, situated on a remote and exposed shingle spit which commands the Needles Passage between the Isle of Wight and the mainland. With rising sea levels and more frequent storms and the historic construction of sea defences around Christchurch Bay, the integrity of the spit is now under increasing pressure. The impact of options in ODU 18 (as well as other units within the bay) has been considered in the cumulate effects section of the ODU.

Option 1

Under Option 1 (Do Nothing), there would be no new defences or maintenance of existing defences. Due to this, the existing defences will fail over time, increasing the risk of the coastline eroding. In addition, due to sea level rise, the flood risk would be expected to increase over time. Notably, 58 properties are expected to be at risk from coastal erosion by 2074, and a further 79 properties will be at risk by 2124. Therefore, major negative long-term significant effects are predicted across the majority of the SEA topics for this option.

With respect to the biodiversity and geodiversity SEA topic, major negative significant effects are expected under this option, as failure of defences could lead to damage to a range of environmental designations, including the European designated sites at Sturt Pond / behind Hurst Spit.

Option 2

Under Option 2 (Do Minimum), only small-scale patch-repair maintenance of the existing defences would be carried out as and when required. This would extend the service life of the existing defences, but only by several years at most, and this is not sufficient to prevent the decline in the condition of defences. Therefore, effects are expected to be similar to Option 1 (Do Nothing), and this is reflected in the assessment findings.

[79] JNCC (no date): 'Solent Maritime', [online] available to access via this link
[80] Natural England (no date): 'Hurst Castle and Lymington River Estuary SSSI', [online] available to access via this link
[81] Natural England (2013): 'NCA Profile: New Forest (NE477)', [online] available to access via this link

Option 3

Under Option 3 (Maintain), the existing defences would be routinely refurbished, beginning in epoch 1, alongside small-scale beach management (i.e. small regular replenishment). There is a trend of falling beach levels in this location, and this could continue in future with rising sea level. Therefore, whilst the intent of this option would be sustaining the service of the existing coastal defences, there is a risk that this may not be possible, and defence failure / erosion could occur, leading to loss of properties and infrastructure. Uncertainty is noted under this option across the biodiversity and geodiversity, climate change, and landscape SEA topics, as it is unclear whether the existing defences will continue to prevent erosion in this location, particularly with sea level rise.

Minor negative significant effects are considered likely under the population and communities and transport and movement SEA topics as properties and infrastructure remain at risk of erosion / flooding under this option, although not to the same severity as under Options 1 and 2.

Option 4 and Option 5

Under Option 4 and 5 (Improve A and B), the existing defences would be upgraded, new flood defences constructed, and beach nourishment would be undertaken. This would help to reduce the risk of flooding and erosion to properties and assets in the unit. Therefore, major positive significant effects are predicted across the majority of the SEA topics.

Minor positive significant effects are considered likely under the landscape SEA topic, as despite higher defences (relative to now), beach nourishment would lead to a larger beach in the area and improve the overall visual appeal of the location.

Minor positive significant effects are also expected under the biodiversity and geodiversity SEA topic, as Options 4 and 5 would involve construction of new defences, which would help to preserve the integrity of the designated sites / habitats in this location. Without new defences, there is a risk of erosion or a breach occurring at the eastern end of the unit, which could impact the designated sites at Sturt Pond / Hurst Spit (such as the SPA, SAC, Ramsar / Local Nature Reserve). Construction of new defences is likely to be in proximity to these designations, and further appraisal / design will be needed following the Strategy. However, there is generally expected to be space to avoid encroachment and habitat loss. There is potential for disruption from noise / vibration, but this can be mitigated by undertaking works during periods that are less sensitive to species in the location. Construction may also need to be avoided during the summer months, as the area is used for recreation and tourism, and bathing water quality is important. Opportunities for BNG should be explored during further appraisal / design, such as the use of materials / features on the seawall to encourage biodiversity and encouraging intertidal habitats on or within new groyne structures.

Option 6

Option 6 (Managed Realignment A) could lead to minor negative significant effects across several SEA topics, including landscape, population and communities, and transport and movement. Whilst the flood and erosion risk to properties would be reduced, these options are likely to lead to significant changes in the coastline. For example, the landscape could be changed considerably with a realignment coastline, and there could be loss of parking facilities / public open space (Hurst Road East car park provides the only access to the beach for people with mobility issues in the whole of the area). Similar positive effects to Options 4 and 5 (Improve A and B) would likely occur under the biodiversity and geodiversity SEA topic.

Option 7

Option 7 (Managed Realignment B) has a similar scoring and rationale to the Improve options. However, potential for a minor negative impact in the landscape category as nearshore breakwaters are likely to change the landscape of this area which is popular for amenity and recreation.

All Options

Uncertain effects are predicted under the historic environment SEA topic across all seven options, due to adjacency of Hurst Spit. Nevertheless, Historic England will be consulted in the future as options progress.

Neutral effects are also predicted under the land, soil and water resources SEA topic across all seven options because they are unlikely to impact these resources. This is because the land in this location is not used for

agricultural purposes, nor are there any historic landfill sites, drinking water protected areas/ safeguard zones, or source protection zones in this.

### 23.3.1 Cumulative effects

The options in ODU 18 are likely to have a strong functional relationship with coastal processes at the adjacent Hurst Spit to the east, which contains two grade II listed buildings and scheduled monument 'Hurst Castle and lighthouse'. Therefore, there is potential for both positive and negative cumulative effects with the Hurst Spit to Lymington Strategy depending on the option.

The options under ODU 18 that include beach nourishment (Options 4 and 5) could lead to positive cumulative effects with the Hurst Spit to Lymington Strategy. The dominant direction of movement for littoral transport is from west to east within the bay and therefore placing material in ODU 18 could have a benefit as some of this material would be expected to travel east towards Hurst Spit and provide a sediment feed over time. This could positively impact the management of the spit due to the greater supply of sediment to the area. Larger beach volumes on the spit are considered positive as the beach provides the first line of defence against erosion and flooding to assets on the Spit, such as Hurst Castle and Lighthouse which are scheduled monuments / listed buildings.

However, on the contrary, the Do Nothing and Do Minimum options would be expected to have negative cumulative effects on Hurst Spit. Under these options, once existing defences fail, the coastline would be expected to erode in an unconstrained manner. This risks a breach in the coastline occurring at the root of the spit adjacent to Sturt Pond. This could interrupt the sediment transport onto the spit and also lead to large morphological changes in the position of the spit over time, threatening a range of environmental receptors on the spit and in adjacent areas.

## 23.4 Leading Option selection

Multiple Leading Options were selected for ODU 18 based on the results of the economic, environmental, technical and social appraisal:

- National Economic Option: Improve A.
- Backup Options: Improve B and Maintain.

Delivery of the National Economic Option in this unit is likely to lead to positive significant effects across most SEA topics. However, funding for this option is uncertain, and if funding cannot be found, then a Backup option Improve B or Maintain may be delivered instead. The impacts of Improve B are similar to Improve A. The impacts with the Maintain option are more uncertain, as it is unclear how the existing defences will perform in the future. The Improve options will benefit the biodiversity and geodiversity SEA topic by helping to preserve the designated sites in the area, and there is potential to explore BNG opportunities during further appraisal / design.

# 24. What are the next steps?

## 24.1 Strategy updates and approvals

Following stakeholder review of the Strategy consultation materials, the Strategy will be updated and then submitted for BCP and NFDC council review and approval by the Environment Agency. This will involve the production of a Strategy Appraisal Report (StAR). Once approved, a Strategy action plan will be produced and the coastal management authorities will start planning for an implementing the leading options. Further appraisal of scheme solutions will be undertaken, during which design and appraisal of defence alignments will be undertaken alongside further engagement with key stakeholders.

## 24.2 Monitoring

The SEA regulations require 'measures envisaged concerning monitoring' to be outlined in this report. This refers to the monitoring of likely significant effects of the Strategy to identify any unforeseen effects early and take remedial action as appropriate.

It is anticipated that monitoring of effects of the Strategy will be undertaken by BCP / NFDC Councils and the Environment Agency as part of the process of preparing their Annual Monitoring Report (AMR). However, BCP / NFDC Councils and other key stakeholders could undertake additional monitoring specific to Flood and Coastal Erosion Risk Management and coastal change if budget and resources are available. Environmental monitoring that could be undertaken is outlined in Table 24-1 below.

**Table 24-1: Environmental Monitoring that could be undertaken to support delivery of Strategy**

| Category | Monitoring / further studies | Location |
|---|---|---|
| Historic environment | • BCP council, in consultation with Historic England, to develop specific monitoring plan for ODU 1 and ODU 6 to capture impacts of coastal change and undertake archaeological assessments. | ODU 1 and 6 |
| | • Monitoring of flood and erosion damage to historic assets, such as listed buildings and scheduled monuments | Historic assets impacted by flooding and/or erosion |
| | • Program of recording in erosion prone areas | Historical designations within near term erosion zones (i.e. epoch 1 and 2) |
| | • Heritage impact and archaeological assessment. Option appraisal study for heritage assets. | ODU 6 |
| Marine environment | • Develop monitoring programme to understand impacts of beach nourishment on biodiversity on beaches and nearshore waters in relation to planned renourishments | ODU 2, 12, 13, 16, 18 |
| Biodiversity and intertidal habitat | • Monitor condition of intertidal habitats and other key areas of biodiversity / habitats along the frontage to determine changes in condition and extent over time | Environmental designations and intertidal habitats (i.e. saltmarsh and mudflats) |
| Geodiversity | • Monitor exposure of geological features in cliff SSSI designation | Highcliffe to Milford Cliff SSSI |
| Historic landfill sites | • Monitor erosion rate of historic landfill sites and undertake assessment of potential for contaminated materials | ODU 3, 4, 5, 9, 11 |

# 25. Appendix A

# Christchurch Bay & Harbour FCERM Strategy

## Strategic Environmental Assessment (SEA) Scoping Report

Bournemouth, Christchurch and Poole (BCP) Council and New Forest District Council (NFDC) and the Environment Agency

Project number: 60656006

18 October 2023

Delivering a better world

## Quality information

| Prepared by | Checked by | Verified by | Approved by |
|---|---|---|---|
| Nicole Boakye<br>Consultant | Ben Taylor<br>Senior Consultant | Alastair Peattie<br>Associate Director | Jon Short<br>Associate Director |

## Revision History

| Revision | Revision date | Details | Authorized | Name | Position |
|---|---|---|---|---|---|
| 00 | 06/08/21 | Draft for Comment | JCAS | Jon Short | Associate Director |
| 01 | 19/11/21 | Updated with client and stakeholder comments | JCAS | Jon Short | Associate Director |
| 02 | 21/12/2021 | Minor text updates | JCAS | Jon Short | Project Manager |
| 03 | 16/10/2023 | Update with stakeholder comments | JCAS | Jon Short | Project Manager |

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# 1. Introduction

## 1.1 Christchurch Bay & Harbour FCERM Strategy

AECOM has been commissioned by Bournemouth, Christchurch and Poole (BCP) Council to develop a Flood and Coastal Risk Management (FCERM) Strategy for the coastal frontage at Christchurch Bay & Harbour (herein referred to as 'the Strategy'). The Strategy will be developed collaboratively by AECOM, and the Project Board consisting of officers of BCP Council, New Forest District Council (NFDC) and the Environment Agency (EA).

The Strategy extent is the coastal frontage between Hengistbury Head (immediately to the east of Hengistbury Head long groyne) and the landward (western) end of Hurst Spit. Within Christchurch Harbour, the Strategy extent is up to the tidal limit on the River Stour at Tuckton Bridge and up to the tidal limit on the River Avon at Knapp Mill (see Figure 1-1).

The aim of this Strategy is to provide an integrated plan for the Christchurch Bay & Harbour frontage, delivering sustainable and long-term management for coastal flood and erosion risks over the next 100 years. The Strategy will further develop the existing SMP policies adopted in 2011 and update the information provided in the 2012 Christchurch Bay & Harbour FCERM Study using the most up-to-date data and guidance.

The Strategy will provide an assessment of the risks and opportunities associated with coastal processes and develop a management framework to manage these risks, as well as any opportunities, in a sustainable manner. This will form an important element of the policy for flood and coastal defences and provide guidance for spatial planning within the coastal zone. The Strategy will determine the preferred options for flood and coastal defences through multi-variate appraisal including a cost-benefit analysis.

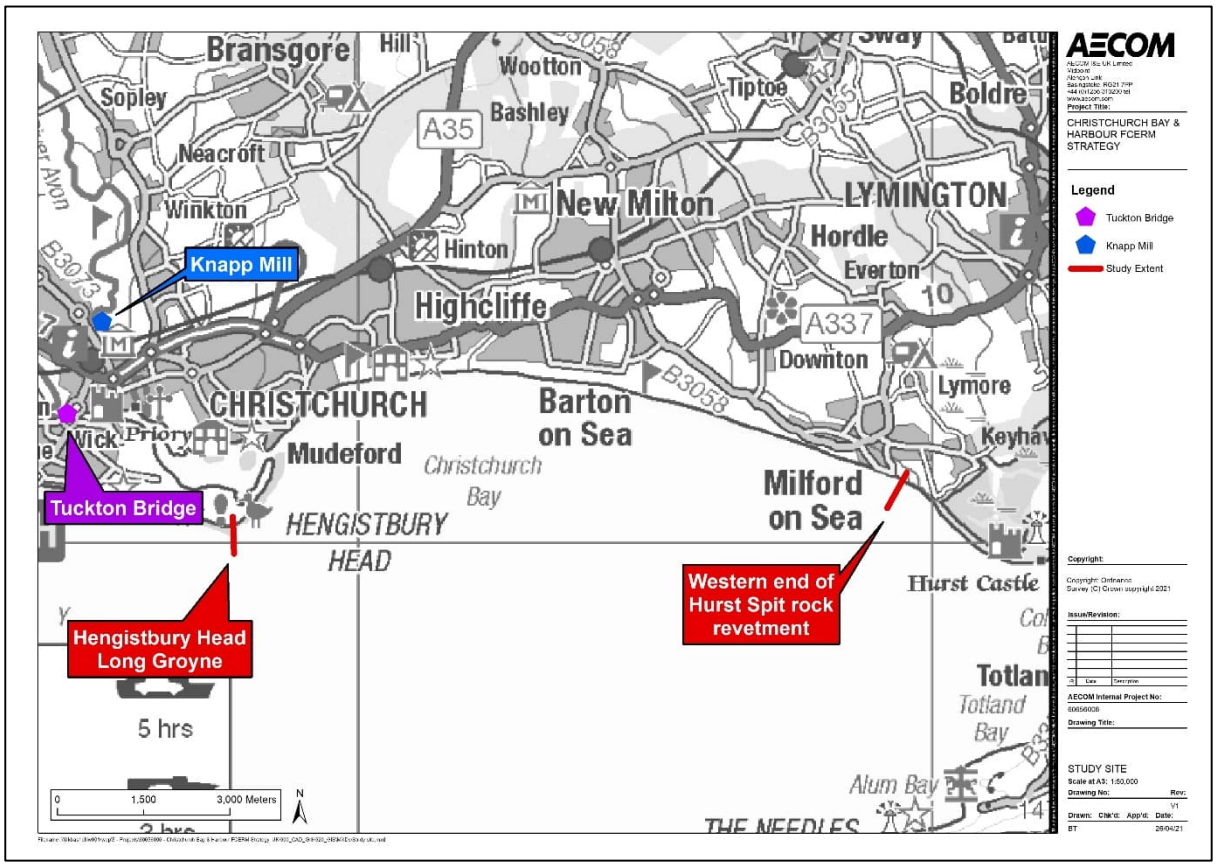


**Figure 1-1: Map of Strategy Area**

Figure 1-2 provides a summary of the Strategy development process. The Strategic Environmental Assessment (SEA) process will inform the Strategy, through identification of the likely significant effects of the implementation of the Strategy, and any reasonable alternatives, on relevant environmental receptors.

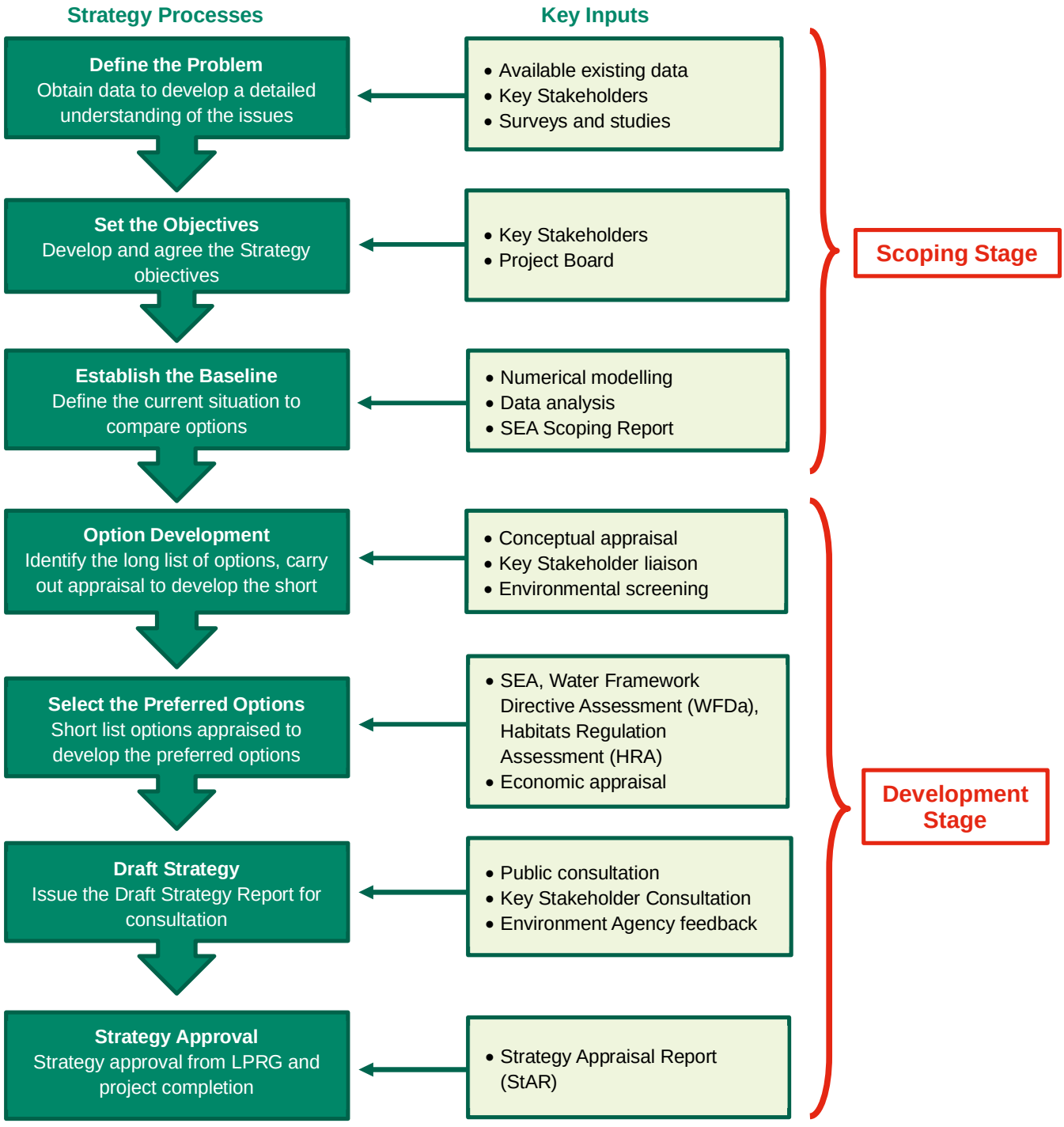


**Figure 1-2: Summary of the Christchurch Bay & Harbour FCERM Strategy Development Process**

## 1.2 Strategic Environmental Assessment

SEA is a mechanism for considering and communicating the likely significant effects of an emerging plan, and reasonable alternatives in terms of key environmental issues. The aim of a SEA is to inform and influence the plan-making process with a view to avoiding or mitigating negative environmental effects and maximising positive effects.

The Environmental Assessment of Plans and Programmes Regulations 2004 (otherwise known as the SEA Regulations) (SI 1633, 2004)[1] require an environmental assessment to be carried out on certain plans and programmes that are likely to have a significant effect upon the environment. Applying the SEA process to flood management plans, including any plan for medium to long-term river or coastal management, is not legally required. However, adopting the SEA approach is strongly encouraged by the Department for Environment, Food and Rural Affairs (DEFRA) to allow a strategic approach to managing the coast. As a result, a full SEA process is being carried out as part of the Christchurch Bay and Harbour FCERM Strategy which satisfies the requirements of the SEA Regulations.

After establishing that an SEA is required, the next stage seeks to establish the suggested scope for the SEA. This scoping stage is outlined in this report. A key procedural requirement of the SEA Regulations is to present this scope for the SEA, so that the designated authorities (Historic England, Natural England and the Environment Agency) can provide timely comment.

### 1.2.1 SEA Scoping

Developing the draft scope has involved the following tasks:

- Exploring the policy context for the Strategy and SEA through identification of other relevant plans, policies and strategies to summarise the key messages;
- Establishing the baseline of the SEA in order to provide the evidence base for the identification of environmental problems and to help in the identification of key issues;
- Identifying particular risks or opportunities, termed key issues, that should be a particular focus of the SEA; and,
- Developing an SEA framework comprising SEA objectives and assessment questions to address the key issues, which can be used as a guiding framework for the subsequent assessment.

### 1.2.2 Structure of this report

The outcomes of the scoping tasks set out above are presented under a series of SEA themes, as follows:

- Air Quality;
- Biodiversity and Geodiversity;
- Climate Change;
- Landscape;
- Historic Environment;
- Land, Soil and Water Resources;
- Population and Communities; and
- Transport and Movement.

These themes incorporate the 'SEA topics' suggested by Schedule 2 of the SEA Regulations[2]. Each of these themes is presented in Sections 2 to 9 with the context review, baseline data and identified environmental issues. As part of the next stage within the SEA Environmental Report, the cumulative effects between themes will be considered. This will include the cumulative impact of any plans, programmes and strategies on key receptors across the themes.

[1] Environmental Assessment of Plans and Programmes Regulations (2004) [online] available at: https://www.legislation.gov.uk/uksi/2004/1633/contents/made [Accessed 26 July 2021]

[2] The SEA Directive (Directive 200142//EC) does not require particular issues to be included, beyond 'the environment, including 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'.

The proposed SEA framework is presented in Appendix A. The SEA objectives for each of the SEA themes have been developed to align with the National FCERM Strategy[3] and the SEA Environmental Report for the Draft National FCERM Strategy[4].

[3] National Flood and Coastal Erosion Risk Management (FCERM) Strategy (2020) [online] available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920944/023_15482_Environment_agency_digitalAW_Strategy.pdf [Accessed 05 August 2021]

[4] Draft FCERM Strategy for England: Amended Strategic Environmental Assessment (SEA) Environmental Report (2019) [online] available at: https://consult.environment-agency.gov.uk/fcrm/national-strategy-public/user_uploads/sea-er-2019-amended-final-submission-for-client.pdf [Accessed 05 August 2021]

# 2. Air Quality

This section focuses on air quality and air pollution levels across the Strategy area.

## 2.1 Policy Context

Table 2-1 presents the most relevant documents identified for monitoring and managing air quality in the Strategy area.

**Table 2-1: Plans, policies and strategies reviewed in relation to air quality**

| Policy | Year of publication | Weblink |
|---|---|---|
| **National Planning Policy Framework (NPPF)** | 2021 | https://www.gov.uk/government/publications/national-planning-policy-framework--2 |
| **Environment Bill 2020** | 2020 | https://www.gov.uk/government/publications/environment-bill-2020 |
| **Water Environment (Water Framework Directive) (England and Wales) Regulations 2017** | 2017 | https://www.legislation.gov.uk/uksi/2017/407/contents/made |
| **The Clean Air Strategy** | 2019 | https://www.gov.uk/government/publications/clean-air-strategy-2019 |
| **A Green Future: Our 25 Year Plan to Improve the Environment** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf |
| **South Inshore and South Offshore Marine Plan** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726867/South_Marine_Plan_2018.pdf |
| **Dorset Heathlands Interim Air Quality Strategy** | 2021 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Bournemouth/Docs/Air-Quality-mitigation-FINAL-1.pdf |
| **Bournemouth Local Plan** | 2012 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Bournemouth/Docs/Core-Strategy-1.pdf |
| **Christchurch and East Dorset Local Plan** | 2014 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Christchurch/docs/christchurch-and-east-dorset-adopted-core-strategy.pdf |
| **New Forest District Council Local Plan 2016 - 2036** | 2020 | https://www.newforest.gov.uk/media/705/Local-Plan-Document-2016-2036/pdf/Local_Plan_2016-2036_Part_One_FINAL.pdf?m=637329191351130000 |
| **New Forest National Park Local Plan 2016 - 2036** | 2019 | https://www.newforestnpa.gov.uk/app/uploads/2019/09/Local-Plan-2016-2036-finalforweb.pdf |
| **New Forest District Council: 2020 Air Quality Annual Status Report** | 2020 | https://www.newforest.gov.uk/media/1129/Air-Quality-Annual-Status-Report-Summary-2020/pdf/Air_Quality_Annual_Status_Report_Summary_2020.pdf?m=637357085023900000 |

| Policy | Year of publication | Weblink |
|---|---|---|
| **BCP Council: 2020 Air Quality Annual Status Report** | 2020 | https://www.bournemouth.gov.uk/environment-and-sustainability/air-quality/documents/2020-annual-status-report.pdf |

Any flood and coastal erosion management schemes that are recommended by the Strategy and require planning permission will be required to adhere to the NPPF, which seeks to reduce and mitigate air quality impacts associated with development, including opportunities to improve air quality. It will also be necessary to conform with the Local Plans for Bournemouth, Christchurch, Poole, New Forest District Council, and the New Forest National Park, according to the annual status reports for air quality. Following royal assent of the emerging Environment Bill, new developments will also be required to adhere to air quality regulations and $PM_{2.5}$ targets.

The South Inshore and South Offshore Marine Plan also includes a policy which requires all development proposals to assess their impacts on local air quality, and states they will not be supported if they cannot avoid, minimise or mitigate air pollution in line with national and local objectives.

The Dorset Heathlands Interim Air Quality Strategy has been developed to address the adverse effect of airborne nitrogen ($NO_x$) on the Dorset Heathlands, including Dorset Heathlands Special Protection Area (SPA) and Dorset Heaths Special Area of Conservation (SAC), which are partially located within the Strategy area.

## 2.2 Current Baseline

The policy context has identified that there are no declared AQMAs within the Strategy area, although there is a strategy to reduce the effects of $NO_x$ on the Dorset Heathlands. The main pollutant of concern across both BCP Council and NFDC is nitrogen dioxide emissions from traffic congestion. In Christchurch, the concentration of Nitrogen dioxide in June 2021[5] was approximately 35ug/$m^3$, compared to the annual mean objective of less than 40ug/$m^3$.

Monitoring results indicated that in the Christchurch area there have been no significant changes in the concentration of Nitrogen dioxide between 2015 and 2019. Similarly in the NFDC area, between 2015 and 2019 there was no monitored exceedance of any Air Quality Objectives at the locations identified for exposure.

## 2.3 Future Baseline

Future change in coastal flooding and erosion has the potential to damage existing road networks in the Strategy area, which could lead to other roads in the BCP Council and NFDC areas becoming more congested through increased traffic flows, leading to higher vehicle emissions. However, the amount of coastal flooding and erosion is not expected to lead to significant changes in the current baseline.

There is also potential for temporary localised changes in air quality, arising from the construction of coastal defences which require heavy machinery. However, this is not likely to lead to significant changes in the current baseline, even for short periods of time.

The air quality in the Strategy area has the potential to improve from reduced vehicle emissions, through initiatives and investments proposed through the Local Transport Plans for Bournemouth, Poole and Dorset[6] and Hampshire driving towards more sustainable methods of transport such as cycling and electric vehicles. This supports the UK's overarching aim of phasing out the sale of new combustion engine cars by 2030, and all new cars and vans having zero emissions by 2035.

## 2.4 Key Issues

There are no AQMAs in the Strategy area, or areas known to exceed national objectives for air quality. The main pollutant of concern in the Strategy area is nitrogen dioxide, largely related to emissions from vehicles due to traffic and congestion. Though traffic and congestion have the potential to increase vehicle emissions and reduce air

[5] Air Quality England (2021) New Forest District Council Monitoring Data [online] available at: https://www.airqualityengland.co.uk/local-authority/?la_id=236 [Accessed 15 June 2021]
[6] Dorset Council (2012) Bournemouth, Poole and Dorset Transport Plan [online] available at: https://www.dorsetcouncil.gov.uk/roads-highways-maintenance/documents/improvements-and-transport-planning/ltp3-bournemouth-poole-dorset-summary-document-final.pdf [Accessed 02 July 2021]

quality in the area, the effects of the Strategy on transport are discussed in further detail in Section 9, including the potential of the Strategy to improve and support sustainable travel throughout the Strategy area.

## 2.5 Scoping Outcome

In the absence of any specific air quality issues and that the Strategy is not likely to significantly affect this theme in the future, the **Air Quality theme has been scoped out** for the purposes of the SEA process.

# 3. Biodiversity and Geodiversity

This section focuses on nature conservation designations, habitats, species, geology, palaeontology and geomorphology within the Strategy area.

## 3.1 Policy Context

Table 3-1 presents the most relevant documents identified for managing the natural environment in the Strategy area.

**Table 3-1: Plans, policies and strategies reviewed in relation to biodiversity and geodiversity**

| Policy | Year of publication | Weblink |
|---|---|---|
| **The Conservation of Habitats and Species Regulations 2017 (as amended)** | 2017 | https://www.legislation.gov.uk/uksi/2017/1012/contents/made |
| **The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019** | 2019 | https://www.legislation.gov.uk/ukdsi/2019/9780111179512/contents |
| **Water Environment (Water Framework Directive) (England and Wales) Regulations 2017** | 2017 | https://www.legislation.gov.uk/uksi/2017/407/contents/made |
| **The Wildlife & Countryside Act** | 1981 | https://www.legislation.gov.uk/ukpga/1981/69/pdfs/ukpga_19810069_en.pdf |
| **The Ramsar Convention on Wetlands of International Importance** | 1971 | https://www.ramsar.org/ |
| **Natural Environment and Rural Communities Act 2006** | 2006 | https://www.legislation.gov.uk/ukpga/2006/16/section/41 |
| **Environment Bill 2020** | 2020 | https://www.gov.uk/government/publications/environment-bill-2020 |
| **Convention on Biological Diversity: Strategic Plan for Biodiversity 2011–2020 and the Aichi Targets** | 2014 | https://www.cbd.int/sp/ |
| **National Flood and Coastal Risk Management Strategy for England** | 2020 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920944/023_15482_Environment_agency_digitalAW_Strategy.pdf |
| **National Planning Policy Framework (NPPF)** | 2021 | https://www.gov.uk/government/publications/national-planning-policy-framework--2 |
| **A Green Future: Our 25 Year Plan to Improve the Environment** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf |

| Policy | Year of publication | Weblink |
|---|---|---|
| **Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services** | 2011 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf |
| **Natural Environment White Paper** | 2014 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/366526/newp-imp-update-oct-2014.pdf |
| **Nature Recovery Network** | 2020 | https://www.gov.uk/government/publications/nature-recovery-network/nature-recovery-network |
| **Poole & Christchurch Bays Shoreline Management Plan (SMP2)** | 2010 | http://www.twobays.net/index.htm |
| **South Inshore and South Offshore Marine Plan** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726867/South_Marine_Plan_2018.pdf |
| **South East River Basin District River Basin Management Plan** | 2016 | https://www.gov.uk/government/publications/south-east-river-basin-district-river-basin-management-plan |
| **South West River Basin District River Basin Management Plan** | 2016 | https://www.gov.uk/government/publications/south-west-river-basin-district-river-basin-management-plan |
| **The Great Britain Invasive Non-native Species Strategy** | 2015 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/455526/gb-non-native-species-strategy-pb14324.pdf |
| **Dorset Biodiversity Strategy** | 2003 | https://dorsetlnp.org.uk/wp-content/uploads/2019/01/Dorset-Biodiversity-Strategy-2003.pdf |
| **Dorset's Ecological Networks** | 2020 | https://dorsetlnp.org.uk/wp-content/uploads/2020/11/Ecological-Networks-Guidance-2020.pdf |
| **Dorset Heathlands Planning Framework Supplementary Planning Document 2020 - 2025** | 2020 | https://www.dorsetcouncil.gov.uk/planning-buildings-land/planning-policy/supplementary-planning-documents-and-guidance/all-of-dorset/dorset-heathlands-planning-framework-update/dorset-heathlands-2020-2025-spd-adopted.pdf |
| **Bournemouth Local Plan** | 2012 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Bournemouth/Docs/Core-Strategy-1.pdf |
| **Christchurch and East Dorset Local Plan** | 2014 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Christchurch/docs/christchurch-and-east-dorset-adopted-core-strategy.pdf |
| **New Forest District Council Local Plan 2016 - 2036** | 2020 | https://www.newforest.gov.uk/media/705/Local-Plan-Document-2016-2036/pdf/Local_Plan_2016-2036_Part_One_FINAL.pdf?m=637329191351130000 |

| Policy | Year of publication | Weblink |
|---|---|---|
| **The Climate and Ecological Emergency Action Plan** | 2019 | https://democracy.bcpcouncil.gov.uk/documents/s14048/Response%20to%20Climate%20and%20Ecological%20Emergency.pdf |

There are several designated sites in the Strategy area which have international and national importance, protected by the policies in Table 3-1. The Conservation of Habitats and Species Regulations 2017 and the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, transposed from EU Directives, seek to conserve habitats and species of European importance, taking measures to maintain or restore natural habitats and species at a favourable conservation status. Similarly, the Ramsar Convention on Wetlands of International Importance seeks to conserve and promote the sustainable use of wetlands. At the national level there is both legislation and guidance in relation to the conservation of biodiversity. The Wildlife & Countryside Act (1981) provides for the protection of Sites of Special Scientific Interest (SSSI) and protects listed species.

In accordance with the National FCERM Strategy for England, and the FCERM Appraisal Guidance (FCERM-AG), FCERM strategies are encouraged to find nature-based solutions to coastal management, protecting the natural environment. Measure 2.2.1 states that from 2021, all flood and coastal defence projects and programmes must deliver biodiversity gain and seek to encourage other environmental benefits. Biodiversity net gain is defined by the Department for Environment, Food and Rural Affairs (DEFRA) as 'an approach to development that aims to leave the natural environment in a measurably better state than it was before'. This may include restoration, recovery and re-connection of habitats in intertidal areas of the coastline to enhance and protect the natural environment. This approach avoids the loss of biodiversity and supports the provision of ecosystem services such as health and wellbeing.

The South Inshore and South Offshore Marine Plan (HM Government, 2018) includes similar policies to ensure that new development proposals deliver biodiversity gains for fish habitats as well as conserving, restoring and enhancing coastal habitats. Both the South East and South West River Basin Management Plans (DEFRA, 2016) also include aims for enhancing biodiversity through river restoration and improvements to estuarine and coastal waters.

Any flood and coastal erosion management schemes that are recommended by the Strategy and require planning permission will be required to adhere to the NPPF, which emphasises the importance of improving biodiversity and measurable net gain in development. This includes a strategic approach to maintaining and enhancing marine and terrestrial habitats at a larger scale, through strategic options such as managed realignment, to create more sustainable resilient environments for the future. This Strategy should also refer to the policies set out in the Poole and Christchurch Bays SMP2, where there are impacts on biodiversity through managed realignment.

Biodiversity 2020 (DEFRA, 2011) demonstrated a new way of working towards protecting biodiversity, by focusing on strategic management of the natural environment. As part of the Natural Environment White Paper (DEFRA, 2014) a new biodiversity strategy is to be published. This is supported in the 25 Year Environmental Plan (HM Government, 2018), which emphasises improvements to the natural environment and working at a landscape level to connect habitats into larger corridors for wildlife. The Nature Recovery Network (NRN) is a part of this strategy, which aims to enhance wildlife and habitat connectivity.

Any developments along the coastline of the Strategy area should also aim to protect biodiversity by limiting the spread of Invasive Non-native Species (INNS). The Invasive Non-native Species Strategy (Great Britain Non-native Species Secretariat, 2015) aims to protect biodiversity, quality of life and economic interests against the adverse impacts of INNS. This includes minimising the risk of INNS becoming established in a new environment, and managing the potential impacts of the establishment of INNS. Any schemes developed as part of this Strategy will consider the impact of INNS, and show compliance with good biosecurity practices.

The emerging Environment Bill will provide further provisions in relation to biodiversity when granted royal assent. The Bill will set parameters for biodiversity net gain as a condition of planning permission, as well as biodiversity net gain site registers and biodiversity credits. The Bill identifies a general duty to conserve and enhance biodiversity, including through biodiversity reports and local nature recovery strategies. Further to this, the Aichi Biodiversity Targets (developed as part of the Convention on Biological Diversity Strategic Plan 2011 – 2020), detail five strategic goals for addressing biodiversity loss and enhancing the natural environment including ecosystem restoration.

The existing Bournemouth, Christchurch, NFDC and New Forest National Park Local Plans contain policies directly relating to biodiversity and geodiversity, encouraging the provision of a sustainable environment. BCP Council declared a climate and ecological emergency in 2019, developing the Climate and Ecological Emergency Plan to set out future plans including working with local wildlife groups to support large scale wildlife conservation for

Christchurch Harbour. NFDC has produced interim guidance on ecology and biodiversity net gain, which details how all new build developments will be required to deliver biodiversity net gain to make positive environmental impacts.

Similarly, the Dorset Biodiversity Strategy (Dorset Biodiversity Partnership, 2003) sets out a programme of actions for the variety of habitats within the county to protect and enhance biodiversity. Dorset's Ecological Networks (Dorset Local Nature Partnership, 2020) present the value of connectivity between habitats of wildlife importance in accordance with the NPPF, which are used to inform Local Plan policies and protect natural environments by limiting development. Further to this the Dorset Heathlands Planning Framework 2020 - 2025 Supplementary Planning Document (SPD) sets out a strategy for the avoidance and mitigation of impacts of development upon the Dorset Heathlands, including restrictions within 400m of Heathland and mitigation within 5km.

## 3.2 Current Baseline

Christchurch Bay falls within the Solent and Poole Bay Maritime Natural Area, which has its own characteristic of wildlife and natural features. The Natural Area extends inland to all habitats with a coastal influence and offshore to the 12 mile territorial limit. The area has important natural lengths of coast, with unusual transitions from semi-aquatic, freshwater/brackish and marine habitats which combine to form a varied stretch of open coast. Significant features in the Bay include:

- Coastal sand dunes;
- Coastal saltmarsh;
- Coastal vegetated shingle;
- Earth heritage;
- Inshore sublittoral rock;
- Maritime cliff and slopes;
- Reedbeds; and,
- Saline Lagoons.

The cliffs between Highcliffe and Milford-on-Sea are of national importance and are potentially internationally significant because of the underlying geology. This includes:

- The cliffs between Highcliffe and Milford-on-Sea;
- The coastal section from Friars Cliff to Milford on Sea; and,
- Hordle Cliff.

### 3.2.1 Designated Sites

Parts of the coastline at Christchurch Bay & Harbour are designated as conservation areas; they are recognised as having important biodiversity, geology and landscapes. These sites can be designated through domestic and international regulations, both statutory and non-statutory. Designated sites can be used to ensure the protection of the natural environment and control environmentally sensitive areas of the coast with other legislation and regulations, including voluntary management agreements.

The coastline along Christchurch Bay and Harbour features many sites of international and national nature conservation, geological and landscape importance which is reflected in the statutory and non-statutory site designations. Table 3-2 provides definitions of the sites designated for nature conservation within the Strategy area with a summary of the characteristics. The extents of the designations are shown in Figure 3-1 (not including Geological Conservation Review Sites or Sites of Nature Conservation Interest (SNCIs) in Dorset or Sites of Importance for Nature Conservation (SINCs) in Hampshire).

**Table 3-2: Designated sites for nature conservation and geology within the Strategy area**

| Level | Type of Designation | Site | Reason for Designation |
|---|---|---|---|
| **European Designation** | **Special Areas of Conservation (SAC)** Designated under the EU Habitats Directive and implemented in the UK through the Conservation Regulations 1994 to protect habitats / species of European importance. | The Solent Maritime (overlapping the Strategy area) | • Estuaries – the site encompasses a major estuarine system, with four coastal plain estuaries and four bar-built estuaries. This site is the only one to contain more than one physiographic sub-type of estuary and the only cluster site, making it unique in England and Europe.<br>• Cordgrass swards – the only site in the UK for smooth cord-grass *Spartina alterniflora* in the UK, and is one of the only two sites where significant amounts of small cord-grass *S. maritima* are found.<br>• Atlantic salt meadows – the second largest aggregation in the south and south-west of England, composed of large areas of saltmarsh.<br>• Coastal lagoons as a priority feature. |
| | | Dorset Heaths (within the Strategy area) | This site extends into the western boundary of the Strategy area at Hengistbury Head, featuring areas of maritime heathland and grassland. This includes North Atlantic wet heaths and European dry heaths. |
| | | Avon River (overlapping the Strategy area) | The River Avon is a large, lowland river system with sections running through chalk and clay, featuring river water-crowfoot (*Ranunculion fluitantis*) vegetation. |
| | | South Wight Maritime (outside of the Strategy area) | This site is located outside of the Strategy area, on the southern coast of the Isle of Wight. The site features subtidal reefs that support a diverse range of species in both subtidal and intertidal, as well as vegetated sea cliffs and sea caves. |
| | **Special Protection Areas (SPA)** Designated under the EU Birds Directive, and implemented in the UK by the Wildlife and Countryside Act 1981 and the Conservation Regulations 1994. | Solent and Southampton Water (overlapping the Strategy area) | This site extends from Hurst Spit to Lee-on-the-Solent, along the south coast of Hampshire and the north coast of the Isle of Wight. The site qualifies under Article 4.1 of the EU Birds Directive, regularly supporting nationally important breeding populations of:<br>• Little tern (*Sterna albifrons*) 40 pairs (1.6% of the British population);<br>• Sandwich tern (*Sterna sandvicensis*) 162 pairs (1.2% of the British population);<br>• Common tern (*Sterna hirundo*) 262 pairs (2.0% of British population);<br>• Roseate tern (*Sterna dougalli*) average of 4 pairs (3.6% of British population).<br>The site also qualifies under Article 4.2 as a wetland of international importance by regularly supporting over 20,000 waterfowl in winter and internationally important numbers of wintering migratory waterfowl:<br>• Dark-bellied brent geese (*Branta bernicla bernicla*) 7.2% of British population & 2.9% of NW European;<br>• 704 black-tailed godwit (*Limosa limosa*) 9l.4% of British, 1.0% of east Atlantic flyway population. |
| | | Dorset Heathlands (within the Strategy area) | This site extends to the Avon Valley, bordered by the Wessex Downs to the north and west, and by the Purbeck chalk ridge to the south. The site qualifies under Article 4.1 of the EC Birds Directive by supporting nationally important breeding populations of three species listed on the Annex 1 of the Directive; Nightjar (*Caprimulgus europeaus*) (13% of the British population); Woodlark *(Lullula arborea*) 56 pairs (16% of the British population); Dartford warbler (*Sylvia undata*) (38% of the British population). |

| Level | Type of Designation | Site | Reason for Designation |
|---|---|---|---|
| | | | The site also qualifies under Article 4.1 by supporting up to 20 hen harrier (*Circus cyaneus*) and 15 merlin (*Falco columbaris*), approximately 2% and 1% respectively of the British wintering population, both Annex 1 species. |
| **European Designation** | **Special Protection Areas (SPA)**<br>Designated under the EU Birds Directive, and implemented in the UK by the Wildlife and Countryside Act 1981 and the Conservation Regulations 1994. | Avon Valley (overlapping the Strategy area) | This site encompasses the lower reaches of the River Avon and its floodplain between Bickton and Christchurch. It supports a nationally important assemblage of breeding wetland birds and is especially important for breeding waders associated with lowland wet grassland. The site qualifies under:<br>• Article 4.1 for supporting nationally important numbers of Annex 1 species Bewick swan (*Cygnus bewickii*), an average of 156 in the five year period 1988/89 to 1992/93, representing 2.2% of the population;<br>• Article 4.2 for supporting internationally important wintering populations of gadwall (*Anas strepera*) and nationally important wintering populations of the white fronted geese (*Anser albifrons albifrons*), pochard (*Aythya ferina*) and coot (*Fulica atra*).<br>A nationally important assemblage of breeding birds is also associated with the lowland open water and its margins. |
| | | Solent and Dorset Coast (overlapping the Strategy area) | This site encompasses four existing SPAs, including the Solent and Southampton Water SPA. It includes sub-tidal areas which are not encompassed by the other SPAs.<br>It has been designated under Article 4 for regularly supporting more than 1% of the Great Britain populations of three breeding tern species: Sandwich tern (*Sterna sandvicensis*), Little tern (*Sternua albifrons*) and Common tern (*Sterna hirundo*). |
| | **Ramsar**<br>Designated under the Ramsar Convention on Wetlands of Importance. | Solent and Southampton Water (overlapping the Strategy area) | The site extends from Hurst Spit to Gilkicker Point along the south coast of Hampshire and along the north coast of the Isle of Wight. The site qualifies under the following aspects of the Ramsar Convention:<br>• Criterion 1a - contains good and representative e.g. of wetland habitats characteristic of the biogeographical region including saline lagoons, saltmarshes, estuaries and reefs;<br>• Criterion 2a - supports important assemblage of rare plants and invertebrates (including 39 red data book (RDB) invertebrates and 8 RDB plants);<br>• Criterion 2c - important staging area for migratory waterfowl (notably black-tailed godwit *Limosa limosa*);<br>• Criterion 3a - regularly supports over 20,000 waterfowl in winter.<br>The site also qualifies under Criterion 3c for the same reasons as those given for SPA qualification under Article 4.2 above. |
| | | Avon Valley (overlapping the Strategy area) | The boundaries of the Ramsar Site largely follow those of the Avon Valley SPA. The site qualifies under:<br>• Criterion 1a – a greater range of habitats than any other chalk river in Britain including fens and mires, lowland wet grassland and small areas of woodland. The diversity of habitats supports a notable assemblage of breeding wetland birds and provides roosting and feeding areas for an important assemblage of wintering wildfowl;<br>• Criterion 2a – supports a diverse assemblages of wetland plants and animals, including several nationally rare species, including two wetland RDB plants and four wetland RDB invertebrate species;<br>• The site also qualifies under Criterion 3c for the same reasons as those given for SPA qualification under Articles 4.2 and 4.3 of the Birds Directive. |

| Level | Type of Designation | Site | Reason for Designation |
|---|---|---|---|
| **National Designation** | **Site of Special Scientific Interest (SSSI)** Sites notified by English Nature, which represent some of the best examples of Britain's natural features. Designated under the Wildlife & Countryside Act 1981. | Hurst Castle and Lymington River (located outside of the Strategy area) | This site is designated for its ecology and geomorphology. It extends along 9km of the north west Solent shore. The SSSI below the seawall comprises the estuaries of three substantial streams, intertidal muds, cord-grass marshes and high level mixed saltmarsh. Behind the seawall is a belt of marsh including a series of lagoons.<br><br>The site supports nationally important populations of black-headed gulls (*Larus ridibundus*), black-tailed godwit (*Limosa limosa*) and three species of tern which are listed under Annex 1 of the EU Directive on the Conservation of wild birds. This is also an important habitat for internationally important over-wintering populations of wildfowl and waders, including dark-bellied brent geese (*Branta bernicla bernicla*).<br><br>Condition of the site: 21.46% favourable, 75.67% unfavourable – recovering and 2.88% unfavourable – declining. |
| | | Highcliffe to Milford Cliffs (within the Strategy area) | The site is designated for its geology and as a key site for European Tertiary palaeobotany and palaeoecology (see Section 5 for further detail). It extends for 9km along the cliffs of Christchurch Bay and comprises steep coastal slopes and cliffs, which are locally dissected by deeply incised ravines. The site contains the standard succession of the fossil rich Barton Beds and Headon Beds, various exposures of which are of national and international importance.<br><br>All Geological Conservation Review Sites identified below have statutory protection through this SSSI designation.<br><br>Condition of the site: 44.02% favourable, 55.98% unfavourable – no change. |
| | | Christchurch Harbour (within the Strategy area) | The site is designated for its ecology and geology. It comprises the drowned estuary of the Rivers Stour and Avon and the peninsula of Hengistbury Head. The varied habitats include saltmarsh, wet meadows, drier grassland, heath, sand dune, woodland and scrub. This site is rich in invertebrates, with 260 species of beetle recorded as well as a number of nationally rare hoverflies and dragonfly. The site is also important for supporting a number of rare breeding and wintering bird species.<br><br>Condition of the site: 80.56% favourable and 19.44% unfavourable – recovering. |
| | | Avon River (overlapping the Strategy area) | This site is designated for its ecology, occupying 11km of the lower River Avon, its flood plain and some of the associated river terraces. The River Avon system shows a greater range of habitat diversity and a more diverse flora and fauna than any other range of chalk river in Britain. The flood plain within the SSSI comprises a variety of habitats ranging from herb rich hay meadows and pastures to flood meadows, relic bog, riparian woods and river terraces.<br><br>The lower Avon valley grasslands are used as feeding grounds by large flocks of the white fronted geese (*Anser albifrons albifrons*), Bewick swan (*Cygnus bewickii*) and black-tailed godwit (*Limosa limosa*).<br><br>Condition of the site: 2.82% favourable, 7.46% unfavourable – recovering, 85.61% unfavourable – no change and 4.10% unfavourable – declining. |

| Level | Type of Designation | Site | Reason for Designation |
|---|---|---|---|
| | **Marine Conservation Zone (MCZ)** Sites notified by DEFRA, JNCC and Natural England which protect a range of nationally important, rare or threatened habitats and species in territorial and offshore waters. Designated under UK Ministerial Orders. | The Needles (outside of the Strategy area) | This site is located outside of the Strategy area, adjacent to the northwest side of the Isle of Wight just south of the needles and includes a series of sheltered bays. The MCZ protects a number of rare and fragile habitats, including chalk on the seabed, shallow water (infralittoral) rock and soft sediments which support communities of algae, sponges, sea squirts and delicate anemones. It is a highly productive area biologically and important spawning and nursery area with a range of fish species including common smelt, bass, sole, pout and mullet; lobsters and whelks are also known to occur here. |
| **National Designation** | **Geological Conservation Review Sites (GCR)** Areas containing geological and geomorphological features of national and international importance. Designated under the Wildlife & Countryside Act 1981, they often have statutory protection through designation in SSSIs. | Paddy's Gap (within the Strategy area) | This site shows the thin Limnocarpus Band, within the Eocene Headon Beds, crowded with the fruits of an extinct pondweed relative, to the exclusion of almost all other plant fossils. This is the only site now exposing this horizon. |
| | | Highcliffe (within the Strategy area) | This is the only locality with a diverse flora from the Boscombe Sands of Eocene age. Over fifty species have been recorded, and this is the type locality for fourteen species and two genera. Eleven species and three genera are unique to this site within Britain. |
| | | Friars Cliff (within the Strategy area) | Composed of marginal marine sediments deposited during the regressive phase of the Auversian (Upper Bracklesham) and the earliest, marine transgressive phase of the Bartonian, the section provides a unique exposure of distributary mouth-bar sequences in the uppermost Bracklesham Beds. |
| | | Barton (within the Strategy area) | The site yields fossil plants from lower Barton Beds (of early late Eocene age). At least twenty-eight plant species occur, and the make-up of the flora here reveals the first indication of the climatic cooling which affected Britain in later Tertiary times. |
| **Local / Regional Designation** | **Local Nature Reserve (LNR)** Established by Local Authorities with English Nature, these sites are of local significance. | Stanpit Marsh (within the Strategy area) | This site is designated for grazing marsh and is located at the north side of Christchurch Harbour. It features salt marsh, reed beds, freshwater marsh, gravel estuarine banks and sandy scrub. It is also a habitat for 313 bird species and Natterjack toads. |
| | | Hengistbury Head (within the Strategy area) | This site comprises a range of habitats including heathland, woodland, reedbed, saltmarsh and sand dunes. It is located at the western end of the Strategy area, with Christchurch Harbour immediately to the north. A quarter of all of Britain's plant species can be found here, along with rare animals such as Natterjack toads and the Dartford warbler. |
| | | Steamer Point (within the Strategy area) | This site is designated for broadleaf woodland, pond and grassland habitats. It is located between Highcliffe Castle and Friar's Cliff on the Christchurch coastline, with some areas overlapped by Highcliffe to Milford Cliffs SSSI. |
| | | Milford on Sea (within the Strategy area) | This site is designated for its ancient woodland with a large meadow in the Western corner, which follows the Dane Stream. |
| | | Sturt Pond (overlapping the Strategy area) | This site is located at Hurst Road, Milford on Sea. It includes the reed beds either side of the Dane Stream, the tidal Sturt Pond, lagoons and saltmarsh. All of these habitats attract a range of bird species, with a bird hide found at the end of Milford Beach and the beginning of Hurst Spit. |

| Level | Type of Designation | Site | Reason for Designation |
|---|---|---|---|
| | **Sites of Importance for Nature Conservation (SINC) Hampshire**<br>Defined by Wildlife Trusts and Local Authorities as sites of local nature conservation interest. | Barton Common (within the Strategy area) | Heathland |
| | | Sturt Pond (overlapping the Strategy area) | Semi-natural coastal habitat |
| | | Studland Common (within the Strategy area) | Unimproved grassland |
| | | Becton Bunny (within the Strategy area) | Heathland |
| | **Sites of Nature Conservation Interest (SNCIs) Dorset**<br>Defined by Wildlife Trusts and Local Authorities as sites of local nature conservation interest. | Hengistbury Head (within the Strategy area) | Sand dunes, gravel and shingle foreshore |
| **Local / Regional Designation** | | Mudeford Quay (within the Strategy area) | Dry ruderal grassland |
| | | Stanpit (within the Strategy area) | Semi-improved grassland and fen |
| | | Stony Lane Drain (within the Strategy area) | Wet grassland and ditch |
| | | Mude Valley (within the Strategy area) | Woodland |
| | | Chewton Bunny (within the Strategy area) | Deciduous woodland |

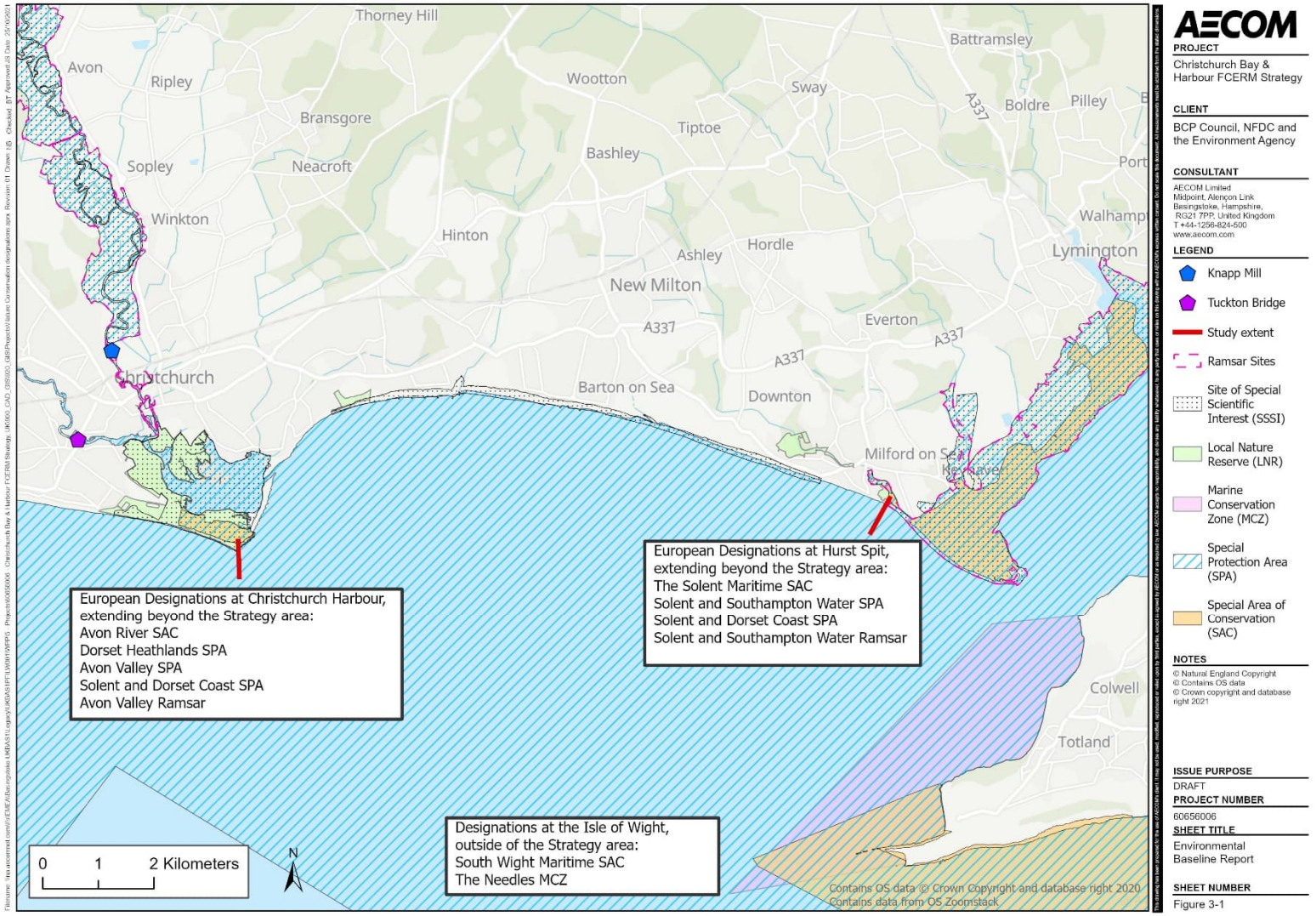


**Figure 3-1: European and Nationally Designated Nature Conservation Sites in the Strategy area**

### 3.2.2 Coastal Habitats

The coastal cliffs in the Strategy area form a habitat associated with soft cliffs, due the vegetation that covers the majority of the cliffs. This includes species such as willow (*Salix spp*.), reeds (*Phragmites australis*), reedmace (*Typha spp.*) (within soft cliffs) and coltsfoot (*Tussilago farfara*). These cliffs provide habitats for a range of invertebrates. In some areas where the cliffs have less vegetation, there is more active erosion.

Hengistbury Head comprises a mosaic of habitats ranging from dunes and maritime cliff-top grassland (neutral to acidic) to scrub, heathland and woodland. On the Christchurch Harbour side of the spit, there are areas of saltmarsh and extensive reedbeds. Mudeford sandbank supports populations of sea daffodil (*Pancratium maritimum)*, sea kale (*Crambe maritima)* and yellow horned poppy (*Glaucium flavum)*. Hengistbury Head also supports species of sand lizard (*Lacerta agilis),* natterjack toad (*Epidalea calamita*) and Dartford warbler (*Curruca undata*).The beach at Hurst Spit is mainly composed of shingle, which supports vegetation that has grown in extent and richness over the past 4-years. The shingle ridges at Hurst Spit support an important flora which is dependent on the substrate. Intertidal mudflats, cord-grass marshes and level mixed saltmarsh occur to the north of Hurst Spit and around Sturt Pond. These areas support large breeding and over-wintering populations of wildfowl and other birds. There is a spatial variation in the recovery of vegetated shingle species here following storms and beach management activities. Current beach management activities aim to avoid disturbing these areas as much as possible.

Christchurch Harbour contains a wide range of habitats including shallow mudflats, saltmarsh, reed beds, ditches, wet meadows, sand dunes, dry and neutral grassland, heath, woodland and scrub. These habitats support diverse plant and animal communities, and the site is of great ornithological importance.

The River Avon is an ecologically important chalk river that drains into Christchurch Harbour. The Avon Valley shows a greater range of habitats and a more diverse flora and fauna than any other chalk river in Britain.

### 3.2.3 Marine Environment

An ironstone reef stretches 5km out into Christchurch Bay from the east of Hengistbury Head, forming the Christchurch Ledges. The Ledges provide a solid substrate in an area dominated by mobile sandy sediments, which support diverse assemblages of kelp and other algae, along with a variety of animals including nationally rare fish (gobies), bryozoans, sponges and anemones.

Offshore of Hurst Spit is the deepest area of the Solent, reaching 60 metres in depth, which has an unusual tidal regime and encompasses a diverse range of habitats and communities. The subtidal marine life represents a transition between the warm temperate (Lusitanian) and cold temperate (Boreal) marine biogeographic provinces, resulting in a rich variety of organisms including representatives of both provinces. The seabed is composed of sandy sediment, which supports a variety of organisms including the slipper limpet (*Crepidula fornicata*) and red macroalgae, some of which are non-native species, burrowing polychaete worms and molluscs. The coastal marine environment acts as a spawning and nursery area for several species of commercially important fish including Dover sole, cod, and bass.

The narrow entrance to Christchurch Harbour reduces the level of flushing, creating an internationally rare habitat of brackish lagoon conditions, consisting of relatively low species abundance but with large populations of intertidal and subtidal marine invertebrates. Extensive areas of shallow intertidal mudflats support dense populations of burrowing organisms, which provide an important food source for the internationally important bird life in the Harbour. Rare brackish water species include the protected amphipod (*Gammarus insensibilis),* nationally scarce tentacled lagoon worm (Alkmaria *romijni),* nationally rare *Epistomia bursaria*, critically endangered *Anguilla,* nationally scarce *Trapania pallida*, *Phoca vitulina* and nationally scarce *Stenosoma lancifer.* The Harbour also acts as an important nursery ground for several commercial species of fish, including bass, Dover sole, thick-lipped mullet, thin lipped mullet, pollack and flounder. The estuaries that form the Harbour are important salmon and eel fisheries and recreational angling occurs throughout the year.

### 3.2.4 Geology

The coastline between Highcliffe and Milford-on-Sea is designated as Highcliffe to Milford SSSI for its earth heritage.

From Hurst Spit westwards, the geology comprises Headon Beds for most of the coastal strip up to the Becton Bunny outfall, where the geology changes to Barton Sand. It is part of a complex known as the Hampshire Basin, a wider geological area extending over the New Forest catchment. The Hampshire Basin comprises silts, sands

and clays laid down in alternating marine, estuarine and freshwater environments during the Bartonian Age (30 to 40 million of years ago).

Hengistbury Head has Boscombe sand at its base, moving up into Lower and Upper Hengistbury beds. Upper Hengistbury beds contain ironstone nodules. Above this are the Highcliffe beds, which extend east before the Barton Clay (from Highcliffe through to Naish and Barton-on-Sea) onto Headon beds.

### 3.2.5 Palaeontology

The cliffs between Highcliffe and Milford-on-Sea provide access to the standard succession of the fossil rich Barton and Headon Beds. The area from Friars Cliff to Milford-on-Sea is the type locality for the Barton Beds and the best exposure of the Lower Headon Beds.

Chewton Bunny is the only site to yield fossil plants from the Lower Barton Beds and is an internationally important site, whilst the Barton Cliffs are important for early Tertiary reptiles, particularly turtles. Paddy's Gap is a famous fossil plant locality with abundant fossil fruit remains.

Hordle Cliff is a key site for fossil birds, mammals, reptiles and plants. Seven genera of fossil plants found here are limited to this site in Britain and many species are unique in Tertiary deposits worldwide. Associations of plant fossil with faunal remains make this a valuable site for paleoenvironmental analysis. This is a critical site for European Tertiary palaeobotany and palaeoecology.

### 3.2.6 Geomorphology

Littoral drift in the study area is predominantly from west to east, corresponding with the direction of greatest fetch along the English Channel.

Hengistbury Head is a feature of major environmental interest, which has undergone significant erosion. Archaeological evidence suggests that the Head has reduced in size very significantly over the last 2,000 years since the Iron Age Double Dykes fortification was constructed (Middlesex Polytechnic, 1987). Erosion is believed to have accelerated in the 19th century as a result of mining ironstone from the soft cliffs, which formerly provided a natural defence. These cliffs are weak / unstable, and subject to land sliding due to erosion. This process provides a source of material into the system, however defences along sections of this coastline reduce the amount of material produced to protect the cliffs.

Over the last 200 years, the coastline of the Head has retreated approximately 100m northwards and Warren Hill has been reduced to half its former area. Examination of historic Ordnance Survey maps and aerial photographs indicate that the recent rate of retreat is 1 to 2 metres per year. However, the construction of Hengistbury long groyne has led to beach accretion and sand dune formation on the south west corner of the Head, which has stabilised this area and protected it from wave attack. The currently most vulnerable part of the Head to erosion is thought to be in the area of Double Dykes.

Hengistbury Head plays a key role in the overall morphology of Christchurch Bay, firstly by forming the southern side of Christchurch Harbour and protecting the town of Christchurch, and secondly by acting as a hard point which separates Christchurch Bay from Poole Bay to the west. In the absence of the Head, it is likely that the coast from Durlston Head to Hurst Spit would evolve into a single bay with its head inland of the present position of Christchurch.

Mudeford Spit extends from Hengistbury Head northwards across the mouth of Christchurch Harbour. It is believed to have undergone accretion as a result of ironstone mining from the Head in the 19th Century and by 1880 the spit extended a kilometre further east than its present position. However, since 1950 the spit has eroded as a result of lack of replenishment material from the south, increasing the exposure of the cliffs at Highcliffe to wave attack.

Hurst Spit, at the eastern boundary of the study area, lies across the western end of the Solent and protects Keyhaven Marshes, on its northern shore, from direct wave action. The spit is a mobile feature formed from deposited flint gravels, and it provides a key role in the morphology of Christchurch Bay (see AECOM coastal processes report for more details). Narrowing and recession of the spit over the past century or so has been attributed to a shortage of material from the cliffs within Christchurch Bay, which have been progressively protected by sea defence works, although the erosion of Plateau gravel is the main source of gravel sized material. The spit breached in 1989, as a result of the ongoing depletion in the natural supply of material from the west. Further to this, the storm in February 2014 lead to damage to the spit through over-washing. Recent engineering work has been undertaken to stabilise the spit, including recharge in 1996 using sediment dredged from the Shingles Bank a short distance offshore of the spit.

The baseline geomorphology of the Strategy area will be further described within the coastal processes baseline report.

## 3.3 Future Baseline

Designated sites and important habitats identified in Section 3.2 are likely to come under pressure, due to the increased risks of coastal flooding and erosion arising through the effects of climate change over the next 100 years. In particular, the beaches and historic cliffs which hold high geological and palaeontological importance are likely to retreat, in line with historic rates. Further to this, as older coastal defences fail, coastal erosion rates may increase in the future and there may be an element of erosion 'catch-up' where initial erosion rates may exceed historical averages in response to defences failing. This has the potential to impact designated sites located along the coastline, and further inland, leading to a loss of habitat and coastal squeeze.

The policies and plans in Table 3-1, including the NPPF, the Dorset Heathlands Planning Framework 2020 – 2025 and the Local Plans will continue to provide protection to all of the identified designated sites and important coastal habitats. Without the implementation of the Strategy, the existing coastal defences may be maintained in some areas to protect these sites.

The Strategy provides an opportunity to ensure that future coastal flooding and erosion has minimal effects on biodiversity, by implementing coastal defence measures to improve coastal habitats such as those identified in the National FCERM Strategy. This could lead to restoration, recovery and re-connection of habitats in intertidal areas of the coastline to enhance and protect the natural environment.

## 3.4 Key Issues

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 the key features within these sites for which they are designated should not be compromised, and efforts should be made to enhance these sites through habitat restoration and re-connection where possible. There are a wide variety of habitats in the Strategy area, particularly in Christchurch Harbour, including mudflats, saltmarsh and sand dunes which support diverse plant and animal communities.

Coastal defences and development must avoid disruption to coastal processes where it could lead to the loss of important coastal habitats (e.g. through defence footprint encroachment), including those identified which support rare and scarce species. Many of these sites have great ornithological importance, supporting large breeding and over-wintering populations of wildfowl and other birds and preservation of their habitats is important.

There are a number of management policies, plans and strategies which aim to protect and enhance the biodiversity and geodiversity of Christchurch Bay & Harbour. The implementation of the Strategy would offer further opportunities for the protection of designated sites and prevent their inundation and erosion, complimenting the coastal defence measures which are already in place.

## 3.5 Scoping Outcome

The **Biodiversity and Geodiversity theme has been scoped in to the SEA**, as there is potential for significant effects on coastal habitats and designated sites where new coastal defence measures may be implemented as part of the Strategy. It will be important to ensure that there are no significant adverse effects on the designated sites such as MCZ, SAC, SPA, SSSI and RAMSAR sites. There will also be opportunities to enhance biodiversity in the Strategy area, to achieve biodiversity net gain.

## 3.6 SEA Objective

Table 3-3 presents the SEA objective and appraisal questions that will be used to assess the Strategy in relation to this theme.

**Table 3-3: SEA Framework of objectives and assessment questions: Biodiversity and Geodiversity**

| SEA Objective | Supporting Questions (will the policy option help to…) |
|---|---|
| To protect and enhance biodiversity and geodiversity habitats and species; achieving biodiversity net gain and improved habitat connectivity within the Strategy area. | • Protect and enhance European, nationally and locally designated sites, including species that are important to the integrity of these sites and recognised as priority species?<br>• Protect, enhance and improve connectivity of habitats?<br>• Support the delivery of biodiversity net gain?<br>• Support habitat creation, restoration and recovery in the coastal environment?<br>• Increase the resilience of biodiversity in the Strategy area to the effects of climate change through increased coastal flooding and erosion? |

# 4. Climate Change

This section focuses on activities in the Strategy area that contribute to climate change and mitigation, including the effects of climate change on flooding and coastal erosion.

## 4.1 Policy Context

Table 4-1 presents the most relevant documents identified for policies to manage climate change.

**Table 4-1: Plans, policies and strategies reviewed in relation to climate change**

| Policy | Year of publication | Weblink |
|---|---|---|
| **Environment Bill 2020** | 2020 | https://www.gov.uk/government/publications/environment-bill-2020 |
| **National Flood and Coastal Risk Management Strategy for England** | 2020 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920944/023_15482_Environment_agency_digitalAW_Strategy.pdf |
| **National Planning Policy Framework (NPPF)** | 2021 | https://www.gov.uk/government/publications/national-planning-policy-framework--2 |
| **The Clean Air Strategy** | 2019 | https://www.gov.uk/government/publications/clean-air-strategy-2019 |
| **Clean Growth Strategy** | 2017 | https://www.gov.uk/government/publications/clean-growth-strategy |
| **A Green Future: Our 25 Year Plan to Improve the Environment** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf |
| **South Inshore and South Offshore Marine Plan** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726867/South_Marine_Plan_2018.pdf |
| **Decarbonising Transport: Setting the Challenge** | 2020 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/932122/decarbonising-transport-setting-the-challenge.pdf |
| **UK (second) National Adaptation Programme 2018 to 2023** | 2018 | https://www.gov.uk/government/publications/climate-change-second-national-adaptation-programme-2018-to-2023 |
| **Bournemouth Local Plan** | 2012 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Bournemouth/Docs/Core-Strategy-1.pdf |
| **Christchurch and East Dorset Local Plan** | 2014 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Christchurch/docs/christchurch-and-east-dorset-adopted-core-strategy.pdf |
| **New Forest District Council Local Plan 2016 - 2036** | 2020 | https://www.newforest.gov.uk/media/705/Local-Plan-Document-2016-2036/pdf/Local_Plan_2016-2036_Part_One_FINAL.pdf?m=637329191351130000 |
| **New Forest National Park Local Plan 2016 - 2036** | 2019 | https://www.newforestnpa.gov.uk/app/uploads/2019/09/Local-Plan-2016-2036-finalforweb.pdf |

| Policy | Year of publication | Weblink |
|---|---|---|
| **The Climate and Ecological Emergency Action Plan** | 2019 | https://democracy.bcpcouncil.gov.uk/documents/s14048/Response%20to%20Climate%20and%20Ecological%20Emergency.pdf |

The Strategy will be developed in accordance with the National FCERM Strategy and FCERM-AG, considering the risks of climate change in the decision-making process by assessing future impacts of sea level rise on flood and erosion risks and incorporating these risks into the strategy economics and optional development / appraisal. This will include assessing the impact of the most up-to-date climate change projections on flooding and coastal erosion. The Strategy will support the aims of the National FCERM Strategy: creating climate resilient places, making today's growth and infrastructure resilient in tomorrow's climate and creating a nation ready to respond and adapt to flooding and coastal change.

Any flood and coastal erosion management schemes that come forward and require planning permission will adhere to the NPPF, by developing a sustainable plan to manage the increased risks of flooding and coastal erosion over the next 100 years. The coastal management measures to be implemented with the Strategy will be primarily designed as a method of adaptation to climate change, although the carbon emissions associated with these measures will be minimised where possible to support the national strategies and Local Plan policies.

The Clean Growth Strategy, Clean Air Strategy and the 25 Year Environment Plan will all be adhered to, supporting the government's commitment for net zero carbon emissions by 2050 under the UK Climate Change Act. Where possible, coastal management measures will seek to use resources efficiently with minimal carbon emissions, improve water quality, reinstate natural habitats, and enhance biodiversity. This will also meet the aims of the emerging Environment Bill for climate change mitigation. Additionally, BCP Council's Climate and Ecological Emergency Action Plan sets out more localised targets for mitigation and adaptation against the impacts of climate change, to reach the goal of zero net carbon by 2050.

The South Inshore and South Offshore Marine Plan (HM Government, 2018) includes similar policies to ensure that new development proposals are resilient to the impacts of climate change for their lifetime, and they should demonstrate they can avoid, minimise and mitigate the impact of climate change.

# 4.2 Current Baseline

## 4.2.1 Carbon Emissions

CO2 emissions in kilo tonnes (kt) are shown by sector for BCP Council area and NFDC area[7] in Figure 4-1 and Figure 4-2. Figure 4-3 shows the total CO2 emissions in tonnes (t) per capita per year for these two areas and across England.

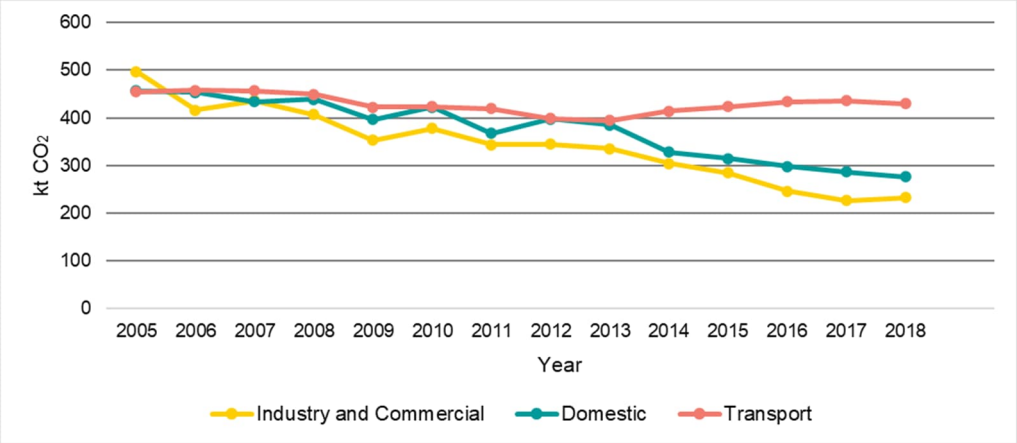


**Figure 4-1: CO2 Emissions by Sector in Bournemouth, Christchurch and Poole**

[7] Department for Business, Energy and Industrial Strategy (2020) UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2018. Available from: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2018 [Accessed 21 October 2021]

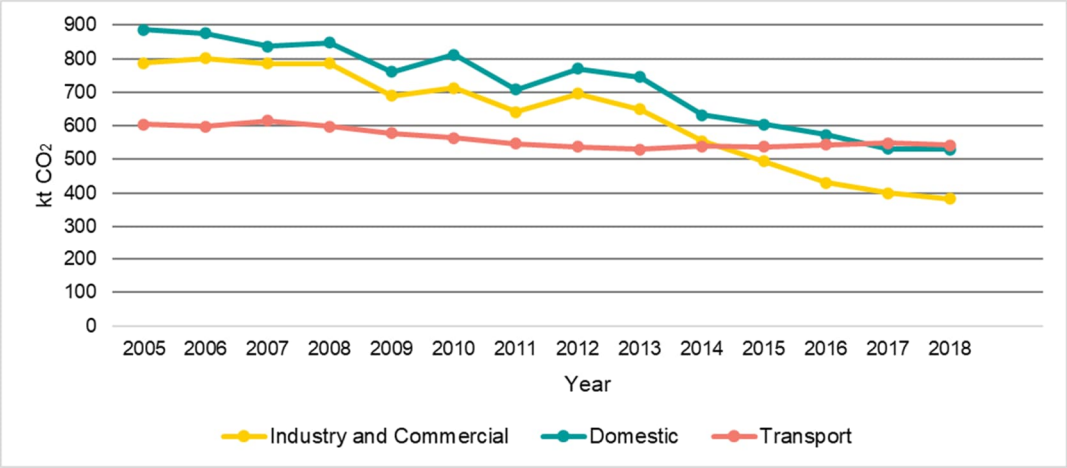


**Figure 4-2: CO2 Emissions by Sector in the New Forest District**

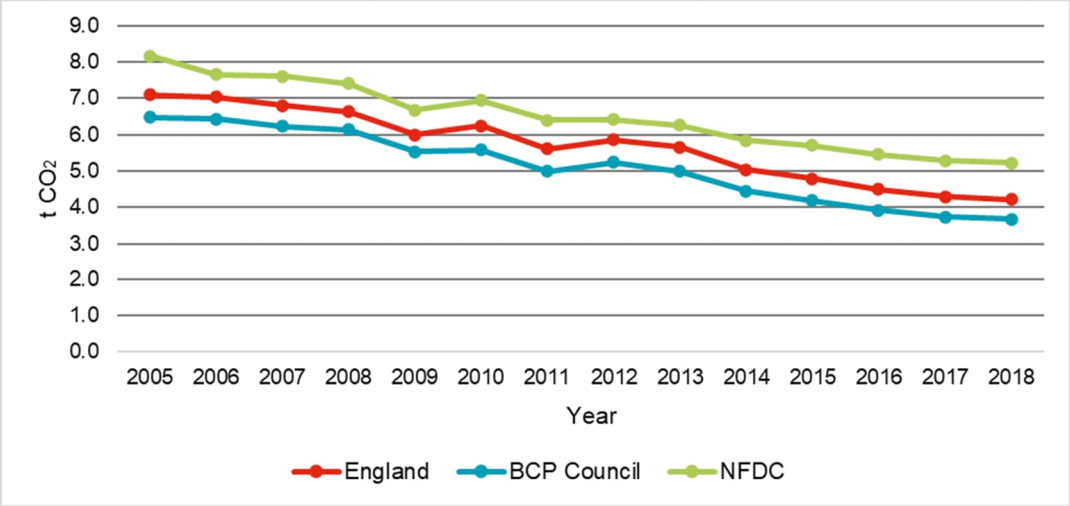


**Figure 4-3: CO2 Emissions per Capita for England, BCP Council and NFDC**

In the BCP Council area, the total $CO_2$ emissions in 2018 were estimated at 1407kt, a 49.8% reduction from 2005 levels. Similarly, the total $CO_2$ emissions for the NFDC area reduced 56.6% between 2005 and 2018, to 2276kt. This follows the national trend, as the energy mix has become less dependent on coal with a preference for renewable energy. Per capita emissions are slightly lower than the average for England in the BCP Council area, although NFDC emissions per capita are slightly higher.

In the NFDC area, the largest source of emissions is from domestic use, and the reduction has primarily been due to the reduction in emissions generated by electricity and increased efficiency of appliances. However in the BCP Council area, transport continues to be the biggest contributing sector with emissions from minor road being the highest, followed by emissions from A-roads.

## 4.2.2 Climate Change Projections

The Intergovernmental Panel on Climate Change (IPCC) produces a report every six to seven years to assess the scientific, technical and socio-economic information concerning climate change. The most recent report, the Sixth Assessment Report (AR6)[8] (2021) provides an understanding of the current state of climate change and knowledge of possible futures.

Various climate change models have been developed based on the previous IPCC reports to evaluate the future effects of climate change using simulations, including UK Climate Projections UKCP18. Projections are provided at a regional level, shown in probabilistic form to illustrate the full range of potential changes and the level of confidence in each prediction.

[8] IPCC (2021) Sixth Assessment Report [online]. Available from: https://www.ipcc.ch/report/ar6/wg1/#SPM [25 October 2021]

UKCP18 (2021) has been developed by the Met Office Hadley Centre, in partnership with DEFRA, the Department for Business, Energy and Industrial Strategy (BEIS), the Devolved Administrations and the Environment Agency based on the IPCC Fifth Assessment Report. Based on the UKCP18 climate change projections, the Environment Agency has produced guidance[9] for which site emissions scenario and specific sea level rise values should be used in coastal strategies and schemes. This guidance will be utilised for further modelling as part of this Strategy, to show the risk of tidal flooding over the next 100 years.

A medium emissions scenario (RCP4.5) in the Strategy area would lead to an increase in summer mean temperature of 3°C, and an increase in mean winter precipitation of 34%[10]. This would lead to rising sea levels, an increased risk of flooding and coastal erosion, and a requirement for new coastal defences. Other impacts include:

- Reduction in availability of water, such as groundwater for extraction and a need to increase capacity of wastewater treatment plants and sewers;
- Reduced water quality from low stream levels and turbulent stream flow after heavy rain;
- Soil erosion due to flash flooding; and,
- Loss of habitat and species in the marine and coastal environment.

The Climate and Ecological Emergency Draft Action Plan for BCP Council identifies actions to be taken to prevent these impacts, including investigating natural flood defence and coastal protection opportunities for intertidal habitat creation which would reduce flood risk and act as a carbon store.

### 4.2.3 Flood Risk

Tidal and fluvial flood risk for the present day in the Strategy area is shown below in Figure 4-4, from the Environment Agency's flood risk modelling in the following three flood zones:

- Flood Zone 1: Less than 0.1% probability of flooding in any year;
- Flood Zone 2: Between 0.1% and 1% probability of flooding from rivers, or between 0.1% and 0.5% probability of flooding from the sea; and,
- Flood Zone 3: 1% or greater probability of flooding from rivers, or 0.5% or greater probability of flooding from the sea.

Surface water flood risk is shown in Figure 4-5 and Figure 4-6, where the extent of flooding is denoted by the shade of blue:

- High risk (dark blue) – each year the area has a 3.3% probability of flooding from surface water;
- Medium risk – each year the area has between a 1% and 3.33% of flooding from surface water; and,
- Low risk – each year the area has between a 0.1% and 1% probability of flooding from surface water.

[9] Environment Agency (2020) Flood and coastal risk projects, schemes and strategies: climate change allowances [online] Available from: https://www.gov.uk//guidance/flood-and-coastal-risk-projects-schemes-and-strategies-climate-change-allowances#general-approach [Accessed 12 July 2021]

[10] Met Office (2020) UKCP18 key results for the probabilistic projections for aggregated regions and sea level rise information [online] Available from: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/key-results [Accessed 21 June 2021]

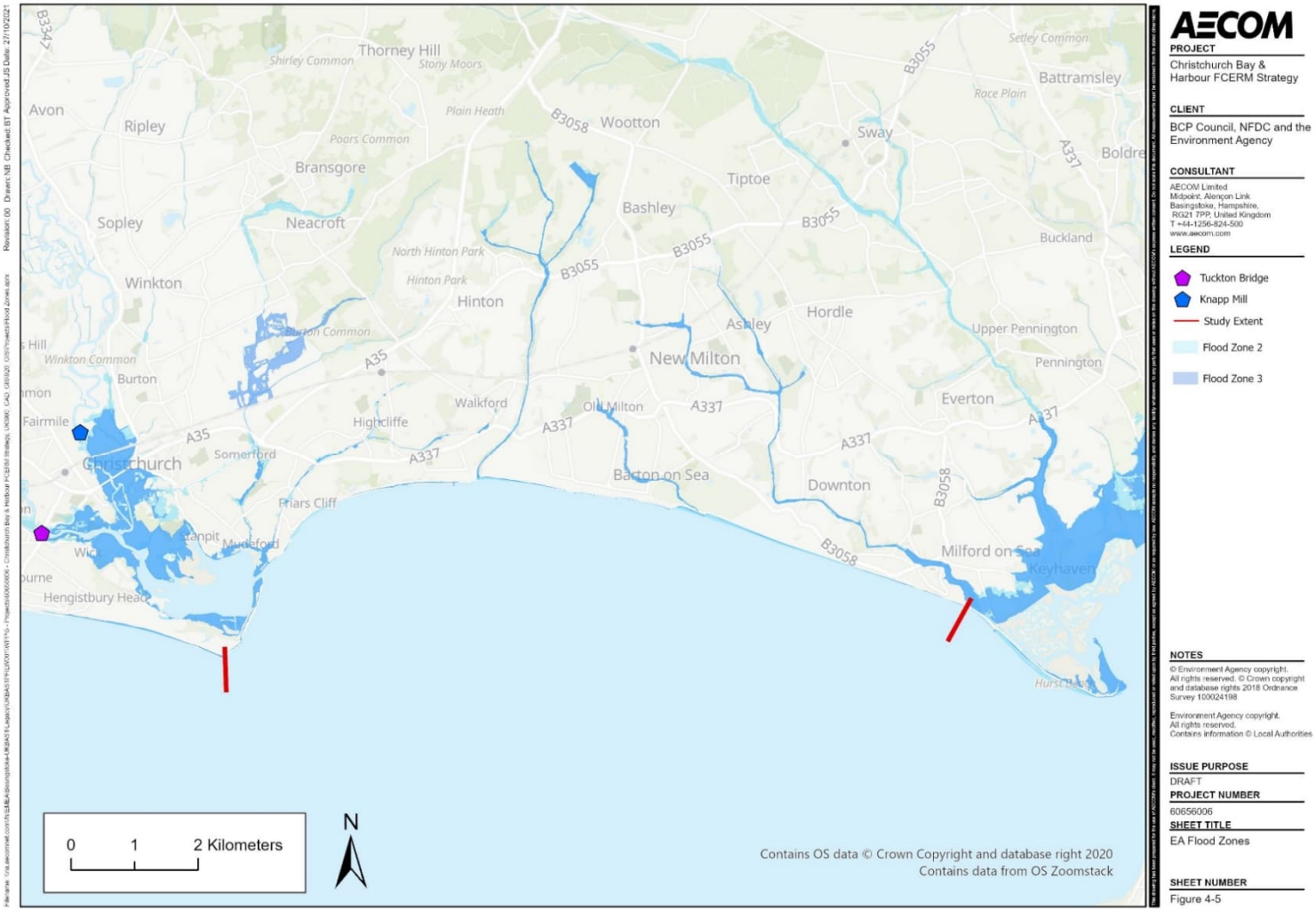


**Figure 4-4: Tidal and Fluvial Flood Risk in the Strategy area**

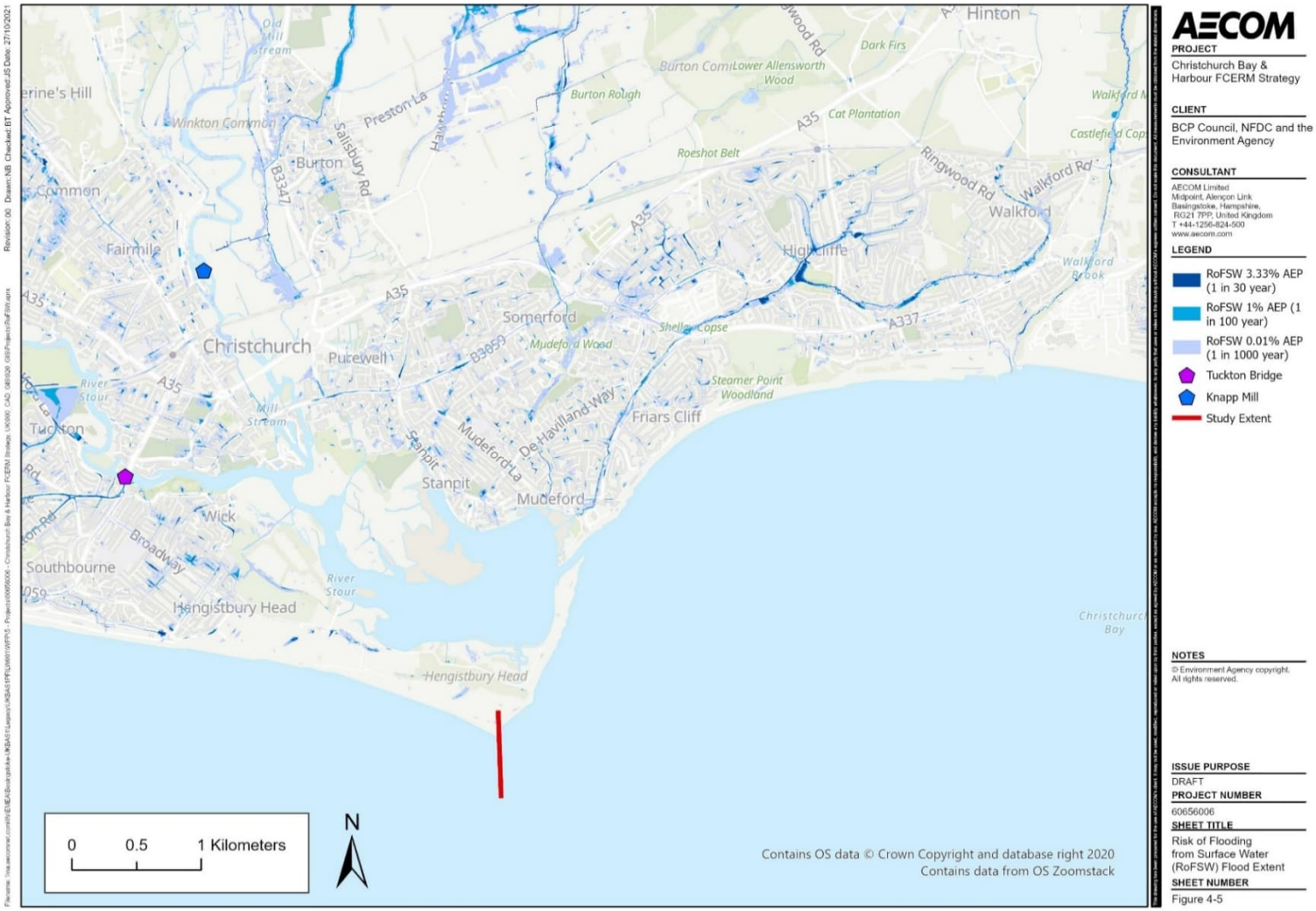


**Figure 4-5: Surface Water Flood Risk from Hengistbury Head to Barton-on-Sea**

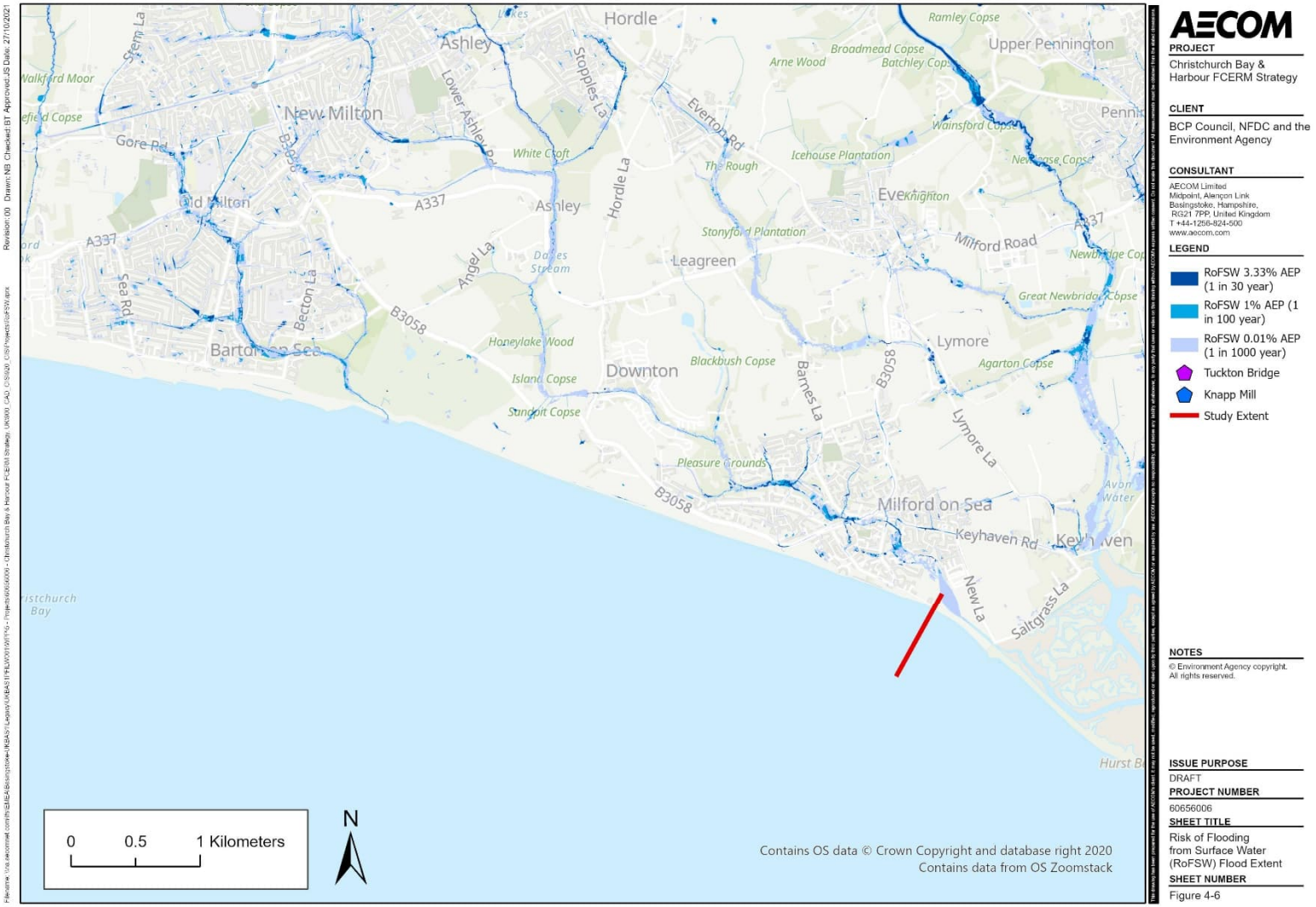


**Figure 4-6: Surface Water Flood Risk from Barton-on-Sea to Milford-on-Sea**

### 4.2.4 Erosion Risk

Sea level rise caused by climate change can lead to an increase in coastal erosion, as waves begin to extend further up and along beaches and cliffs. The National Coastal Erosion Risk Mapping (NCERM, 2020) has been produced by the Environment Agency (original version 2018, updated in 2020) to show coastal erosion zones around the country's coastline for the next 100 years.

The dataset provides erosion zones for the Strategy area in a 'No Active Intervention' Scenario. This is the baseline scenario to be used in the Strategy, which is a hypothetical walkway where there is no provision or maintenance of any defences, leading to the coastline evolving naturally. This is divided into three time periods over the next 100 years: Short Term (0 – 20 years), Medium Term (20 – 50 years) and Long Term (50 – 100 years). This is presented in Figure 4-7.

Recession of the soft rock cliff along Christchurch Bay is controlled by a range of factors, but it is the continued exposure of the cliff toe to marine erosion that is often the key driver behind the recession process. The degree to which a cliff toe is exposed to erosion is determined by factors such as the erodibility of the cliff toe material, the local hydrodynamic conditions and longshore distribution of wave energy, and the level of protection offered to the cliff toe by beach material or coastal defences. Large parts of the frontage have had coastal engineering works undertaken to improve the stability of the cliffs, which play an important role in the cliff erosion and determine which erosion processes have the most influence along different parts of the frontage. For example, at Hordle cliffs, which are currently undefended, the rate of erosion is greatly influenced by beach levels and exposure of the cliff toe whereas at Barton on Sea, where extensive coastal protection works are in place, the cliff recession is more closely related to groundwater processes and rainfall.

The cliffs in Christchurch Bay erode in a cyclical pattern, with sections of cliff failing before a period of stabilisation. For the exposed sections of cliff, for example at Hordle, the timing of cliff failures typically coincides with stormy periods. After periods of stability that may last 3-4 years, "coastal catch-up" is often experienced resulting in significant losses within a relatively short timescale. For example, in 2004 approximately 8-9m of cliff was lost during one storm. At Barton on Sea, typically movement in the cliffs is observed if rainfall exceeds 80mm per month for three successive months (as per communications with local engineers). Drainage improvements at this location, designed to reduce the risk of slope failures, have previously had a limited effect lasting a few years before coastal catch-up is re-established.

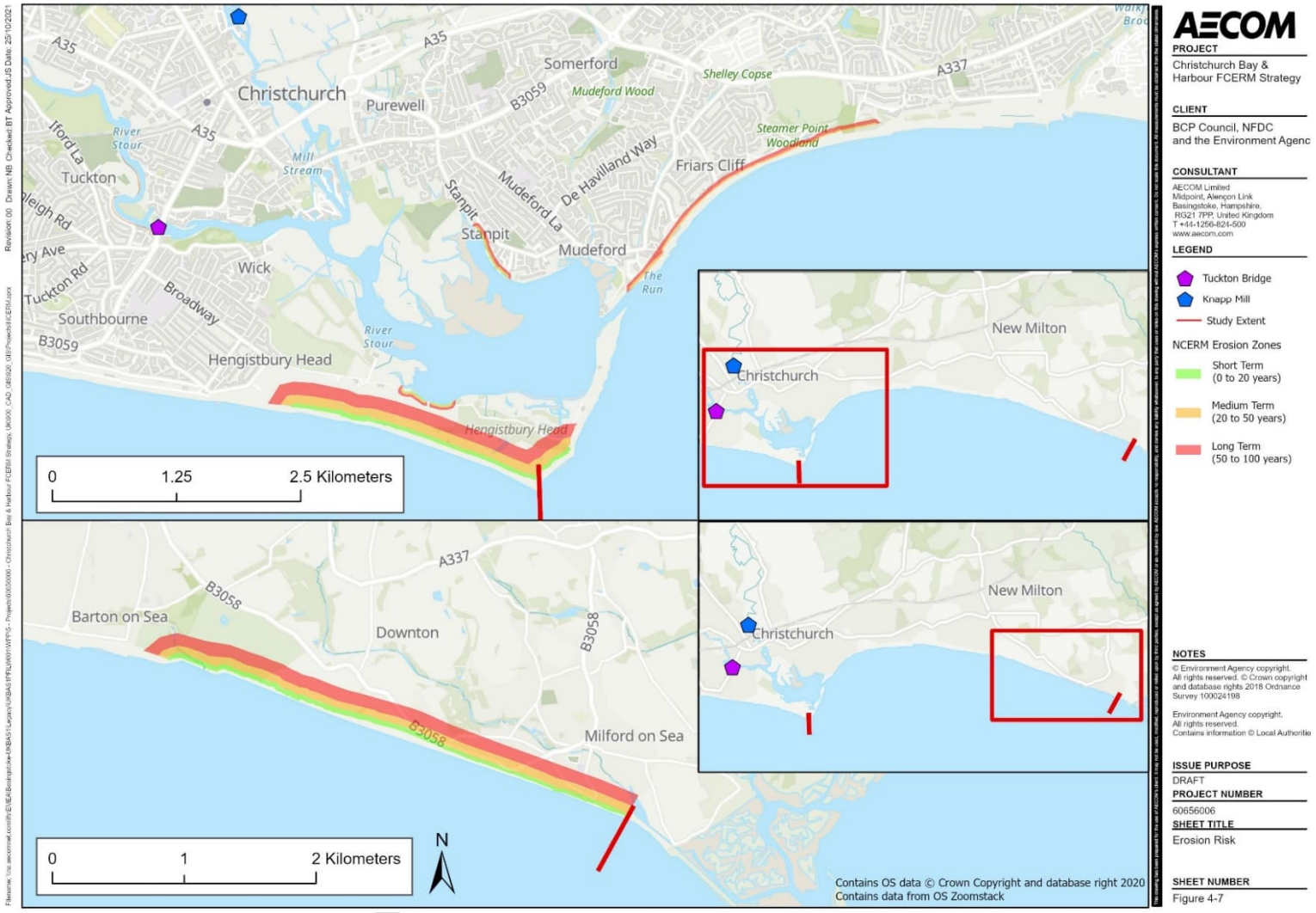


**Figure 4-7: No Active Intervention Zones from the NCERM Dataset**

## 4.3 Future Baseline

It is likely that $CO_2$ emissions from the Strategy area will decrease in the future, following the trend from 2005 to 2018, with the adoption of energy efficiency measures as indicated in BCP Council's Climate and Ecological Emergency Draft Action Plan and the 25 Year Environment Plan to reach the goal of zero net carbon by 2050.

The climate change projections presented in Section 4.2.2 detail that a medium emissions scenario will lead to rising sea levels with more frequent and extreme storm events, leading to increased wave heights. Such weather events will increase the risks associated with flooding and coastal erosion, with an increased need for resilience and adaptation. Similarly, more extreme storm events may lead to increased coastal erosion, exposing the soft rock cliffs and causing further instability and cliff recession.

Flood risk at any specific location in the Strategy area may be influenced by local factors such as existing formal or informal coastal defences and the capacity of existing drainage systems. The implementation of upgraded or new coastal defence measures and sustainable urban drainage systems (SuDS) could reduce the onset of flooding and have positive effects in terms of mitigating flood risk. These solutions could also reduce coastal erosion, supporting the stabilisation of the cliffs. Furthermore, nature based solutions identified within the Strategy will provide protection as well as reducing $CO_2$ emissions compared to traditional coastal defences, and creating new habitats which could act as carbon stores.

## 4.4 Key Issues

The IPCC report highlights the urgency to act on climate change now in order to limit the impacts of rising global temperatures as much as possible. If levels of $CO_2$, and other greenhouse gas emissions, continue to rise then the increase in temperatures could become irreversible.

$CO_2$ emissions per capita are slightly higher than the average for England in the NFDC area, and slightly lower in the BCP Council area; both have followed the national trend of reducing $CO_2$ emissions since 2005.

The Strategy area predominantly falls within Flood Zone 1, although there are stretches of Flood Zone 2 and 3 at the coast, and running along the Rivers Avon and Stour. Climate change is predicted to lead to an increase in sea levels, temperatures and precipitation, as well as more frequent storm surges and high tides causing more extreme weather events and leading to more widespread fluvial and tidal flooding. Increased precipitation could also lead to increased surface water flooding throughout the Strategy area. Implementing new coastal defences, nature based solutions and SuDS could mitigate some of the impacts of climate change. This could also lead to increased rates of coastal erosion, impacting beach levels and the stability of the soft cliffs

## 4.5 Scoping Outcome

The **Climate Change theme has been scoped in to the SEA**, as the Strategy is likely to have positive significant effects on coastal flood and erosion risks over the next 100 years, which are predicted to increase due to climate change. The Strategy will explore opportunities to provide climate resilience and mitigate coastal flood and erosion risks, through new coastal defence and policy measures. The Strategy will also look to promote low or zero carbon approaches to coastal management, in line with the National FCERM Strategy and aim to minimise the carbon impact of FCERM in the area.

## 4.6 SEA Objective

Table 4-2 presents the SEA objective and appraisal questions that will be used to assess the Strategy in relation to this theme.

**Table 4-2: SEA Framework of objectives and assessment questions: Climate Change**

| SEA Objective | Supporting Questions (will the policy option help to…) |
|---|---|
| To support the resilience of the Strategy area to the potential effects of climate change, including coastal flooding and erosion. | • Contribute to adapting to climate change?<br>• Contribute to mitigating the main causes of climate change by promoting low or zero carbon approaches? |

# 5. Landscape

This section focuses landscape and seascape character and quality, as well as the visual amenity of Christchurch Bay & Harbour.

## 5.1 Policy Context

Table 5-1 presents the most relevant documents identified for managing the landscape.

**Table 5-1: Plans, policies and strategies reviewed in relation to landscape**

| Policy | Year of publication | Weblink |
|---|---|---|
| **National Flood and Coastal Risk Management Strategy for England** | 2020 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920944/023_15482_Environment_agency_digitalAW_Strategy.pdf |
| **European Landscape Convention** | 2000 | https://www.coe.int/en/web/landscape/the-european-landscape-convention |
| **National Planning Policy Framework (NPPF)** | 201 | https://www.gov.uk/government/publications/national-planning-policy-framework--2 |
| **A Green Future: Our 25 Year Plan to Improve the Environment** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf |
| **South Inshore and South Offshore Marine Plan** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726867/South_Marine_Plan_2018.pdf |
| **Bournemouth Local Plan** | 2012 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Bournemouth/Docs/Core-Strategy-1.pdf |
| **Christchurch and East Dorset Local Plan** | 2014 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Christchurch/docs/christchurch-and-east-dorset-adopted-core-strategy.pdf |
| **New Forest District Council Local Plan 2016 - 2036** | 2020 | https://www.newforest.gov.uk/media/705/Local-Plan-Document-2016-2036/pdf/Local_Plan_2016-2036_Part_One_FINAL.pdf?m=637329191351130000 |
| **New Forest National Park Local Plan 2016 - 2036** | 2019 | https://www.newforestnpa.gov.uk/app/uploads/2019/09/Local-Plan-2016-2036-finalforweb.pdf |

The Strategy will be developed in accordance with the National FCERM Strategy, which details the importance of developing innovative approaches to conservation which enable adaptation to flooding and coastal erosion, in order to sustain natural landscapes for the future.

All landscapes are afforded protection for their intrinsic contribution to the character of an area. This is supported by the European and Landscape Convention (2000) which promotes actions at the landscape scale from protection and conservation to management, improvement and even the creation of landscapes. Any flood and coastal erosion management schemes that are recommended by the Strategy and require planning permission will comply with the policies in the NPPF, which relate to conserving and enhancing protected landscapes and scenic beauty. This will also be in accordance with the 25 Year Environmental Plan which seeks to enhance natural habitats and landscapes to protect the local character, and provide green spaces.

The Strategy will align with the policies within the South Inshore and South Offshore Marine Plan (HM Government, 2021), to consider the seascape and marine character of the area as part of all new developments. Similarly, it will adhere to Local Plan policies which relate to valuing landscapes, landscape character, green infrastructure and design, according to the landscape character assessments for Christchurch, Dorset and Hampshire.

# 5.2 Current Baseline

## 5.2.1 Designated Sites

The landscape within the Strategy area is not nationally designated. However, the New Forest National Park is an area of outstanding landscape importance located outside of the Strategy area to the northeast. This includes Hurst Spit, which is located just eastwards of the Strategy area.

## 5.2.2 Landscape and Seascape Character

The coastline at Christchurch Bay, and most of Christchurch Harbour, is located within the New Forest National Character Area (NCA)[11], with the western end of Christchurch Harbour at Hengistbury Head located within the Dorset Heaths NCA[12].

### 5.2.2.1 Christchurch Bay

The Bay from Mudeford Quay to Highcliffe is composed of a narrow beach, consisting of sand and shingle with coastal defences interspersed (timber and rock groynes and concrete sea walls) to protect against erosion. On the flat land behind the beach, there are residential properties. Although the cliff tops are fringed by trees, they allow views out to sea. This tree line is an important element in the views back into the coast from the sea and along the coast. There are larger settlements at Milford-on-Sea, Barton-on-Sea and Highcliffe, setback from the cliff edge.

The landscape here is composed of low-lying slumped cliffs, behind a popular sand and shingle beach, with beach huts at various locations along the base of the cliffs. On the eastern side of Highcliffe and Walkford Brook, there is a deep valley cut which creates a narrow cliff frontage, referred to as ‘Chewton Bunny’.

Mudeford Quay is an open breakwater at the harbour entrance, which provides a hard quayside setting and green space inside. It is a popular access point for people to reach the sea and look back into the harbour areas. The Quay is based on a natural shingle spit that forms the edge of a double spit formation at the harbour entrance, with the outer area referred to as Mudeford Sandbank.

Steamer Point is located on the western side of Highcliffe, which features Steamer Point Nature Reserve, Highcliffe Castle and the golf course. Highcliffe Castle is a public site, and retains a strong landscape setting as well as being one of the few remaining vestiges of the former pattern of country houses in the Highcliffe area. These areas provide significant green space including woodlands and a coastal footpath between Mudeford and Highcliffe, acting as a unique and accessible environment.

Between Friars Cliff and the western end of Highcliffe, the cliff faces are nearly vertical. The cliff faces below the evergreen oak woodland are sparsely vegetated. There are some hard paved paths along sections of the back of the beach, although these are not continuous and do not cover the full length of the bay.

The urban areas of Barton-on-Sea and Milford-on-Sea provide large residential settlements, with recreational developments along the beaches and cliff tops including Hordle Cliff Beach. They provide stunning views across to Christchurch Harbour and the Isle of Wight, key fishing spots in Milford-on-Sea Beach and Hurst Spit and popular coastal walks. There are a range of coastal defences located along Christchurch Bay, including rock revetments, rock strongpoints and cliff drainage at Barton-on-Sea; timber groynes and concrete seawalls at Milford-on-Sea.

At Hurst Spit, there is a narrow shingle embankment which extends approximately 2.5km and features a castle and lighthouse at the tip. There is water on both sides of the spit, with open sea to the south and saltmarsh creeks to the north. This is an area with a special sense of remoteness, being accessible only by foot or boat, and is of great natural beauty.

[11] Natural England (2014) NCA Profile 131: New Forest (NE477) [online] available at: http://publications.naturalengland.org.uk/publication/5545755456569344?category=587130 [Accessed 15 June 2021]
[12] Natural England (2014) NCA Profile 135: Dorset Heaths (NE506) [online available at: http://publications.naturalengland.org.uk/publication/6271645295575040?category=587130 [Accessed 15 June 2021]

#### 5.2.2.2 Christchurch Harbour

Christchurch Harbour is a natural harbour sheltered to the south by the higher ground of Hengistbury Head, although part of the harbour has been reclaimed. The estuary, surrounding marshes, heath and woodland present a natural landscape creating a distinct attractive character.

The main rivers the Stour and Avon drain into Christchurch Harbour and their alluvial deposits have created a flat floodplain to the west. There are also a series of small streams and creeks which enter the Christchurch side of the basin from Stanpit and Mudeford (Purewell Stream, the River Mude and Bure Brook). The Stanpit and Grimbury Marshes are extensive areas of grazed saltmarsh within the harbour – at low tide, these areas are expanded by the mud flats between the deeper channels.

The area is a popular sailing and mooring location, with numerous boat yards and river moorings particularly in the Harbour. The town of Christchurch lies adjacent to the Harbour on the west and north side, combining historic settlement, strong landscape and dynamic maritime settings.

Christchurch Harbour provides a strong sense of place, acting as an important setting to significant parts of the Strategy area. It is particularly valuable as a small scale natural estuary with areas for nature conservation and recreation.

## 5.3 Future Baseline

There are no designated landscape sites within the Strategy area, however national policies and strategies identified in Table 5-1 are likely to ensure protection and enhancement of the landscape and seascape for the future. The Local Plans for the Strategy area also include policies which will protect the landscape character by limiting new developments in some coastal zones, as well as introducing opportunities to enhance the landscape through the delivery of green infrastructure and recreational development.

Future coastal flooding and erosion may lead to changes to the coastal landscape, including landslides and slope failures on the cliffs along Christchurch Bay. This will also be influenced by the coastal defences measures that are maintained as part of the existing SMP. The implementation of the Strategy is likely to reduce the risks associated with coastal flooding and erosion, providing protection to the landscape. Conversely, new defence structures may reduce the quality of the landscape by impacting the visual amenity.

## 5.4 Key Issues

Whilst there are no designated landscape sites within the Strategy area, the area is recognised for its special landscape setting. Several locations along the Bay provide nature conservation and recreation, with Christchurch Harbour providing a strong sense of place, combining historic elements with the maritime setting.

Future development could reduce the landscape quality, however the policies and strategies in place aim to protect and enhance the landscape character and the quality of the coastal environment.

Increased climate change is likely to lead to further coastal flooding and erosion, which will particularly impact the cliffs located along Christchurch Bay, and the recreational development along the coastline.

## 5.5 Scoping Outcome

The **Landscape theme has been scoped in to the SEA**, as there is potential for significant effects upon the character of the landscape through the implementation of new coastal defence measures.

## 5.6 SEA Objective

Table 5-2 presents the SEA objective and appraisal questions that will be used to assess the Strategy in relation to this theme.

**Table 5-2: SEA Framework of objectives and assessment questions: Landscape**

| SEA Objective | Supporting Questions (will the policy option help to…) |
|---|---|
| To protect and enhance the character and quality of the Strategy area landscape and seascape. | • Conserve and enhance the quality of landscape / seascape for people, places and nature?<br>• Contribute to better management of landscape / seascape assets?<br>• Conserve and enhance features of local importance?<br>• Improve linkages to the coastline?<br>• Protect visual amenity? |

# 6. Historic Environment

This section focuses on designated and non-designated heritage assets, the setting of cultural heritage assets and archaeology within the Strategy area.

## 6.1 Policy Context

Table 6-1 presents the most relevant documents identified for managing the historic environment in the Strategy area.

**Table 6-1: Plans, policies and strategies reviewed in relation to the historic environment**

| Policy | Year of publication | Weblink |
|---|---|---|
| **European Landscape Convention** | 2000 | https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=176 |
| **Convention for the Protection of the Architectural Heritage of Europe** | 1985 | https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=121 |
| **European Convention on the Protection of Archaeological Heritage** | 1992 | https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=143 |
| **Planning (Listed Buildings & Conservation Areas) Act 1990** | 1990 | https://www.legislation.gov.uk/ukpga/1990/9/contents |
| **Ancient Monuments and Archaeological Areas Act 1979** | 1979 | https://www.legislation.gov.uk/ukpga/1979/46/contents?lang=en |
| **National Planning Policy Framework (NPPF)** | 2021 | https://www.gov.uk/government/publications/national-planning-policy-framework--2 |
| **A Green Future: Our 25 Year Plan to Improve the Environment** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf |
| **South Inshore and South Offshore Marine Plan** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726867/South_Marine_Plan_2018.pdf |
| **Heritage at Risk Programme** | 2021 | https://historicengland.org.uk/advice/heritage-at-risk/types/ |
| **Historic England Advice Note 1: Conservation Area Appraisal, Designation and Management** | 2019 | https://historicengland.org.uk/images-books/publications/conservation-area-appraisal-designation-management-advice-note-1/ |
| **Historic England Advice Note 3: The Setting of Heritage Assets** | 2017 | https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/ |

| Policy | Year of publication | Weblink |
|---|---|---|
| **Recording Dorset's Past Historic Environment Record Draft Forward Plan 2021 - 2025** | 2020 | https://www.dorsetcouncil.gov.uk/libraries-history-culture/local-history-heritage/her/forward-plan/forward-plan-2021-25.aspx |
| **Bournemouth Local Plan** | 2012 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Bournemouth/Docs/Core-Strategy-1.pdf |
| **Christchurch and East Dorset Local Plan** | 2014 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Christchurch/docs/christchurch-and-east-dorset-adopted-core-strategy.pdf |
| **New Forest District Council Local Plan 2016 - 2036** | 2020 | https://www.newforest.gov.uk/media/705/Local-Plan-Document-2016-2036/pdf/Local_Plan_2016-2036_Part_One_FINAL.pdf?m=637329191351130000 |
| **New Forest National Park Local Plan 2016 - 2036** | 2019 | https://www.newforestnpa.gov.uk/app/uploads/2019/09/Local-Plan-2016-2036-finalforweb.pdf |
| **Christchurch Central Conservation Area Appraisal and Management Plan** | 2005 | christchurch-central-town-centre-conservation-area-appraisal-management-plan-adopted-sept-2005 (bcpcouncil.gov.uk) |
| **Hurst Spit to Lymington Coastal Flood and Erosion Risk Management Strategy** | ongoing | https://consult.environment-agency.gov.uk/solent-and-south-downs/hurst-spit-to-lymington-project/ |
| **Lower Stour Flood Risk Management Strategy** | Ongoing | Liaison between the project teams but project at relatively early stage of development at present. |
| **Lower Avon Flood Risk Management Strategy** | ongoing | Liaison between the project teams but project at relatively early stage of development at present. |

In accordance with the NPPF, any flood and coastal erosion management schemes that come forward and require planning permission will be required to conserve and enhance the historic environment and assets in a manner appropriate to their significance. Options for coastal management should recognise the value of the local character and history, without preventing options for adaptation and innovative change. This should include consideration of cultural heritage as part of the landscape, as discussed in the European Landscape Convention. This is recognised in the 25 Year Environment Plan, which identifies the role of the historic environment in providing settlement identity, landscape and cultural value. There are also policies within the South Inshore and South Offshore Marine Plan (HM Government, 2018) to avoid, minimise and mitigate the impacts of any development on the historic environment and to maximise opportunities for enhancement.

The Strategy should allow for measures to be taken to protect architectural heritage, in line with the Convention for the Protection of the Architectural Heritage of Europe, the European Convention on the Protection of the Archaeological Heritage and the Ancient Monuments and Archaeological Areas Act 1979. The Strategy should also promote controls for Listed Buildings and Conservation areas, in accordance with the Planning (Listed Buildings and Conservation Areas) Act 2000.

Historic England's Advice Notes provide further guidance for conservation and enhancement of the historic environment, including understanding how settings and views contribute to the significance of heritage assets. By identifying the value of the historic environment, coastal management measures can consider any potential impacts on assets or character. The Strategy should also consider the Heritage at Risk (HAR) programme to understand the current state of the historic sites within the Strategy area, to help safeguard those most at risk for the future. The Historic Environment Record draft 2021 – 2025 sets out the operating framework for Dorset's Historic Environment Record (HER). Once fully developed, it will provide comprehensive information on the historic

environment as an evidence base for management strategies such as this FCERM Strategy. The Strategy will also conform to all Local Plan policies in reference to the historic environment.

## 6.2 Current Baseline

### 6.2.1 Designated Heritage Assets

There are four national designations for heritage assets within the Strategy area which recognise their importance and support their protection:

- Listed Buildings – special architectural or historic interest considered to be of importance, given a grade to express the level of interest (Grade I, Grade II* or Grade II). Grade I Listed Buildings are of exceptional interest. Grade II* buildings are particularly important buildings of more than special interest, whilst Grade II buildings are of special interest;
- Scheduled Monuments – nationally important archaeological sites or historic buildings;
- Protected Wrecks – restricted areas around shipwrecks which are likely to contain the remains of a vessel, or its contents, which are of historical, artistic or archaeological importance; and,
- Conservation Areas – areas of special architectural or historic interest designated by Local Authorities, the appearance of which it is desirable to preserve or enhance.

The Listed Buildings and Scheduled Monuments are shown in Figure 6-1. Locally, some sites are also recognised for archaeological value. These are listed on the Dorset and Hampshire Historic Environment Record (HER).

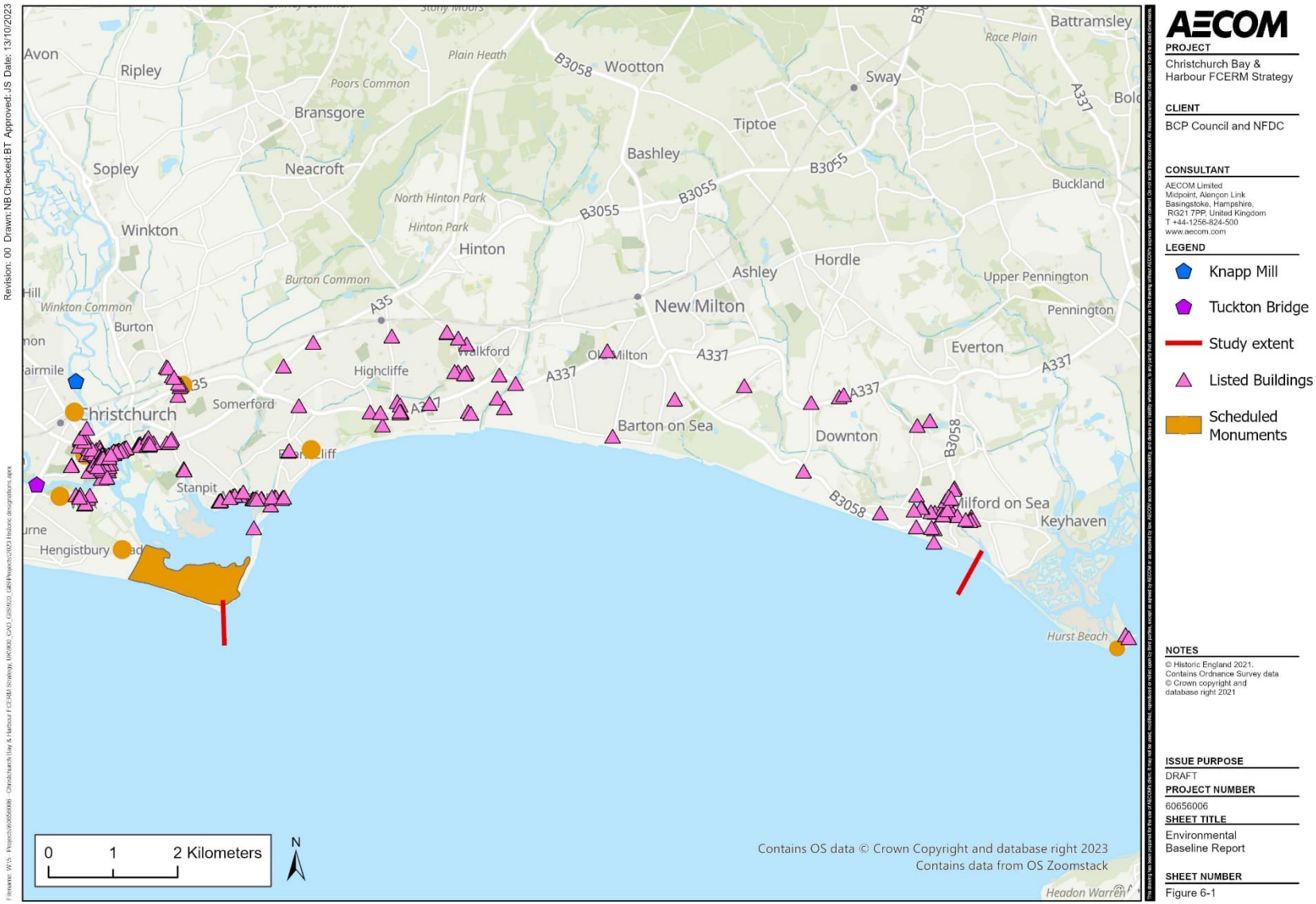


**Figure 6-1: Designated Listed Buildings and Scheduled Monuments in the Strategy area**

#### 6.2.1.1 Listed Buildings

Highcliffe Castle is a Grade I Listed Building and one of the most important Listed Buildings in the Area. The Castle has undergone a £5.2 million programme of repair works recently, and it is now owned by BCP Council. The older 'hamlets' of Purewell, Stanpit and Mudeford also have numerous statutory Listed and Locally Listed Buildings situated along historic streets. It is noticeable that there are five Grade I Listed Buildings in the town centre of Christchurch. Those that fall within the study area boundary include Christchurch Priory, Constable's House, Town Bridge and the Castle.

A number of other listed buildings of importance are also located within the Strategy area, as shown in Figure 6-1.

Beyond the east of the Strategy area, there are Grade II Listed Buildings including Hurst Lighthouse and the Lighthouse Keeper's Cottage, located on Hurst Spit.

#### 6.2.1.2 Scheduled Monuments

All the Scheduled Monuments in the Strategy area are included in Figure 6-1 and Table 6-2.

Hengistbury Head was formed in the Iron Age fortification of Double Dykes. It is the only non-cave occupation site known in the region that dates back from the earliest (Palaeolithic) period. Hengistbury Head includes evidence of occupation from Palaeolithic, Mesolithic and Neolithic times through the Bronze and Iron Ages until the end of the Roman period. A significant part of the Scheduled Monument at Hengistbury Head has been lost to erosion, particularly over the last 200 years. There is concern that continued erosion and rising sea levels will lead to a breach or overtopping at the location of Double Dykes and ultimately the complete loss significant features within the Monument.

Hurst Castle is an historic defence complex, including a mid-16th century stone castle, and defensive structures dating to the two World Wars. The Hurst Lighthouse, a Grade II Listed Building, is included within the complex. The Scheduled Monument is on Hurst Spit, which is at risk of the impacts of continued erosion and coastal processes. Rapid erosion after an intense storm in 2021 led to part of the east wing being undermined and collapsing, with areas of the west wing also being considered at risk.

**Table 6-2: Scheduled Monuments in the Strategy area**

| HER List Entry Number | Description | National Grid Reference |
|---|---|---|
| **1002350** | Bowl barrow | SZ 15287 92092 |
| **1002367** | Multi-period landscape on Hengistbury Head | SZ 17289 90789 |
| **1002369** | Staple Cross | SZ 17192 93808 |
| **1002371** | Site of Town Walls, in and east of, Druitt Gardens | SZ 15675 92723 |
| **1002397** | Two bowl barrows north west of Barn Cottage, Hengistbury Head | SZ 16354 91357 |
| **1002398** | Round barrow east of Southcliffe Road, Mudeford | SZ 19181 92814 |
| **1005579** | World War II pillbox and tank traps | SZ 15432 93353 |
| **1015699** | Hurst Castle and lighthouse | SZ 31663 89733 |
| **1018277** | Pre-conquest monastery | SZ 16015 92560 |

#### 6.2.1.3 Protected Wrecks

A number of wrecks exist offshore, including two British Dumb barges that were stranded in 1889, the S.B Hume which was stranded in 1895 and an English Merchant Vessel that was lost in 1884. All known wreck sites in the Strategy area are included in Table 6-3.

#### 6.2.1.4 Other Artefacts in the Historic Environment Record

Many artefacts have been found along this coastline to the west of Hurst Spit as the eroding cliff face reveals archaeological material, particularly at Barton-on-Sea. One find consisted of 128 implements including 97 Palaeolithic hand axes. A number of isolated finds of worked flint tools have been found in the Friars Cliff and Mudeford, dating from Prehistoric, Neolithic and Bronze Age eras, including a deserted Medieval village that included six salt houses. The only archaeological site above the cliffs that could be under threat from erosion are the earthworks at Taddiford Gap that may have been associated with the Medieval village of Hordle.

There is substantial evidence of submerged land surfaces within Christchurch Harbour. The presence of a Mesolithic occupation site, at Mother Siller's Channel on Stanpit Marsh, raises the possibility of other prehistoric, and later sites. Christchurch Bay also contains evidence of a submerged land surface. Evidence of human occupation includes worked flints from 12m depth, reported to be the deepest evidence of human occupation in the UK and estimated to be from 8,500 years ago when the western Solent was an extensive saltmarsh on the margin of a small estuary. A Neolithic hand axe, probably the finest ever found in Hampshire, has also been discovered offshore.

**Table 6-3: Protected Wreck sites in the Strategy area**

| Name | Site and Monument Record (SMR) | Location | Description | Period | National Grid Reference (NGR) |
|---|---|---|---|---|---|
| **Rachel Harrison** | SZ39SW 60 | Pennington Spit | Built in 1856, Wooden schooner stranded and lost in W force 4 on Pennington Spit on 24th January. | Post Medieval 1540 to 1900 | SZ 31880 91070 |
| **Triton** | SZ39SW 57 | Lymington | Wooden sailing vessel burnt and foundered off Lymington on 3rd December 1802. | | SZ 31880 91070 |
| **Providence** | SZ38NW 58 | | Wooden sailing cargo vessel stranded and lost on 26th February 1802. | | SZ 31770 89650 |
| **Surprise** | SZ38NW 57 | Hurst Castle | Wooden sailing cargo vessel stranded and lost near Hurst Castle on 23rd October 1780. | | SZ 31770 89650 |
| **Three Brothers** | SZ38NW 56 | Lymington | Wooden smuggling lugger lost between Lymington and Christchurch on 25th January 1775. | | SZ 31770 89650 |
| **Samuel** | SZ38NW 55 | | Wooden sailing, cargo vessel (170T) stranded and lost on 16th January 1753. | | SZ 31770 89650 |
| **Unknown** | SZ38NW 49 | Isle of Wight | Unknown vessel stranded at Cliff End, Isle of Wight, 1746. | | SZ 32900 89080 |
| **Saint** | SZ38NW 48 | Isle of Wight | British schooner stranded at Cliff End, Isle of Wight, 1904. | Modern 1901 to 1940 | SZ 32900 89080 |
| **Lively** | SZ38NW 47 | Totland Bay, Isle of Wight | English cutter foundered following a collision off Totland Bay, Isle of Wight, 1893. | Post Medieval 1540 to 1900 | SZ 32900 89080 |
| **Emma** | SZ38NW 46 | Colwell Bay, Isle of Wight | British smack stranded at Totland Bay, 1883. | | SZ 32900 89080 |
| **Foam** | SZ38NW 45 | Isle of Wight | French sloop stranded on Warden Ledge, Totland Bay, Isle of Wight, 1881. | | SZ 32900 89080 |
| **Providence** | SZ38NW 44 | Isle of Wight | English smack stranded at Warden Ledge, Colwell Bay, Isle of Wight, 1842. | | SZ 32900 89080 |
| **Tygar** | SZ38NW 4 | Isle of Wight | British vessel stranded at Cliff End, Colwell Bay, Isle of Wight, 1746. Forced ashore by a French privateer. | | SZ 32900 89080 |
| **Hind** | SZ38NW 40 | Hurst Castle | Royal Navy warship, 6th rate, lost near Hurst Castle,1709. | | SZ 31790 89700 |
| **Comet** | SZ38NW 39 | Hurst | English merchantman, lost at Hurst, West Solent, in 1888. Built 1858. | | SZ 31790 89700 |
| **Ann and Eliza** | SZ38NW 38 | Hurst Castle | English merchantman, lost near Hurst Castle, West Solent in 1859. | | SZ 31790 89700 |
| **Jessie** | SZ38NW 37 | Hurst | Schooner, lost on Chisel Strap. opposite Hurst, Solent, 1867. | | SZ 31790 89700 |
| **Hope** | SZ38NW 36 | Hurst Camber | Lost at Hurst Camber, Isle of Wight, in 1865. | | SZ 31790 89700 |
| **Archibald** | SZ38NW 35 | Hurst Castle | British schooner stranded on the beach at Hurst Castle, West Solent in 1880. | | SZ 31790 89700 |
| **Three Brothers** | SZ38NW 34 | Hurst Castle | British fishing smack, stranded 0.5 miles west of the Low Light, Hurst Castle, West Solent in 1876. Lost at same time as the Jemima (SZ38NW 33). Built in 1856. | | SZ 31790 89700 |
| **Jemima** | SZ38NW 33 | Hurst Castle | British fishing smack, stranded 0.5 miles west of Low Light, Hurst Castle, West Solent, 1876. Built 1852. | | SZ 31790 89700 |
| **Ann and Eliza** | SZ38NW 32 | Hurst Castle beach | British vessel stranded on Hurst Castle Beach, Solent, in 1859. Built in 1842. | | SZ 31790 89700 |
| **Friends** | SZ38NW 31 | Hurst Castle | British merchantman foundered near Hurst Castle, Solent, in 1853. | | SZ 31790 89700 |
| **Good Intent** | SZ38NW 30 | Hurst beach | British vessel stranded on Hurst Beach, Solent, in 1826. | | SZ 31790 89700 |
| **Good Intent** | SZ38NW 29 | Hurst Castle | British merchantman stranded near Hurst Castle, Milford, West Solent, in 1814. Wooden sailing vessel stranded and lost near Hurst Castle on 13th December 1814. | | SZ 31790 89700 |

| Name | Site and Monument Record (SMR) | Location | Description | Period | National Grid Reference (NGR) |
|---|---|---|---|---|---|
| **Unknown** | SZ38NW 4 | | Unknown Vessel | Modern 1901 to 1940 | SZ 30192 88246 |
| **Mabel** | SZ39SW 16 | Pennington Spit | Welsh brigantine, lost at Pennington Spit, Isle of Wight, 1870. | Post Medieval 1540 to 1900 | SZ 31880 91080 |
| **Unknown** | SZ39SW 6 | | Unidentified Feature | Unknown | SZ 32338 93417 |
| **Unknown** | SZ39SW 5 | | Unidentified Feature | | SZ 31362 91063 |
| **Unknown** | SZ39SW 4 | | Unidentified Feature | | SZ 31686 91065 |
| **S.B.Hume** | SZ29SE 21 | Milford-on-Sea | British brigantine, stranded at Milford-On-Sea, 1895. | Post Medieval 1540 to 1900 | SZ 28500 91450 |
| **Rose** | SZ29SE 20 | Hordle Cliff | British dumb barge, stranded at Hordle Cliff, Milford, Solent, 1889. | | SZ 28500 91450 |
| **Thistle** | SZ29SE 19 | Hordle Cliff | British dumb barge, stranded at Hordle Cliff, Milford, Solent, 1889. | | SZ 28500 91450 |
| **William & Eliza** | | Milford | English merchantman lost at Milford, near Hurst Castle Isle of Wight in 1884. | | SZ 28500 91450 |
| **Unknown** | | Christchurch Harbour | Vessel | 200 (Roman) | 417566E – 91585N |
| **Unknown** | | Christchurch Harbour | Sailing Vessel | 1796 | 418824E – 90880N |
| **Caroline Susan** | | | Vessel | 1940 | 422766E – 86077N |

#### 6.2.1.5 Conservation Areas

Conservation areas are of special architectural or historic interest, with a character or appearance which is desirable to preserve or enhance. The principal consideration in identifying a conservation area is its quality and interest, rather than individual buildings. Table 6-4 describes the 8 Conservation Areas in the Strategy area.

**Table 6-4: Conservation Areas in the Strategy area**

| Name | Description |
|---|---|
| **Avon Buildings** | Located adjacent to the River Avon in the centre of Christchurch, this conservation area encompasses a group of listed buildings of local interest. |
| **Bramble Lane** | Situated in an area to the north of Chewton Common Road, Bramble Lane comprises a number of residential developments from different historical periods. The oldest buildings were once part of an 18th Century hamlet. A number of the cottages are Grade II Listed and are of local interest. |
| **Christchurch Central Conservation Area** | Retaining its Saxon street plan and millstream, the character of the historic town centre is maintained through its network of narrow streets, the quality of its buildings and variety of architecture. The importance of the town centre is reflected in the number of statutory Listed and Local Interest Buildings that it contains. |
| **Milford-on-Sea** | This conservation area is centred around the green in the village centre and the church. The previously derelict White House hospital on the sea front at Milford has now undergone redevelopment, and is an important Listed Building and prominent coastal landmark. |
| **Mudeford Quay** | The Quay has a long association with the fishing community and this is reflected in the terraces of fishermen's cottages found in the area. These are grouped closely together with an inn on the head. The area also contains a number of listed cottages of the 17th and 18th century including Grade II 18th century house 'The moorings.' The historical interest and visual quality of the area are integral to the character. The Quay has particular policies to protect its historical and amenity interest within the Christchurch Local Plan. |
| **Purewell** | Purewell forms part of the suburban development extending east of Christchurch to Highcliffe, including Mudeford and Stanpit. The main feature of the settlement is Hengistbury Head, an important archaeological site. There are 13 statutory listed buildings which make an important contribution to the special historic and architectural interest of the area. |
| **Stanpit and Fishermans Bank** | Groups of white or cream rendered, or painted brick terraced cottages characterise the area. Other properties of interest include a Grade II Listed Building, a row of 18th century Coastguard cottages along Stanpit and The Watch House at Fisherman's Bank. |
| **Verno Lane** | The 19th Century Verno House lies here, based around a small farming hamlet which appears to have existed since the late 18th Century. Other key buildings include the Grade II Listed Little Thatch on Roeshot Hill, Verno House Lodge and outbuildings and Lilac Lodge on Hoburne Lane. |
| **Wick Village Conservation Area** | The village is known as the last village on the River Stour, with many listed buildings. The Round Barrow Scheduled Monument falls within this conservation area. |

### 6.2.2 Heritage at Risk Register

Historic England's Heritage at Risk Register includes Listed Buildings, Scheduled Monuments, Protected Wrecks and Conservation Areas at risk across England. There are two Scheduled Monuments at risk to the west of the Strategy area - two bowl barrows 405m north west of Barn Cottage, north west of Hengistbury Head.

### 6.2.3 Other Archaeological Features

There are other archaeological features within the Strategy area which are not part of designated sites, however they are important to the heritage of Christchurch Bay and Harbour. Many of these sites are recognised in the

archaeological research frameworks which have been developed regionally in the UK, to provide an effective structure for decision making regarding archaeological research. The frameworks comprise of:

1. Resource Assessment: an overview of the current state of knowledge and understanding in the region.
2. Research Agenda: recognition of the potential of the resource, gaps in our knowledge and an unprioritised list of research topics.
3. Research Strategy: a prioritised list of research objectives (seen as flexible over time), furthered by implementing specific Research Projects.

There are two archaeological research frameworks which cover the Strategy area: Solent Thames (Hampshire) and South West (Dorset). As well as these research frameworks, there are several resources which assess the Palaeolithic archaeology of the Strategy area.

In addition to the designated sites identified and considered at the FCERM Strategy level, it will be important for future FCERM schemes which emerge from the Strategy to adequately consider impacts not only these designated assets but also to evaluate and mitigate potential impacts on other nationally significant sites, and non-designated heritage assets, once scheme options and details are developed and understood in more detail.

## 6.3 Future Baseline

There is potential for pressure on the historic environment in the future, through development, coastal squeeze, coastal flooding and erosion exacerbated by climate change. Some heritage assets are already at risk of neglect, decay, or inappropriate development, as identified in the Heritage at Risk Register. Some of these assets may be compromised further by coastal flooding or erosion in the future. Furthermore, there are several national and local policies and strategies which have been implemented to protect these assets. As such, it is likely that the implementation of the Strategy can lead to enhancement of the quality of the historic environment by offering better protection from coastal flooding and erosion.

Within the strategy area there are also buried archaeological resources which are not fully understood at present. This includes buried off-shore channels (extensions of the current onshore drainage network) mapped as part of offshore projects in this area. Protection of the coastline in the future could support protection of these archaeological resources, however construction in the foreshore could also negatively impact these buried resources where they are undiscovered.

## 6.4 Key Issues

European, national and local policies and strategies seek to protect and enhance the historic environment within the Strategy area. Although some heritage assets feature on the Heritage at Risk Register, they are not at risk for reasons pertaining to flood risk management. There are some other heritage assets within the Strategy area which are located in areas of flooding and coastal erosion risk. Buried archaeological resources could also be at risk in the future, through the construction of new coastal defences.

It is important that these assets are protected and enhanced where possible to maintain their integrity and importance. There are potential future pressures in coastal squeeze climate change and development, though it is likely that the Strategy can contribute to reducing some of these pressures through reduced flooding and erosion impacts to the assets and improved management of the coastal zone.

## 6.5 Scoping Outcome

The **Historic Environment theme has been scoped in to the SEA**, as there is potential for significant effects upon heritage assets and their settings. It is also important that the wider character of the built and natural environment is protected and enhanced. Although adjacent strategies such as the Lower Avon and Stour flood risk management projects and Hurst Spit to Lymington Coastal Flood and Erosion Risk Management Strategy are still being developed, and their outcomes are not yet known, the potential for in combination effects on key historic environment assets and conservation areas must be considered, or at least in the appraisal and development of future schemes in these areas of overlap or adjacency.

## 6.6 SEA Objective

Table 6-5 presents the SEA objective and appraisal questions that will be used to assess the Strategy in relation to this theme.

**Table 6-5: SEA Framework of objectives and assessment questions: Historic Environment**

| SEA Objective | Supporting Questions (will the policy option help to…) |
|---|---|
| To protect, conserve and enhance the historic environment within the Strategy area. | • Conserve and enhance designated and non-designated heritage assets and their settings?<br>• Conserve and enhance the special interest, character and appearance of locally important features and their settings?<br>• Consider the contribution of historic places to the character of the coastal environment?<br>• Support access to the historic environment? |

# 7. Land, Soil and Water Resources

This section focuses on the quality of soil and mineral resources, water supply, water quality and fisheries in the Strategy area.

## 7.1 Policy Context

Table 7-1 presents the most relevant documents identified for managing land, soil and water resources in the Strategy area.

**Table 7-1: Plans, policies and strategies reviewed in relation to land, soil and water resources**

| Policy | Year of publication | Weblink |
|---|---|---|
| **Water Framework Directive (2000/60/EC)** | 2000 | https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060 |
| **National Flood and Coastal Risk Management Strategy for England** | 2020 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920944/023_15482_Environment_agency_digitalAW_Strategy.pdf |
| **National Planning Policy Framework (NPPF)** | 2021 | https://www.gov.uk/government/publications/national-planning-policy-framework--2 |
| **A Green Future: Our 25 Year Plan to Improve the Environment** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf |
| **South Inshore and South Offshore Marine Plan** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726867/South_Marine_Plan_2018.pdf |
| **Safeguarding our Soils: A strategy for England** | 2009 | https://www.gov.uk/government/publications/safeguarding-our-soils-a-strategy-for-england |
| **Future Water: The government's water strategy for England** | 2011 | https://www.gov.uk/government/publications/future-water-the-government-s-water-strategy-for-england |
| **Environmental Land Management Schemes** | 2021 | https://www.gov.uk/government/publications/environmental-land-management-schemes-overview/environmental-land-management-scheme-overview |
| **South East River Basin District River Basin Management Plan** | 2016 | https://www.gov.uk/government/publications/south-east-river-basin-district-river-basin-management-plan |
| **South West River Basin District River Basin Management Plan** | 2016 | https://www.gov.uk/government/publications/south-west-river-basin-district-river-basin-management-plan |
| **South East River Basin District FRMP 2015 to 2021** | 2016 | https://www.gov.uk/government/publications/south-east-river-basin-district-flood-risk-management-plan |
| **South West River Basin District FRMP 2015 to 2021** | 2016 | https://www.gov.uk/government/publications/south-west-river-basin-district-flood-risk-management-plan |
| **Bournemouth Local Plan** | 2012 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Bournemouth/Docs/Core-Strategy-1.pdf |

| Policy | Year of publication | Weblink |
|---|---|---|
| **Christchurch and East Dorset Local Plan** | 2014 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Christchurch/docs/christchurch-and-east-dorset-adopted-core-strategy.pdf |
| **New Forest District Council Local Plan 2016 - 2036** | 2020 | https://www.newforest.gov.uk/media/705/Local-Plan-Document-2016-2036/pdf/Local_Plan_2016-2036_Part_One_FINAL.pdf?m=637329191351130000 |
| **Bournemouth, Christchurch, Poole and Dorset Mineral Sites Plan** | 2019 | https://www.dorsetcouncil.gov.uk/planning-buildings-land/planning-policy/dorset-county-council/minerals-planning-policy/mineral-sites-plan/mineral-sites-plan.aspx |
| **New Forest National Park Local Plan 2016 - 2036** | 2019 | https://www.newforestnpa.gov.uk/app/uploads/2019/09/Local-Plan-2016-2036-finalforweb.pdf |
| **Hampshire Minerals and Waste Plan** | 2013 | https://www.hants.gov.uk/landplanningandenvironment/strategic-planning/hampshire-minerals-waste-plan |
| **South West Water Bournemouth Water – Final Water Resources Management Plan (WRMP)** | 2019 | https://www.southwestwater.co.uk/SysSiteAssets/document-repository/environment/sww-bw-wrmp19---finalplan_aug2019.pdf |
| **New Forest District Council Contaminated Land Strategy** | 2018 | https://www.newforest.gov.uk/media/1182/Contaminated-Land-Policy/pdf/Contaminated_Land_Strategy_2018.pdf?m=637402772197500000 |

The Strategy will be developed in accordance with the National FCERM Strategy, which highlights the importance of nature based solutions in FCERM to improve our natural environment whilst reducing flooding and erosion risks. This includes avoiding inappropriate development in the floodplain and highlighting the environmental benefits associated with schemes. Nature based solutions will also help to support the ambitions of the 25 year Environment Plan. The South East and South West Flood Risk Management Plans (DEFRA, 2016) discuss the importance of preventing flood risk, ensuring that any new development is appropriate, safe and does not increase flood risk elsewhere. Measures are also in place to reduce the likelihood of flooding through habitat creation, realigning flood banks, implementing property level protection and improving the standard of protection of river and coastal defences.

The South Offshore and South Inshore Marine Plan (HM Government, 2018) includes a number of objectives and policies related to land, soil and water resources which the Strategy will be in accordance with. This includes contributing to the achievement of maintenance of Good Ecological Status under the Water Framework Directive, avoiding impacts of development on the water environment and delivering benefits or enhancements to the water environment and water quality where possible. Furthermore, developments should safeguard ecosystem services associated with fisheries and support resilience of the sustainable fishing industry. Both the South East and South West River Basin Management Plans (DEFRA, 2016) also include aims for enhancing the water environment in accordance with the Water Framework Directive.

Any flood and coastal erosion management schemes that come forward and require planning permission will be required to adhere to the NPPF in terms of recognising the wider benefits associated with ecosystem services. This includes preserving and enhancing high quality soil resources, water quality and water resources through the implementation of coastal defence measures to minimise the impacts of climate change.

This is supported by the upcoming Environmental Land Management (ELM) Schemes, which will pay farmers and other land managers to deliver clean air and water, thriving plants and wildlife, protection from environmental hazards, reduction of and adaptation to climate change and beauty, heritage and engagement with the environment. This also helps to implement the soil strategy for England, which seeks to reduce soil degradation and manage it sustainably by 2030, and the national water strategy which aims to secure sustainable water resources and improve water quality. These plans are supported by the Local Plan policies for BCP Council, NFDC and the New Forest National Park.

The baseline assessment of the contaminated land sites within the Strategy area will enable the Strategy to ensure all coastal management measures are suitable for the land conditions. The NFDC Local Plan recognises the importance of remediation of contaminated, polluted or unstable land before it can be used for other purposes. NFDC's Contaminated Land Strategy sets out further detail on how the Environmental Protection Act 1990 will be implemented, with contaminated land sites identified and guidance for further site assessments.

## 7.2 Current Baseline

### 7.2.1 Topography

The topography of the Strategy area is shown in Figure 7-1. Christchurch Harbour is predominantly comprised of relatively low, flat topography. The highest ground is located along the cliff sections of Christchurch Bay, with Highcliffe to Barton-on-Sea reaching 50 metres above Ordnance Datum (mAOD), then lowering towards the eastern end of the Strategy area at Milford-on-Sea.

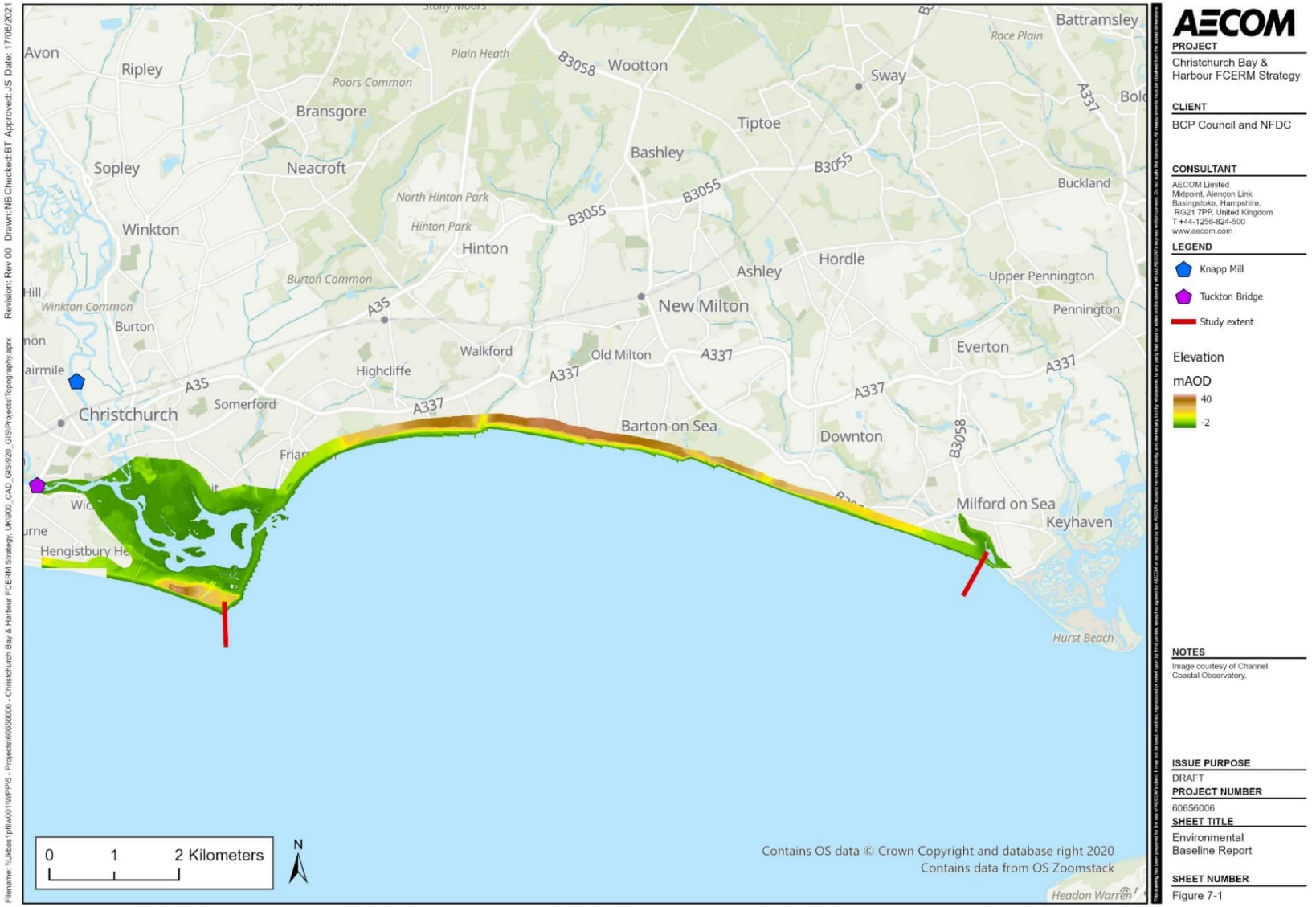


**Figure 7-1: Topography of the Strategy area**

### 7.2.2 Minerals and Waste

There is no mineral production in the Strategy area, and no sites for mineral development have been identified in the BCP Council Mineral Sites Plan or the Hampshire Minerals and Waste Plan.

### 7.2.3 Soil Resources

The Agricultural Land Classification (ALC)[13] classifies land into six grades, plus 'non-agricultural' and 'urban'. Grades 1 – 3a are recognised as the best and most versatile land (BMV) and Grades 3b – 5 are of poorer quality. There is very little agricultural land in Christchurch Harbour as it is highly developed, however there are inputs of eroded material and nutrients moving downstream from the Avon and Stour catchments. To the north in Purewell there is a small area of Grade 4 agricultural land which is used for rough grazing and horticultural crops.

To the east of Christchurch Harbour, agricultural land between Hurst Spit and Milford is of varying quality and characterised as open coastal plain by Hampshire County Council. At Stanpit and Hengistbury, there are areas of conservation grazing and agri-environment schemes. The majority of the area around Keyhaven, up to the boundary of Milford-on-Sea, is Grade 2.

In New Milton and Milford-on-Sea, the main agricultural uses are livestock rearing and arable crop production. Land between Milford and Barton is predominately Grade 3, and broken up by a strip of Grade 4 along this length which consists of large open fields of pasture and arable land. The remainder of this area is residential and not used for agriculture. Parts of Hurst Spit and Milford-on-Sea are designated under Avon Water Nitrate Vulnerable Zone (NVZ). It is at risk from agricultural nitrate pollution, and must not use nitrogen fertiliser or store organic manure.

The Avon Valley is classified as an Environmentally Sensitive Area (ESA), designated in 1993. It is a voluntary scheme whereby farmers and landowners receive annual payments for entering into a ten-year management agreement. The ESA has four environmental objectives:

- To maintain and enhance landscape quality and wildlife conservation value by retention of existing grassland and by increasing the area of grassland;
- To enhance the wildlife conservation value of wet grassland without detriment to the landscape by maintaining higher water levels in ditches and watercourses;
- To maintain and enhance landscape quality through management of characteristic landscape elements;
- Maintain and enhance the archaeological and historic features.

### 7.2.4 Water Resources

The watercourses in the Strategy are shown in Figure 7-2. The principle watercourses in the Strategy area are the River Avon and the River Stour, which converge at Christchurch Harbour. The River Avon flows in a southerly direction from Knapp Mill towards Christchurch Bay. The River Stour enters the Strategy area from Tuckton, flowing in a south easterly direction to Christchurch Bay. Tributaries of these watercourses include the River Mude. Other watercourses in the Strategy area include Becton Bunny at Barton-on-Sea, the Walkford Brook which flows to Chewton Bunny and Danes Stream which flows through Milford-on-Sea.

The Strategy area is served by Bournemouth Water (with wastewater facilities supplied by Wessex Water and Southern Water), and their Water Resource Management Plan identifies supply and demand from 2017/18 to 2044/45. The supply-demand balance in the Strategy area is not predicted to be under pressure in the next 25 years, with a small (<3%) supply-demand deficit only identified in 2045 for non-household demand. These water companies are also in the process of developing Drainage and Wastewater Management Plans (DWMP) to plan for future drainage, wastewater and environmental water quality.

Towards the eastern end of Barton-on-Sea, there is a Southern Water pumping station which pumps to Pennington WWTW, with emergency overflow that discharges into the sea at Marine Drive East. At Mudeford Sandbank, there is a sewerage system including four pumping stations which run underneath the Harbour entrance channel towards Mudeford Quay. There are two large chambers within Mudeford Quay, which connect to the sewage disposal facilities at Mudeford Sandbank via a 1m diameter concrete tunnel built underneath The Run.

[13] Natural England (2021) Guidance to assessing development proposals on agricultural land [online] Available from: https://www.gov.uk/government/publications/agricultural-land-assess-proposals-for-development/guide-to-assessing-development-proposals-on-agricultural-land [Accessed 16 June 2021

There are a number of licensed ground water abstraction sites for spray irrigation purposes, all of which are less than 50,000 $m^3$ per annum. Five of these are in the vicinity of Walkford Brook and one is located to the east of Becton Bunny. There are also three surface water abstractions within, or just outside the study area. Two abstractions of less than 50,000 $m^3$ for spray irrigation purposes are located at Walkford Brook and Danes Stream. There is also an abstraction at Becton Bunny of less than 50,000 $m^3$, which may be for gravel washing, fish farming or impoundments.

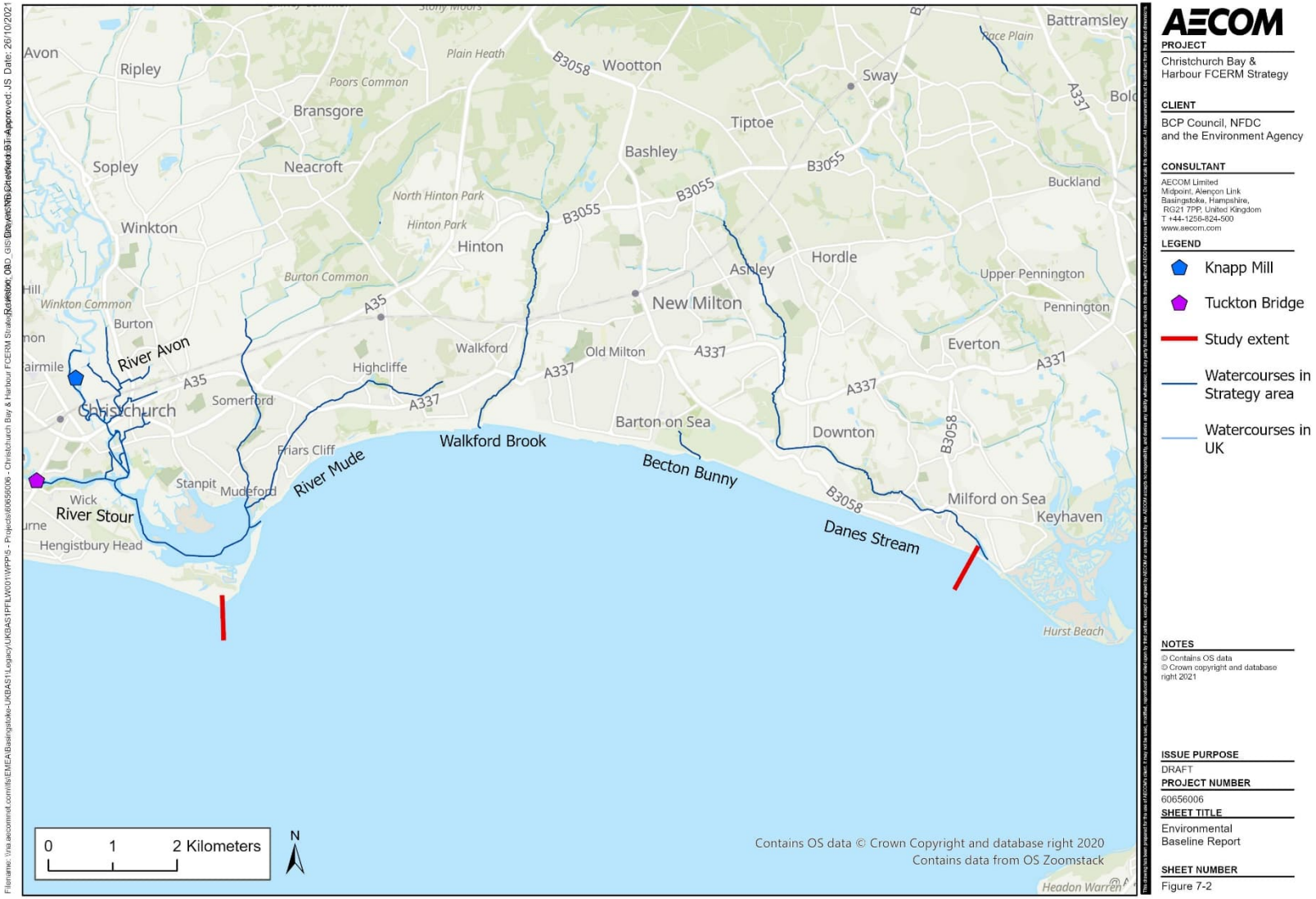


**Figure 7-2: Watercourses in the Strategy area**

## 7.2.5 Water Quality

The quality of the coastal waters is dependent on natural effects, such as weather and ocean currents, and human influences such as discharge of sewage, industrial waste and other pollutants. The Hampshire Avon Partnership and the Stour Catchment Partnership provide information on the quality of the two main rivers in the Strategy area – the River Avon and the River Stour.

### 7.2.5.1 Water Framework Directive

The watercourses identified in Figure 7-2 fall within the Avon Hampshire, Becton Bunny and New Forest – Lymington and Beaulieu operational catchments, and the Dorset / Hampshire coastal operational. All watercourses have a Water Framework Directive (WFD) classification of 'good' or 'moderate' for ecological status, but fail in terms of their chemical status. Reasons for not achieving good status across the watercourses include sewage, poor nutrient management, surface water abstraction, natural mineralisation and trade/industry discharge.

### 7.2.5.2 Urban Waste Water Treatment Directive

Data is collected from Christchurch Harbour, the freshwater inputs to the harbour, and Christchurch Wastewater Treatment Works (WWTW) which discharges into the harbour. The samples are analysed to determine if the harbour should be defined as a sensitive area which is eutrophic due to nutrient inputs.

The recent data from 2020 shows Christchurch Harbour to be compliant with discharges and not a sensitive area.

### 7.2.5.3 European Bathing Water Directive

As part of the European Bathing Water Directive (76/160/EEC), the Environment Agency tests the quality of seawater along the beaches in Christchurch Bay during the summer (15th May to 30th September) for amenity value and to protect public health. Sampling commences two weeks before the start of the season, with twenty samples taken at regular intervals throughout the season at each site. All samples are taken at predetermined points where the daily average density of bathers is at its highest.

Tested sites in the Strategy area are Avon Beach, Friars Cliff, Highcliffe, Highcliffe Castle, Mudeford Sand Bank, Barton-on-Sea and Milford-on-Sea. Based on samples from 2016 to 2019, the recent classification for all sites is excellent.

## 7.2.6 Fisheries

Commercial fishing takes place in Christchurch Harbour and along stretches of the bay. The Southern Inshore Fisheries and Conservation Authority (Southern IFCA) has jurisdiction over commercial fishing activity within the Strategy area, and manages all activities through a system of byelaws which restrict fishing for certain species through the implementation of closed seasons.

As part of the licensing for ongoing beach management activities, BCP council has undertaken fish surveys to understand the potential impact of beach renourishment on fisheries. BCP Council will also be undertaking dive surveys this year (including within Christchurch ledge) to understand if there is any impact from beach nourishment on the ledge.

Figure 7-3 presents the most recent fish survey from Christchurch Harbour, carried out in June 2021. The species of fish vary between Wick Hams and Mudeford Spit, with Goby spp. Being the most abundant species at Wick Hams, and Herring the most abundant at Mudeford Spit.

Licensed netting for salmon and migratory trout takes place in Christchurch Harbour, the joint estuary of the Rivers Avon and Stour, in the Mudeford run, the narrow mouth of the estuary, and from the beach within the public fishery part of the harbour. Fishing is solely by means of seine nets. The number of nets is limited to six in accordance with the NRA (Poole Harbour and Christchurch Harbour) (Limitation of Draft and Seine Net Licences) Order 1993, and these are licensed by the Environment Agency. Christchurch Harbour also has sub-littoral habitats around Hengistbury Head which are important for crabs and lobster. Christchurch Bay is important for fin fish species, which are targeted through a variety of measures as well as potting for whelks.

The River Stour supports a range of sport fishery types, all are catch and release in nature. Small numbers of salmon and sea trout ascend the Stour, although few are caught to maintain stocks for conservation. The river is now primarily a coarse fishery, with very limited trout fishing. Some commercial fishing for eels takes place using fixed eel traps at various locations on the lower River Avon.

There are no designated areas for freshwater fisheries, the nearest being in the lee of Hurst Spit towards Keyhaven.

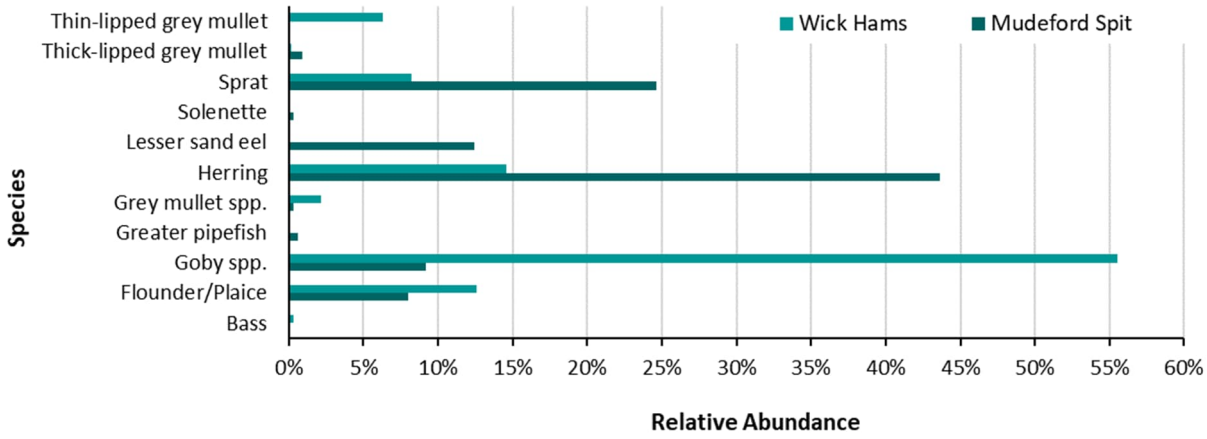


**Figure 7-3: Christchurch Harbour Fish Survey (June 2021)**

## 7.2.1 Contaminated Land

Contaminated land has implications on coastal management measures that can be considered, and these measures in turn have the potential to influence or improve current issues associated with contaminated land. Management of the coast where there are areas of contaminated land can lead to beneficial remediation and environmental enhancement. For example, implementation of new defences along a contaminated coastline at risk of coastal flooding or erosion can remove a current pollution hazard by blocking the pathway that is linking sources (e.g. former landfill sites) to receptors (e.g. environmentally sensitive habitats).

A desktop study was completed as part of the environmental baseline report, to assess contaminated land risk within the Strategy area. This was carried out in line with CIRIA Guidance C718[14], using the EA's Historic Landfill dataset to establish the risk of contamination. This assessment highlighted the key issues and potential contamination areas for the Strategy, rather than providing specific details of minor contaminants found at localised sites. The process of identifying potential contamination utilised GIS spatial analysis, considering potential sites where pollution sources may be present, the possible pollutant linkages relevant to The Strategy (i.e. through coastal flooding and erosion), and potential receptors.

Each Historic Landfill was classified according to the potential contamination risk to receptors, based on the risk of flooding and coastal erosion rather than what contaminants are potentially within each of the sites. This assessment found that 7 out of the 13 sites within the Strategy area are at risk of flooding and/or coastal erosion in the present day; 5 sites may be at risk in the future over the next 100 years, and 1 site is not considered to be at risk.

At present, there is insufficient data to confirm whether the high risk sites would meet the statutory definition of Contaminated Land in Part IIA of the Environmental Protection Act 1990. To confirm the contamination status of these areas, further detailed site studies and intrusive surveys would be required to understand what contaminants are present in these sites. This would establish whether significant harm is being caused, or if there is a significant possibility of significant harm being, or likely to be caused to the identified receptors or pollution of controlled waters.

# 7.3 Future Baseline

Impacts of coastal flooding and erosion on land, soil and water resources in the future are likely to be complex, due to the interrelations between them. In the future there is likely to be an increase in the frequency and severity of extreme weather events, which may lead to increased erosion and degradation of land. Development pressure may also impact water resources; without the use of SuDS, more impermeable surfaces are likely to increase surface runoff which could mobilise pollutants and compromise water quality.

Increased surface run off, combined with increased coastal flooding and erosion, may increase incident of pollution through mobilisation of contaminants from historic landfill sites to the wider area and water resources, as identified

[14] CIRIA (2013) C718: Guidance on the Management of Landfill Sites and Land Contamination on Eroding or Low-lying Coastlines. Available from: https://www.ciria.org/ItemDetail?iProductCode=C718&Category=BOOK [Accessed 06 July 2021]

in the risk assessment for contaminated land in Section 7.2.1. This is likely to be worse in areas where the coastal defences are deteriorating or are subject to overtopping.

There is also potential for degradation of both the countryside and urban environment through increased flooding affecting land drainage and increased pressure from development. However, there are several national and local plans and policies in place to preserve and enhance land, soil and water resources. The Strategy, which aims to protect and enhance the coastline and its assets, may prevent some of these losses in the future with the support of nature-based solutions.

## 7.4 Key Issues

Christchurch Harbour is predominantly low topography, in comparison to the cliff sections along Christchurch Bay. Historic erosion rates suggest retreat of these cliffs and beaches in the future, which could impact land and soil resources. Although there is little agricultural land in Christchurch Harbour, there is agricultural land of varying quality further along the bay towards New Milton and Milford-on-Sea.

The principle watercourses in the Strategy area are the River Avon and the River Stour, and there are several tributaries throughout the Strategy area (Becton Bunny at Barton-on-Sea, the Walkford Brook and Danes Stream). Fishing is a popular activity in the Strategy area, both commercial and recreational, particularly at Christchurch Harbour, the River Stour and the River Avon.

The Water Resource Management Plan has not identified pressure on the supply-demand balance in the Strategy area in the next 25 years, with a small (<3%) supply-demand deficit only identified in 2045 for non-household demand. Water quality is monitored by three European Directives: the Water Framework Directive, Urban Waste Water Treatment Directive and the European Bathing Water Directive. All of the watercourses in the Strategy area have a WFD classification of 'good' or 'moderate' for ecological status, but fail in terms of their chemical status. Christchurch Harbour is compliant with the Urban Waste Water Directive, and all bathing waters tested have a classification of excellent for 2019.

A desktop study has identified potential areas of contaminated land, using the EA's historic landfill dataset, and the CIRIA Guidance C718 to define a framework to assess the risks to potential receptors. The receptors include people, properties, environmental designations and watercourses. Increased coastal flooding and erosion in the future is likely to present pathways for contamination to these receptors.

## 7.5 Scoping Outcome

The **Land, Soil and Water Resources theme has been scoped in to the SEA**, as there is potential for significant effects through the implementation of new coastal management measures. As part of the Strategy development, a WFD Assessment will be carried out to fully consider the impacts of the Strategy on water resources.

## 7.6 SEA Objective

Table 7-2 presents the SEA objective and appraisal questions that will be used to assess the Strategy in relation to this theme.

**Table 7-2: SEA Framework of objectives and assessment questions: Land, Soil and Water Resources**

| SEA Objective | Supporting Questions (will the policy option help to…) |
|---|---|
| To ensure the efficient and effective use of land in the Strategy area. | • Protect and conserve soils and improve resilience to degradation?<br>• Protect and conserve the best and most productive agricultural land?<br>• Prevent contamination from historic landfill sites and support remediation? |
| To protect and enhance water quality, and manage water resources within the Strategy area in a sustainable manner. | • Help secure compliance with the Water Framework Directive and contribute to enhancing the status of water bodies?<br>• Contribute to the sustainable management of water resources and fisheries? |

# 8. Population and Communities

This section focuses on the demographics, health and wellbeing of the communities in the Strategy area.

## 8.1 Policy Context

Table 8-1 presents the most relevant documents identified for population and communities.

**Table 8-1: Plans, policies and strategies reviewed in relation to population and communities**

| Policy | Year of publication | Weblink |
|---|---|---|
| **National Flood and Coastal Risk Management Strategy for England** | 2020 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920944/023_15482_Environment_agency_digitalAW_Strategy.pdf |
| **National Planning Policy Framework (NPPF)** | 2021 | https://www.gov.uk/government/publications/national-planning-policy-framework--2 |
| **South Inshore and South Offshore Marine Plan** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726867/South_Marine_Plan_2018.pdf |
| **Bournemouth Local Plan** | 2012 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Bournemouth/Docs/Core-Strategy-1.pdf |
| **Christchurch and East Dorset Local Plan** | 2014 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Christchurch/docs/christchurch-and-east-dorset-adopted-core-strategy.pdf |
| **New Forest District Council Local Plan 2016 - 2036** | 2020 | https://www.newforest.gov.uk/media/705/Local-Plan-Document-2016-2036/pdf/Local_Plan_2016-2036_Part_One_FINAL.pdf?m=637329191351130000 |
| **New Forest National Park Local Plan 2016 - 2036** | 2019 | https://www.newforestnpa.gov.uk/app/uploads/2019/09/Local-Plan-2016-2036-finalforweb.pdf |

The Strategy will be developed in accordance with the National FCERM Strategy, aiming to provide protection from flooding and coastal erosion to the communities within Christchurch Bay & Harbour. It must support communities to better prepare and respond to flooding and coastal erosion, help support them with managing long-term impacts, and give them a say in the management solutions that are developed in the area.

Any flood and coastal erosion management schemes that come forward and require planning permission will adhere to the requirements of the NPPF, implementing coastal defence measures to retain access to community services and facilities, including health facilities, educational facilities and open space, recognising the importance of community needs and interests. The Strategy will also adhere to the policies set out in the South Inshore and South Offshore Marine Plan, ensuring that it supports diversification of activities which improve socio-economic conditions where possible. This will also be in line with Local Plan policies which relate to housing, community services and facilities, accessibility and infrastructure requirements. It will also protect access to the coast to safeguard recreational activities which improve the health and wellbeing of the local community. All three of the local plans for the Strategy area include policies which support the protection and growth of recreation for the region.

The Health Protection Agency has published advice for flooding, which outlines the main threats to public health during and immediately after a flood event. In addition to physical injuries, mental health and wellbeing are considered flood hazards.

# 8.2 Current Baseline

## 8.2.1 Population

The Strategy area of Christchurch Bay and Harbour is divided into the following parishes:

- Christchurch;
- Highcliffe and Walkford;
- Milford-on-Sea; and,
- New Milton.

The towns and villages to the east of Christchurch are mainly residential, with tourism and service industries providing the main form of employment. As seaside settlements, they generally have an older average population as popular retirement destination. Table 8-2 shows the population estimates from the Office for National Statistics (ONS) 2011 Census results[15].

**Table 8-2: 2011 Population estimates for the Strategy area**

| Area | 2011 Population Estimate |
|---|---|
| Christchurch | 54,210 |
| Highcliffe and Walkford | 12,681 |
| Milford-on-Sea | 4,647 |
| New Milton | 25,710 |
| **Strategy area** | 101,489 |
| **BCP Council** | 392,419 |
| **NFDC** | 176,462 |
| **South West of England** | 5,281,000 |
| **England** | 53,010,000 |

## 8.2.2 Health

The health of the populations in both the BCP area and NFDC area, is generally better than the England average[16]. The life expectancy for both men and women is greater in the BCP and NFDC areas than the average for England, as are the mortality rates for all people under 75 for all causes. For BCP , crude mortality rates (deaths per 1,000 people) have decreased from 13.3 to 11.7 between 2011 and 2019; for NFDC, crude mortality rates have increased from 11.3 to 12.5 between 2011 and 2019[17].

The Indices of Deprivation (IoD) measure relative deprivation at a local area level across England, considering income, employment, education, health, crime, barriers to housing and services and the living environment. All of these elements combined form the Index of Multiple Deprivation (IMD), which ranks each area in England from 1 (most deprived area) to 32,844 (least deprived area). In 2019, the BCP area and NFDC area had an IMD rank of 14,820.73 and 10,782.29 respectively[18].

## 8.2.3 Christchurch

The town of Christchurch borders the northern edge of Christchurch Harbour. It is a residential town and tourist hotspot, providing locally important services and attracting approximately 1.5 million visitors per year. More than 30% of the population here is aged 65 and over, which is the highest percentage of retired people in any district in the Country. Most of the buildings are residential although there is some holiday accommodation in the form of

[15] Office for National Statistics (2018) Population estimates for Parishes in England and Wales, mid-2002 to mid-2017 [online] available from: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/adhocs/009305populationestimatesforparishesinenglandandwalesmid2002tomid2017 [Accessed 17 June 2021]
[16] Public Health England (2020) Local Authority Health Profiles [online] available from: https://fingertips.phe.org.uk/profile/health-profiles [Accessed 06 August 2021]
[17] Office for National Statistics (2021) Deaths registered by area of usual residence, UK [online] available from: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/deathsregisteredbyareaofusualresidenceenglandandwales [Accessed 06 August 2021]
[18] Office for National Statistics (2019) English indices of deprivation 2019 [online] available from: https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019 [Accessed 06 August 2021]

hotels, guest hotels and bed and breakfast establishments; these are predominantly located in Mudeford and Stanpit. Static caravans are situated at Sandhills, adjoining the coast and situated close to Mudeford Quay.

Christchurch lies in a green belt which extends into Dorset and Hampshire, in place to reduce urban sprawl and prevent further convergence with the towns in South East Dorset, protect the identity of the community and preserve nearby countryside.

### 8.2.4 Highcliffe and Walkford

Highcliffe and Walkford parish consists of the two villages, located adjacent to the coastline, in close proximity to the New Forest National Park. This has established the areas as a popular tourist destination particularly for Highcliffe and Friars Cliff beaches, however the houses are largely residential, rather than holiday accommodation.

### 8.2.5 Milford-on-Sea

Milford-on-Sea originated in the centre of an agricultural parish, when the coastline was further south than it is now. Much of the parish is still recognised and protected from urbanisation by the surrounding green belt, recognising the high quality soil resources for agricultural use. The village is still centred around the village green, although it has expanded rapidly over the past 100 years. There has been substantial redevelopment at the western end of the cliff top in recent years, both residential and in support of the strong tourism economy here. There are large open spaces (Hordle and Rook Cliff) as well as Studland Common and sports grounds to the west of the village, and popular shingle beaches.

### 8.2.6 New Milton

New Milton is a modern settlement, an expansion of Old Milton, which includes the village of Barton-on-Sea. Barton-on-Sea comprises mainly suburban housing developments, with some holiday parks located here. There are some large areas of public open space along the cliff tops at both settlements.

### 8.2.7 Recreation and Wellbeing

There are several coastal recreational areas within the Strategy area which are vital to the community's character, and support the health and wellbeing off Christchurch Bay & Harbour.

The beaches within Christchurch Bay & Harbour include Highcliffe Castle Beach, Highcliffe Beach, Gundimore, Mudeford, Friar Cliff, Avon Beach, Naish Beach, Barton-on-Sea Beach, Hordle Cliff Beach and Milford-on-Sea. There are beach huts located at Mudeford Sandbank, Avon Beach, Hordle Cliff, Milford-on-Sea and Barton-on-Sea, which remain a popular and traditional element of the coastline although many are now at risk of flooding and coastal erosion. Mudeford Sandbank also has a wide range of supporting facilities such as buried services / a sewage system and pumping stations. There are also two golf courses – one at Highcliffe and one at Barton-on-Sea – and the clifftops at Barton-on-Sea are often used by paragliders. There are also two golf courses – one at Highcliffe and one at Barton-on-Sea. Bathing and swimming are popular at these beaches, as Christchurch Bay is designated as bathing waters for the 2021 season under the Bathing Waters Regulations 2013.

Recreational fishing also takes place along the coastline, including shore and coarse fishing. Recreational bass fishing is popular at the mouth of the Harbour, although the fishing rights extend along a considerable length of the Harbour bank.

There is a significant sailing community within Christchurch Harbour, with three sailing clubs (Christchurch, Highcliffe and Mudeford) located there. The Harbour is also a base for Christchurch rowing club, host to national competitions for windsurfing and a popular location for kayaking and paddle boarding. Mooring facilities for boats is dictated by the physical nature of the Harbour, although the existing moorings are being used to their full potential. Large areas of the Harbour are accessible to the public for recreation, and leisure boats can be hired from the Quay. Similarly at Milford-on-Sea there are opportunities for water based recreation, including Hurst Castle Sailing Club, The New Forest Paddle Sport Company, and Keyhaven Yacht Club. Keyhaven Harbour is also a launch site with moorings located behind the spit. Surfing is also popular at Avon beach.

Away from the beach, the Strategy area features two historical castles: Christchurch Castle and Highcliffe Castle. Hurst Castle is located adjacent to the study area, at the eastern end of Hurst Spit. The Red House Museum and Gardens is another popular site; located in Christchurch town centre, it dates back to 1764 when it was originally a workhouse and provides an insight into the heritage of Christchurch, including information on natural history, geology and archaeology. Next to Christchurch Quay is the Quomps, an open grassed area containing a splash park and children's play area.

Other open spaces in the Strategy area provide recreational value for the local community, many of which are discussed in Section 0 as they are designated nature conservation sites. Stanpit Marsh Nature Reserve, located on the north side of Christchurch Harbour, is an important 65 hectare LNR with habitats including salt marsh with creeks, salt pans, reed beds, freshwater marsh, gravel estuarine banks and sandy scrub. Steamer Point is another LNR situated between Highcliffe Castle and Friars Cliff, which covers 11 hectares of deciduous woodland, with areas of grassland, ponds, wetland and sea cliffs.

A coastal footpath (the national footpath Barton to Hurst), provides access along the coastline from Mudeford Quay to Chewton Bunny, which is important for visitors and local residents. A number of amenity car parks exist at various points along this stretch of coast including Avon Beach, Highcliffe, Barton-on-Sea and Milford-on-Sea. There are two public car parks within the Purewell area of Christchurch, and several other small car parks within the Strategy area. Traffic congestion can be high in this area, particularly around the summer months when there is more tourism.

## 8.3 Future Baseline

Development pressures and coastal flooding and erosion impacts associated with climate change are likely to increase in the future, negatively affecting the communities within Christchurch Bay & Harbour. Those located adjacent to the coastline such as Highcliffe and Walkford, Milford-on-Sea and Barton-on-Sea are likely to experience coastal erosion, with potential loss of assets. Flooding in Christchurch Harbour could lead to loss of life, which is of particular concern due to the vulnerability of the population here as 30% are aged 65 and over. The NFDC Local Plan predicts an ageing population, with the population ages 65 and over projected to increase by 40% between 2016 and 2036. Similarly in the Christchurch and East Dorset Local Plan, the working population is predicted to drop from 50% to 47% by 2033.

The coastal recreation areas will continue to be popular amongst residents and tourists in the future, though they are also subject to pressure from coastal flooding and erosion. There is potential for the beaches, nature conservation sites and coastal footpaths along Christchurch Bay to be lost through erosion, and more frequent flooding and extreme weather events may impact water sports and fishing activities.

The Strategy would outline the measures and options to provide resilience to the coastline in the future, against the risks of coastal flooding and erosion, protecting the community and their assets. There are also opportunities for the Strategy to enhance access to the coast and open space, improving the existing infrastructure to allow for more coastal recreation.

## 8.4 Key Issues

Christchurch Bay & Harbour is primarily comprised of residential communities, with tourism and recreation a large sector in the economy. There are five main communities which have developed from historic settlements: Bransgore, Christchurch, Highcliffe and Walkford, Milford-on-Sea and New Milton.

There are a wide variety of recreational facilities in the Strategy area, which are vital to improving the health and wellbeing of the community including access to the natural coastal environment through beaches and coastal waters, activities such as fishing and water sports, nature conservation sites and historical buildings.

These communities, and the people and properties within them, are at risk of coastal flooding and erosion in the future. The Strategy will improve the resilience of the community to these risks, through improved coastal management. In some areas, this will involve new coastal defences and improved access to the coast and open space. In other areas of the coast, the management may involve adaptation to the changing coastline through relocation of some popular sites.

## 8.5 Scoping Outcome

The **Population and Communities theme has been scoped in to the SEA**, as there is potential for the Strategy to have significant impacts on the health and wellbeing of the communities within Christchurch Bay & Harbour.

## 8.6 SEA Objective

Table 8-3 presents the SEA objective and appraisal questions that will be used to assess the Strategy in relation to this theme.

**Table 8-3: SEA Framework of objectives and assessment questions: Population and Communities**

| SEA Objective | Supporting Questions (will the policy option help to…) |
|---|---|
| Protect and enhance the health and wellbeing of the community within the Strategy area. | • Protect and improve the resilience of communities?<br>• Improve and enhance the health and wellbeing of communities?<br>• Improve access to the coastal environment?<br>• Support the provision of more, better quality and accessible green infrastructure / open space?<br>• Avoid negative impacts to the quality and / or extent of existing recreational assets, including coastal footpaths? |

# 9. Transportation and Movement

This section focuses on transport infrastructure and usage across the Strategy area.

## 9.1 Policy Context

Table 9-1 presents the most relevant documents identified for population and communities.

**Table 9-1: Plans, policies and strategies reviewed in relation to transportation and movement**

| Policy | Year of publication | Weblink |
|---|---|---|
| **National Flood and Coastal Risk Management Strategy for England** | 2020 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920944/023_15482_Environment_agency_digitalAW_Strategy.pdf |
| **National Planning Policy Framework (NPPF)** | 2021 | https://www.gov.uk/government/publications/national-planning-policy-framework--2 |
| **South Inshore and South Offshore Marine Plan** | 2018 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726867/South_Marine_Plan_2018.pdf |
| **Marine and Coastal Access Act** | 2009 | https://www.legislation.gov.uk/ukpga/2009/23/contents |
| **The Department for Transport's Cycling and Walking Investment Strategy** | 2016 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/512895/cycling-and-walking-investment-strategy.pdf |
| **Decarbonising Transport: Setting the Challenge** | 2020 | https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/932122/decarbonising-transport-setting-the-challenge.pdf |
| **Bournemouth Local Plan** | 2012 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Bournemouth/Docs/Core-Strategy-1.pdf |
| **Christchurch and East Dorset Local Plan** | 2014 | https://www.bcpcouncil.gov.uk/Planning-and-building-control/Planning-policy/Current-Local-Plans/Christchurch/docs/christchurch-and-east-dorset-adopted-core-strategy.pdf |
| **New Forest District Council Local Plan 2016 - 2036** | 2020 | https://www.newforest.gov.uk/media/705/Local-Plan-Document-2016-2036/pdf/Local_Plan_2016-2036_Part_One_FINAL.pdf?m=637329191351130000 |
| **New Forest National Park Local Plan 2016 - 2036** | 2019 | https://www.newforestnpa.gov.uk/app/uploads/2019/09/Local-Plan-2016-2036-finalforweb.pdf |
| **Bournemouth, Poole and Dorset Local Transport Plan 2011 to 2026** | 2012 | https://www.dorsetcouncil.gov.uk/roads-highways-maintenance/documents/improvements-and-transport-planning/ltp3-bournemouth-poole-dorset-summary-document-final.pdf |
| **Hampshire Local Transport Plan 2011 - 2031** | 2013 | https://documents.hants.gov.uk/transport/HampshireLTPPartALongTermStrategy2011-2031RevisedApril2013.pdf |

The Strategy will be developed in accordance with the National FCERM Strategy, which highlights the importance of infrastructure resilience as part of climate resilient schemes. Infrastructure must be resilient to flooding and coastal erosion to avoid disruption to peoples' lives and livelihoods. This includes coastal access as part of the England Coast Path, to be developed as part of the Marine and Coastal Access Act 2009 by Natural England.

Any flood and coastal erosion management schemes that come forward and require planning permission will adhere to the NPPF, considering the impact of any coastal management measures on transport routes including walking, cycling and public transport. The effects of flooding and coastal erosion are likely to impact these transport routes, therefore the Strategy will look to enhance and protect them. Similarly, the Strategy should consider the objectives of the South Inshore and South Offshore Marine Plan (HM Government, 2018) to manage existing and aid the provision of new infrastructure supporting marine activities such as harbours and ferry services.

National transport strategies set out investment priorities, seeking to improve the connectivity and reliability of transport networks, whilst reducing transport impacts on the natural environment (including through decarbonisation and Nature Recovery Networks reconnecting species and habitats). There is more emphasis on choosing walking and cycling over other transport methods, and a focus on investment to encourage this. The Local Transport Plans identify the transport investment priorities and policies at a more localised scale, in line with the Local Plan policies.

# 9.2 Current Baseline

## 9.2.1 Road and Rail Links

The principal road networks through Christchurch Bay & Harbour are linked to the A35 from Bournemouth to Christchurch. The A337 continues along the coast to Lymington, with the B3058 branching off to Milford-on-Sea. A network of smaller roads run close to the coast for much of the area, particularly at Barton-on-Sea where the road runs parallel to the cliff top. There are approximately thirteen coastal carparks across Christchurch Bay.

Within the Strategy area, there are three train stations serviced by South Western Railway: Hinton Admiral, New Milton and Christchurch. The trains operate between London, Southampton and Weymouth.

## 9.2.2 Harbour and Ferry Services

Christchurch Harbour provides access to the Solent and Poole Harbour, popular areas for boating on the south coast. The entrance to the harbour is at the downstream end of Mudeford Quay, known as 'The Run'. Vessels are permitted to come along side Mudeford Quay within The Run, including commercial fishing vessels and ferries. There are multiple slipways into the harbour, including at Avon Bridge, Christchurch Sailing Club and a public landing area at Christchurch Quay. There are also several moorings and boat yards within the harbour, including trot moorings to the south east of the harbour and self-laid moorings at Mudeford,

A car and passenger ferry is operated between Yarmouth, Isle of Wight, and Lymington, located to the east of the Strategy area. Seasonal passenger ferries operate between Keyhaven and Yarmouth, and Keyhaven to Hurst Castle. Within Christchurch Harbour, passenger ferries operate from Mudeford Quay to Mudeford Sandbank, and between Tuckton Tea Gardens, Mudeford Sandbank, Wick Ferry and Christchurch Quay. Major ports are located immediately to the east and west of Christchurch Bay in Southampton and Poole.

## 9.2.3 Public Rights of Way

There are a significant number of public footpaths[19] across the Strategy area, including those along the beach front at Mudeford, Highcliffe and Milford-on-Sea. Solent Way (the E9 European Long-Distance Path) runs along the clifftops around Christchurch Bay, starting from Milford-on-Sea. Natural England are currently in the process of developing the England Coast Path[20], opening it in sections. Solent Way will form part of this coastal path once the proposals have been approved. Solent Way is currently at risk of coastal erosion in the present day; therefore the path position needs to be managed in the future.

[19] Rights of Way maps [online] Available at: https://www.rowmaps.com/ [Accessed 17 June 2021]
[20] The England Coast Path [online] Available at: https://www.nationaltrail.co.uk/en_GB/trails/england-coast-path/ [Accessed 26 October 2021]

### 9.2.4 Cycleways

In the BCP area, a cycle route map[21] has been produced to encourage more cycling with the use of the Beryl bike hire company. The map shows a network of routes recommended by cyclists and highlights the locations of the preferred parking areas for the Beryl bike scheme. The council is continuing to invest in facilities for cyclists, with many principal roads featuring cycle lanes.

Similarly in the NFDC area, a cycle route map has been produced[22]. It brings together all managed routes within the New Forest National Park and surrounding area, including Milford-on-Sea and New Milton. At cycle hire shops, cyclists can hire Garmin satellite navigation systems to guide them.

## 9.3 Future Baseline

Coastal flooding and erosion has the potential to impact the key land-based travel infrastructure in the future, restricting transport and movement both within and surrounding the Strategy area. Predominantly small roads run along the coast, and flooding or coastal erosion of these could cut off access to some properties and areas of the coastal environment. Similarly, public footpaths and cycleways which are close to the coastline will be at risk in the future. Climate change is likely to lead to more frequent extreme storm events, impacting the infrastructure associated with the harbour and ferry services.

Coastal management measures implemented by the Strategy could protect access to key transport infrastructure, limiting the impacts of flooding and erosion, through options which support new coastal defence measures. The Strategy could also support improvements to these transport networks, including more sustainable transport methods such as walking and cycling.

## 9.4 Key Issues

Within the Strategy area, there is a network of smaller roads which connect to the wider area. There are good public transport infrastructure links within and outside of the Strategy area, including trains, harbour and ferry services.

Public rights of way and cycleways also exist throughout Christchurch Bay and Harbour, with new cycle routes having recently been developed to support an increased uptake in cycling and sustainable transport methods.

Although there is a risk of coastal flooding and erosion to the transportation and movement within the Strategy area, the implementation of the Strategy could protect key infrastructure as well as enhancing the existing travel networks and promoting use of more sustainable travel methods.

## 9.5 Scoping Outcome

The **Transportation and Movement theme has been scoped in to the SEA**, as there is potential for the Strategy to have significant impacts on the transport infrastructure within Christchurch Bay & Harbour.

## 9.6 SEA Objective

Table 9-2 presents the SEA objective and appraisal questions that will be used to assess the Strategy in relation to this theme.

**Table 9-2: SEA Framework of objectives and assessment questions: Transportation and Movement**

| SEA Objective | Supporting Questions (will the policy option help to…) |
|---|---|
| Protect and enhance transport infrastructure in the Strategy area. | • Protect and improve the resilience of key transport infrastructure?<br>• Extend or improve active travel networks?<br>• Enable sustainable transport infrastructure improvements? |

[21] BCP Council (2019) Bournemouth, Christchurch and Poole Cycle Map [online] Available at: https://www.christchurch.gov.uk/sport-leisure/cycling/documents/bpc-area-cycle-map-christchurch.pdf [Accessed 17 June 2021
[22] New Forest National Park Authority (2018) New Forest Cycle Trails [online] Available at: https://www.newforestnpa.gov.uk/app/uploads/2018/01/New-Forest-Cycle-Routes-Map.pdf [Accessed 17 June 2021]

# 10. Next Steps

## 10.1 Subsequent stages for the SEA process

Scoping is the first stage in a five-stage SEA process. The following steps are outlined below:

1. Scoping;
2. Develop and assess reasonable alternatives, with a view to informing preparation of the draft plan, and subsequent assessment of the draft plan;
3. Preparation of the Environmental Report with a view to informing consultation;
4. Consultation on the Environmental Report; and,
5. Publication of a statement at the time of plan adoption which 'tells the story' of plan-making and SEA.

Accordingly, the next stage after scoping will therefore involve the development and assessment of reasonable alternatives for the Strategy. The findings of this work will be fed back to BCP Council and NFDC so that they can be taken into consideration when finalising the draft Strategy. The draft Strategy will then be subject to assessment, and the Environmental Report will be published for consultation alongside it.

## 10.2 Consultation

Public involvement through consultation is a key element of the SEA process. At this scoping stage, the SEA Regulations require consultation with statutory consultees the Environment Agency (EA), Historic England (HE) and Natural England (NE).

The Scoping Report was released to these statutory consultees for comment between August and October 2021, with particular focus on the evidence base for the SEA, the identified key issues and the proposed SEA framework.

All comments received on the Scoping Report have been reviewed and will influence the development of the SEA where appropriate.

# Appendix A Proposed SEA Framework

The proposed SEA objectives and assessment questions for each of the themes explored in this report have been pulled together, presenting the proposed SEA Framework. For the purposes of this SEA, it is proposed that Air Quality is scoped out of the proposed framework.

| SEA Theme | SEA Objective | Supporting Questions (will the policy option help to…) |
|---|---|---|
| **Biodiversity and Geodiversity** | To protect and enhance biodiversity and geodiversity habitats and species; achieving biodiversity net gain and improved habitat connectivity within the Strategy area. | • Protect and enhance European, nationally and locally designated sites, including species that are important to the integrity of these sites and recognised as priority species?<br>• Protect, enhance and improve connectivity of habitats?<br>• Support the delivery of biodiversity net gain?<br>• Support habitat creation, restoration and recovery in the coastal zone?<br>• Increase the resilience of biodiversity in the Strategy area to the effects of climate change through increased coastal flooding and erosion? |
| **Climate Change** | To support the resilience of the Strategy area to the potential effects of climate change, including coastal flooding and erosion. | • Contribute to adapting to climate change?<br>• Contribute to mitigating the main causes of climate change by promoting low or zero carbon approaches? |
| **Landscape** | To protect and enhance the character and quality of the Strategy area landscape and seascape. | • Conserve and enhance the quality of landscape / seascape for people, places and nature?<br>• Contribute to better management of landscape / seascape assets?<br>• Conserve and enhance features of local importance?<br>• Improve linkages to the coastline?<br>• Protect visual amenity? |
| **Historic Environment** | To protect, conserve and enhance the historic environment within the Strategy area. | • Conserve and enhance heritage assets and their settings?<br>• Conserve and enhance the special interest, character and appearance of locally important features and their settings?<br>• Consider the contribution of historic places to the character of the coastal environment?<br>• Support access to the historic environment? |
| **Land, Soil and Water Resources** | To ensure the efficient and effective use of land in the Strategy area. | • Protect and conserve soils and improve resilience to degradation?<br>• Protect and conserve the best and most productive agricultural land?<br>• Prevent contamination from historic landfill sites and support remediation? |
| | To protect and enhance water quality, and manage water resources within the Strategy area in a sustainable manner. | • Help secure compliance with the Water Framework Directive and contribute to enhancing the status of water bodies?<br>• Contribute to the sustainable management of water resources and fisheries? |
| **Population and Communities** | Protect and enhance the health and wellbeing of the community within the Strategy area. | • Protect and improve the resilience of communities?<br>• Improve and enhance the health and wellbeing of communities?<br>• Improve access to the coastal environment?<br>• Support the provision of more, better quality and accessible green infrastructure / open space?<br>• Avoid negative impacts to the quality and / or extent of existing recreational assets, including coastal footpaths? |

| SEA Theme | SEA Objective | Supporting Questions (will the policy option help to…) |
|---|---|---|
| **Transport and Movement** | Protect and enhance transport infrastructure in the Strategy area. | • Protect and improve the resilience of key transport infrastructure?<br>• Extend or improve active travel networks?<br>• Enable sustainable transport infrastructure improvements? |