

# Aberdeenshire Coastal Change Adaptation Plan

**Gourdon & Inverbervie**

**Draft**

**June 2026**

**Prepared for:  
Aberdeenshire Council**

**Aberdeenshire**  
COUNCIL



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This report describes work commissioned by Andrew Gemmell, on behalf of Aberdeenshire Council. The Client's representative for the contract was Lee Watson of Aberdeenshire Council. George Paterson, Rowan Callaghan-Creighton and Doug Pender of JBA Consulting carried out this work.

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# Executive Summary

The report documents the Coastal Change Adaptation Plan (CCAP) for the Gourdon and Inverbervie Community Area (CA) in Aberdeenshire.

The CCAP provides an overview of the coastal flood and erosion risks to Gourdon and Inverbervie, which are used to underpin development of possible Adaptation Pathways for this community. These are presented, along with a framework to support proactive coastal risk management, enable implementation of climate change adaptation actions and link with climate resilient development planning along Aberdeenshire's coast.

The Plan has been developed using available, datasets from Aberdeenshire Council, SEPA and the Dynamic Coast (DC) Project. It aims to directly support statutory and non-statutory Aberdeenshire Council policies, plans and strategies and aligns with key coastal climate change adaptation guidance and resources within and beyond Aberdeenshire Council.

This Plan documents the Phase 0 starting point of adaptation, meaning that no definitive preferred Adaptation Pathway and associated Action Plan have been developed. Rather this Plan sets out a framework and process for Aberdeenshire Council to implement to effectively plan and support sustainable adaptation.

To develop Adaptation Pathways, the coast of the CA was classified into Coastal Management Units (CMUs) defined by:

- Classification of coastal landform type.
- Risk associated with coastal flooding and erosion.
- A total of six CMUs were identified, and five associated Adaptation Pathways.

To support delivery, an economic impact assessment was undertaken. This, in conjunction with the risk assessment, was used to establish initial outcome policies for each CMU.

These are set as either:

1. No intervention
2. Enhance natural features
3. Protect
4. Create Space

Delivery of these outcome policies is described by an Implementation Plan by defining Triggers and setting associated Actions against these. A single Implementation Plan is applied to the entire CA, where the outcome of the process determines what direction will be followed within the Adaptation Pathway. The Implementation Plan has three key stages:

1. Monitoring and Triggers
2. Actions
3. Outcomes

Trigger points are identified, and set following a risk-based approach and will be identified through repeat monitoring of available data that informs coastal flood and erosion risk.

Realisation of Triggers signal a need for review or change of the Adaptation Pathway. Actions bridge the gap between Triggers and Outcomes and define what processes need to be implemented before actions that deliver the desired policy Outcomes can be set.

A set of Phase 0 Actions have been identified, that require immediate attention because of Triggers being met in this iteration of the Gourdon and Inverbervie Local Plan. Furthermore, this initial stage of the adaptation planning process has identified several knowledge gaps and opportunities for activities to be undertaken upfront to support coastal change adaptation at Gourdon and Inverbervie.

The current iteration of the Aberdeenshire CA local plan is at Phase 0. The Triggers met in Phase 0 of the Adaptation Pathway and associated Actions for each CMU are summarised.

Table 0: Phase 0 Triggers and Actions for each CMU in Gourdon and Inverbervie.

| CMU | Trigger                         | Action                                         |
|-----|---------------------------------|------------------------------------------------|
| 2   | Flooding Trigger met (Level 2)  | Undertake assessment and plan for intervention |
| 3   | Condition Trigger met (Level 1) | Increase monitoring and plan for assessment    |
| 5   | Flooding Trigger met (Level 2)  | Undertake assessment and plan for intervention |
| 5   | Condition Trigger met (Level 2) | Undertake assessment and plan for intervention |
| 6   | Flooding Trigger met (Level 2)  | Undertake assessment and plan for intervention |

As well as Triggers and Actions that correspond directly to the Adaptation Pathway and specified CMUs, Proactive Actions, which should be ongoing to support coastal change adaptation for the whole of Gourdon and Inverbervie are summarised below:

1. Review shingle recycling plan and investigate opportunities for shingle beach enhancement.
2. Investigate opportunities for Inverbervie Caravan Park and Beach Front car park re-location.
3. Investigate opportunities for re-alignment of core path south of Inverbervie.
4. Establish coordinated and consistent beach monitoring plan for Natural section of coast between Gourdon and Inverbervie.
5. Adaptation and resilience workshop with local community and stakeholders.
6. Identify landownership and safeguarding.
7. Undertake critical third party sector engagement to quantify wider economic impacts.
8. Integrate future erosion projections into Local Development Planning to establish Coastal Change Management Areas.

# 1 Introduction

## 1.1 Coastal Change Adaptation Planning in Aberdeenshire

Our climate is changing and throughout history, the coast has responded to changes in sea level, storms, and other climate drivers. This means that the current position of Aberdeenshire's coast is not fixed, but dynamic, and will continue to evolve as our climate changes.

In a changing climate, traditional coastal risk management approaches will become a less sustainable means of managing and protecting communities against these risks. Rather, we need to become more resilient and adapt to our changing coast through combined coastal risk management with climate resilient development planning on land near the coast. To enable this, we must be proactive in making combined coastal risk and land management decisions which provide long-term space for the coast to naturally respond to coastal climate change risks.

Developing and implementing an Adaptive Framework now to address how we respond to the current and future risks can help to reduce costs and negative impacts such as assets eroding into the sea or suffering repeat frequent flooding. More positively, a proactive approach to adaptation and climate resilient development planning now can generate wider benefits and opportunities for coastal communities and the ecosystems which sustain and support them.

The Coastal Change Adaptation Plans (CCAPs) provide a key first step in this process; they are a practical mechanism to enable proactive engagement with and involvement of communities to co-develop a shared vision for long-term societal resilience to coastal climate change risk and impacts.

To support this adaptation journey in Aberdeenshire, the coast has been subdivided into Community Areas (CAs) (Figure 1-1). Gourdon and Inverbervie is one of the CAs identified as being a priority for a CCAP. The coast of the Gourdon and Inverbervie is a mixture of shingle, natural coast, defended coast with sea walls and rock armour defences and Gourdon harbour. This provides primary motivations for a more detailed, local, CCAP which is contained in this document.



Figure 1-1: Extent and location of CAs within Aberdeenshire.

## 1.2 What is a Local CCAP?

A Local CCAP follows the same principle as the Regional CCAP<sup>1</sup> but is assessed and developed at a finer level of detail for a specified CA. A local CCAP is developed where a CA has been identified as a high priority, based on risk, development, management and socio-economic Indicators (see Regional Plan for more details). It divides the coast of the CA into individual Coastal Management Units (CMUs) and presents Adaptation Pathways for each. See section 2.2 for more details on CMUs and CMU classification.

<sup>1</sup> Aberdeenshire Coastal Change Adaption Plan - Regional Plan

### 1.3 What are adaptation pathways?

Adaptation Pathways offer flexible tools for local authorities, politicians, businesses, and residents to make informed decisions about coastal change and uncertainty. Beyond traditional management, these pathways highlight the value of working with natural processes, enhancing the environment, and implementing supportive steps like land safeguarding to prepare for rising sea levels, erosion, and flooding.

Their goal is to identify climate-resilient risk management and development options for each CMU, allowing decisions to be adjusted dynamically over time. Triggers within Adaptation Pathways indicate when current approaches should be reviewed and possibly changed based on new information or shifting risks.

### 1.4 What is the focus of the Local CCAP?

Adapting to coastal and climate change requires two parallel streams:

1. Land-based initiatives to prevent new future risk.
2. Management initiatives to reduce current and future risk.

The Local CCAP presented here focuses only the management initiatives but, only by considering these in parallel with those land-based will result in a sustainable adaptation journey for Aberdeenshire. This should identify both the need and practical steps required to safeguard land to support where areas of retreat may be considered in the future.

### 1.5 Where are we on the adaptation journey?

The aim of this first CCAP is to consolidate our understanding of the physical risks and how these interact with communities and their assets to identify the present day and future hazards of our changing coast for Gourdon and Inverbervie. It then identifies and promotes a process that, when implemented by Aberdeenshire Council, will support community adaptation to coastal change.

The adaptation journey is a multiphase, multiyear process and aims to transition communities into a more sustainable and resilient future. We are currently at Phase 0, meaning that no definitive preferred Adaptation Pathway and associated Action Plan have been developed. Rather initial and end outcome policies are defined. Through the process these will be implemented through identified actions for delivery.

## 1.6 What is the Phase 0 Adaptation Framework?

The overall aim of the Adaptation Framework set out in this Local CCAPs is to:

***Guide Aberdeenshire Council towards development of detailed Adaptation Pathways and associated Action Plans for the Gourdon and Inverbervie CA.***

To achieve this goal the following objectives have been set for Phase 0:

- Identify and characterise local CMUs within the CA suitable for development future Adaptation Pathways.
- Present coastal flood and erosion risk for each CMU.
- Identify CA and CMU specific Triggers that will influence adaptation decision making.
- Develop an Implementation Plan to be used by Aberdeenshire Council to support adaptive decision making, future action planning and evaluation of adaptation options.
- Identify and set Proactive Actions that will support delivery of the CCAP in each CMU.
- Inform and support the Local Development Plan<sup>2</sup> and Local Planning Policy. These should be implemented in parallel to avoid future risk by making space for change.

## 1.7 How has this framework been developed?

The approach to coastal change adaptation in Aberdeenshire is presented in the Regional Plan which distils the Scottish Government guidance<sup>3</sup> into four key pillars of adaptation (Figure 1-2). Development and application of the CCAP Implementation Plan should align with these principles.

<sup>2</sup> [Aberdeenshire Council Local Development Plan 2023](#)

<sup>3</sup> [Coastal Change Adaption Plan Guidance - Scottish Government](#)

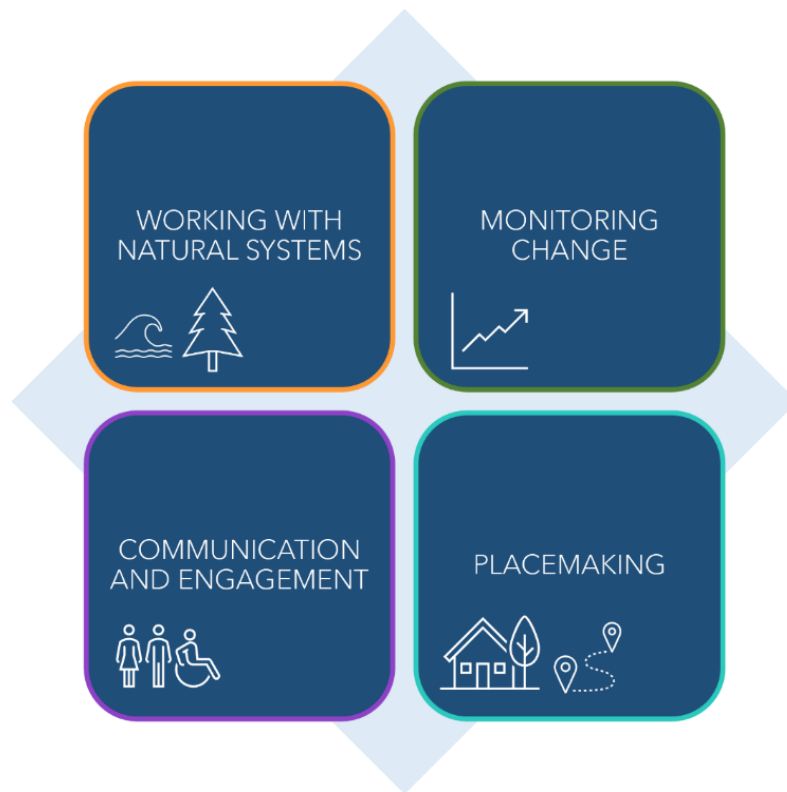


Figure 1-2: Four pillars of coastal adaptation for Aberdeenshire.

### 1.8 How does the Local CCAP link to the Regional CCAP?

The Regional CCAP links to the Local CCAP by:

1. Defining the prioritisation of Local CCAP with risk, development, management, and socio-economic Influence Factors (see Regional Plan for more details).
2. Setting wide Proactive Actions that, when implemented, should be used to support Local CCAP Action Plans.
3. Providing the links between the land-based components of the Adaptation Planning process. This includes links with the LDP and delivery of necessary regional actions required to effectively support and plan for adaptation at a local level e.g. land safeguarding.

## 2 Plan Overview

### 2.1 Plan Area and Characteristics

The Gourdon and Inverbervie CA covers an area of approximately 10 km<sup>2</sup> and is located between Catterline, Kinneff and Dunnottar CA and Benholm and Johnshaven CA. The CA includes a range of coastal environments and land use areas (Figure 2-1).

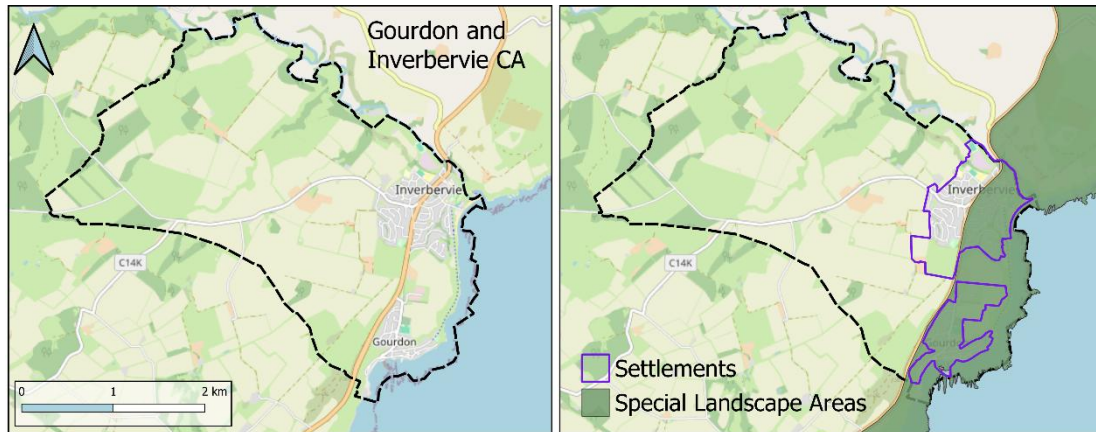


Figure 2-1: Gourdon and Inverbervie CA, showing settlements and coastal characteristics.

## Settlements:

The Gourdon and Inverbervie CA includes the coastal settlements of Inverbervie to the north and Gourdon to the south. Inverbervie has the largest population with 2,300 and 1,030 households<sup>4</sup>. The Aberdeenshire Council Local Development Plan (LDP) designates specific areas for land use within settlements and rural communities.

## Greenspace and Environment:

The coast of the Gourdon and Inverbervie CA forms part of the South East Aberdeenshire Coast Special Landscape Area (SLA). The Gourdon to Inverbervie Coastal Path passes through this SLA and connects the two settlements providing valuable recreational and tourist amenity for the communities and surrounding area.

## Habitats:

The Landscape Character Type of the Gourdon and Inverbervie CA as classified by Nature Scot, is Raised Beach Coast - Aberdeenshire. Cliffs along the stretch are primarily of soft red sandstone behind pebble and shingle beach habitat. Nature Scot's Habitat Map of Scotland has little classification for the coastal area but inland is dominated by Arable Land and Market Gardens. DC identifies the coastal type of the settlements of Gourdon and Inverbervie as Erodible and Artificial Defences, with the coastline between as Erodible and no Artificial Defences.

## 2.2 Coastal Management Units

To facilitate the development of this Local CCAP, the coast of the CA is classified into Coastal Management Units (CMUs) defined by:

1. Classification of coast type.
  - Natural – beaches, cliffs, dunes, saltmarshes, etc.
  - Defended – formal engineered structures.
  - Hybrid – combination of Natural and Defended
2. Risk associated with coastal flooding and erosion.
  - Risk and Hazard  
Assets present in CMU, which are at risk of flooding/erosion hazard.
  - Risk and Unknown Hazard  
Assets present in CMU, no data on flood/erosion risk available.
  - No Risk and Hazard  
No assets present in CMU, but there is still a flooding/erosion hazard.
  - No Risk and No Hazard  
No assets present in CMU, no flooding/erosion hazard.

---

<sup>4</sup> Aberdeenshire Council - Population Statistics

Following this, the Gourdon and Inverbervie CA coast has been subdivided into six CMUs (Figure 2-2). These are described below including a summary of the coastal change and flood risk.

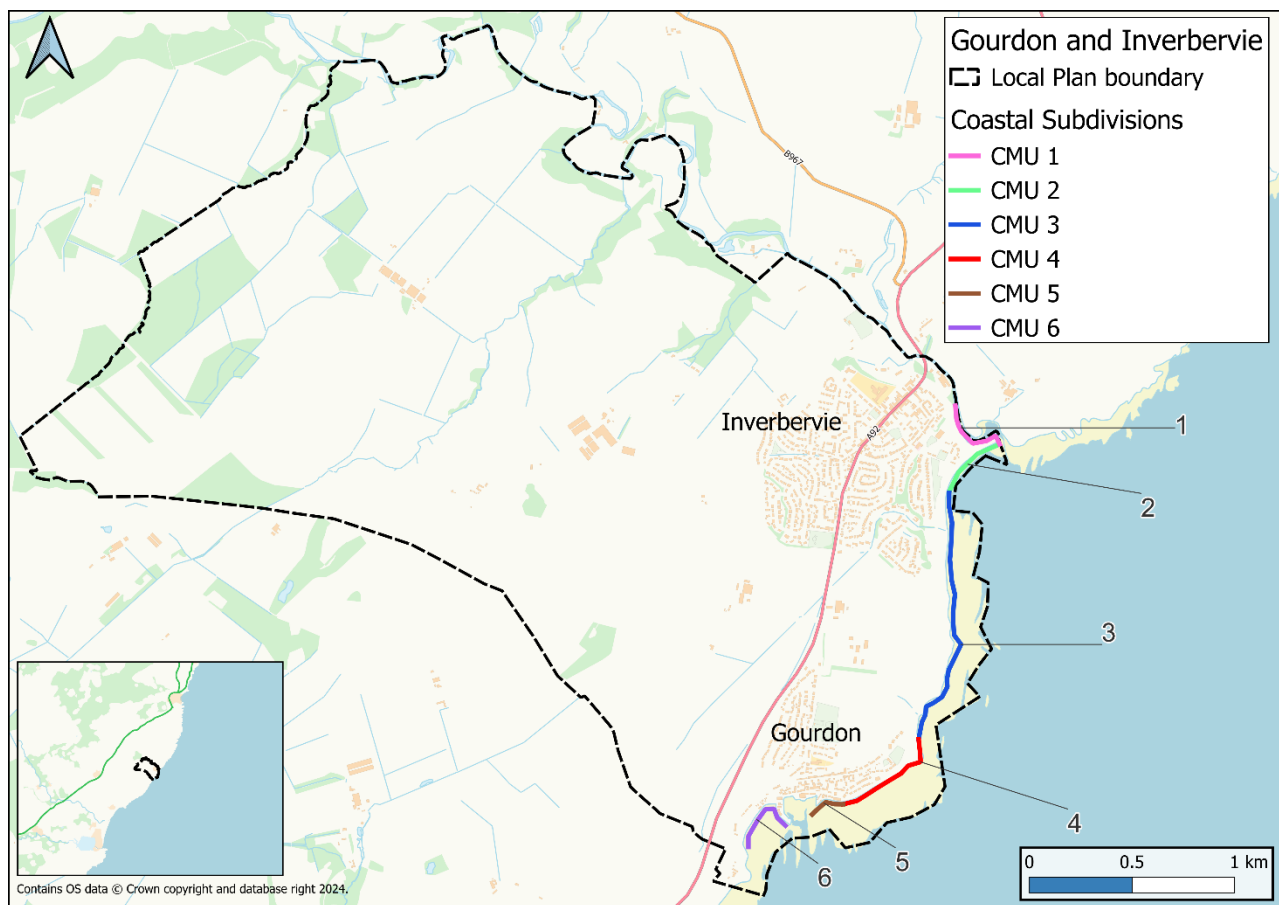


Figure 2-2: CMUs within the Gourdon and Inverbervie CA.

### 2.2.1 CMU 1: Bervie Water

CMU 1 covers the area predicted to be at risk from a 1 in 200-year future flood event via the Bervie Water river where it enters the sea at the northern end of Inverbervie. River bank erosion and coastal flooding affects the lower section of the Inverbervie Caravan Park (Figure 2-3 and Figure 2-4: CMU 1: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards.).



Figure 2-3: Inverbervie Caravan Park boundary and Bervie Water right bank erosion.

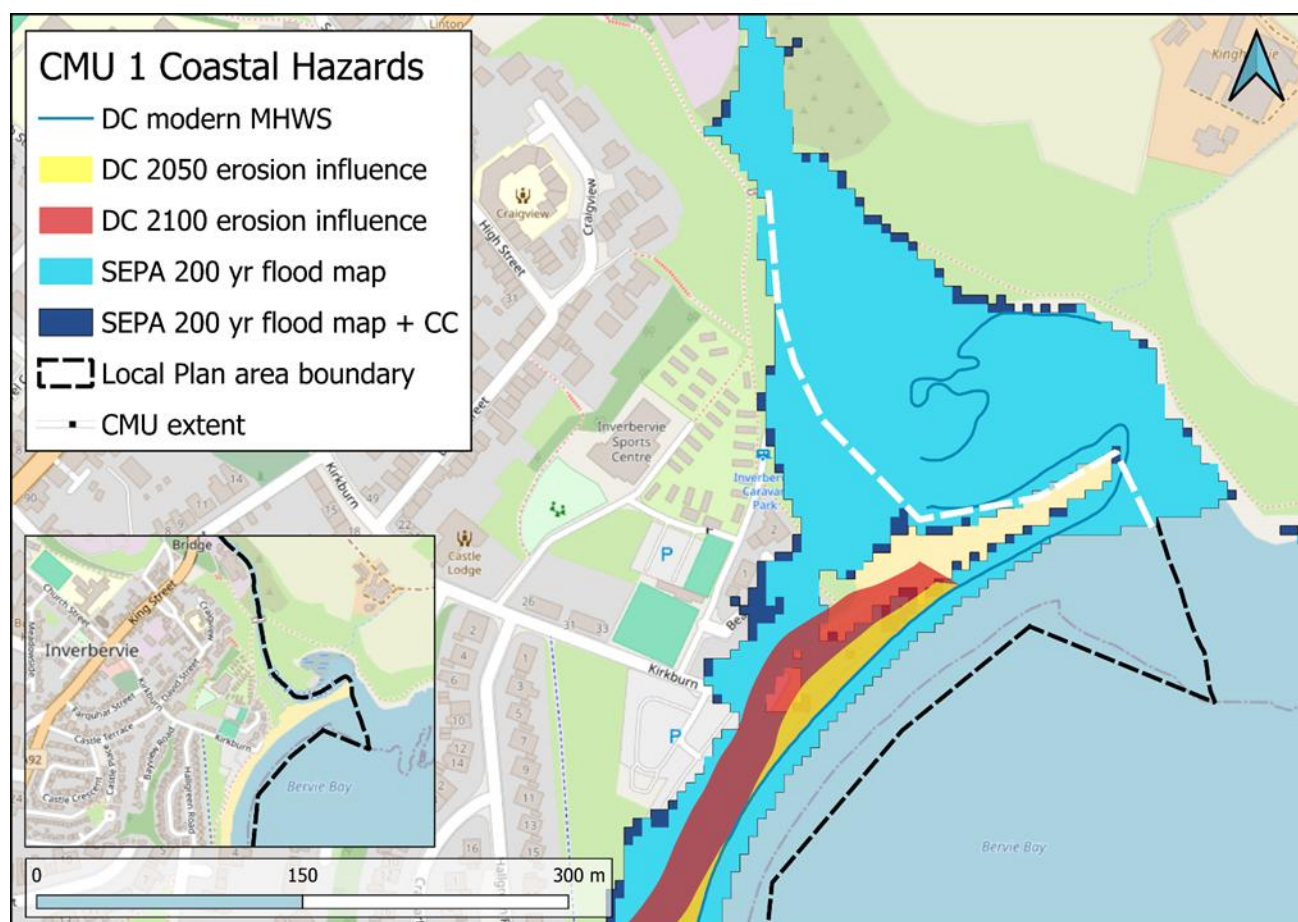


Figure 2-4: CMU 1: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards.

### 2.2.2 CMU 2: Inverbervie - Bervie Bay

CMU 2 is a natural shingle and rock section of the coast with a variety of piecemeal coastal protection structures throughout the length of Bervie Bay (Appendix A). Available information shows there is currently risk predicted from coastal erosion by 2100 in this unit

to a coastal property at the north of the town. This property and three neighbouring properties are also at risk from a 1 in 10-year coastal flood. The current protection at this location is 40m of rock armour and a 65m shingle revetment (See Appendix A.2).

The defences in this CMU are largely effective, but show signs of aging and damage, particularly the shingle revetment baskets. The rock armour in front of the property at risk from coastal erosion is general in good visual condition, although the design and construction approach is unknown. The Inverbervie Beach Front car park relies on the condition of these structures and the state of the beach and is show to be at risk from overtopping (Figure 2-5).

This CMU sits within the South East Aberdeenshire Coast Special Landscape Area. DC data shows that historically, this CMU has eroded at a relatively slow maximum rate of 0.1 m/yr. This however is potentially supported by the shingle recycling and management works undertaken. Predicted land loss caused by shoreline retreat may reach a maximum of 38 m by 2100 (Table 2-1).

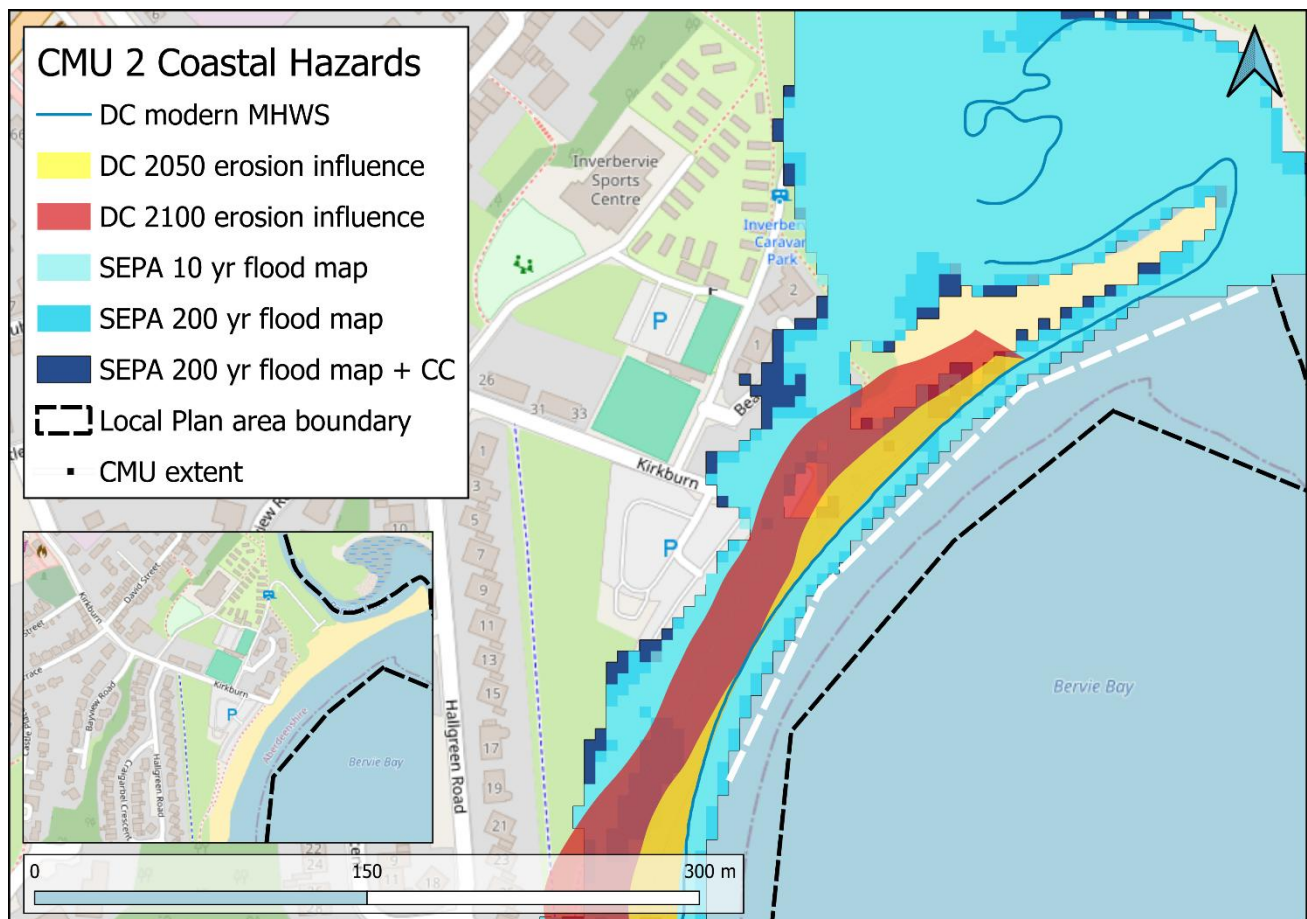


Figure 2-5: CMU 2: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards.

Table 2-1: CMU 2 DC erosion summary.

| Dynamic Coast calculation | Results               |         |
|---------------------------|-----------------------|---------|
| Historical rate           | 0.1 m/yr              | Maximum |
|                           | +0.1 m/yr (accretion) | Median  |
| 2050 rate                 | 0.4 m/yr              | Maximum |
|                           | 0.1 m/yr              | Median  |
| 2050 distance             | 7.7 m                 | Maximum |
|                           | 1.4 m                 | Median  |
| 2100 rate                 | 0.7 m/yr              | Maximum |
|                           | 0.5 m/yr              | Median  |
| 2100 distance             | 38.1 m                | Maximum |
|                           | 21.8 m                | Median  |

### 2.2.3 CMU 3: Coastal Path

Like CMU 2, CMU 3 is a natural shingle and rock section of the coast. The CMU leads away from the settlement of Inverbervie to the edge of Gourdon in the south. The main asset at risk is the core path south of the beachfront car park where, in various places, is at risk from erosion by 2050 and 2100. No properties or key roads are at predicted to be at risk from erosion or flooding in this unit.

Artificial protection at the northern end is provided by rock armour, a short section of wall, and a shingle revetment (Figure 8-4). The rock armour defence at this location is however in poor condition (Appendix A.2). To the south of the settlement, the shingle beach acts as the only defence and longer stretches of core path are at risk here. Nature Based Solution opportunities to protect the core path are given in Section 5.

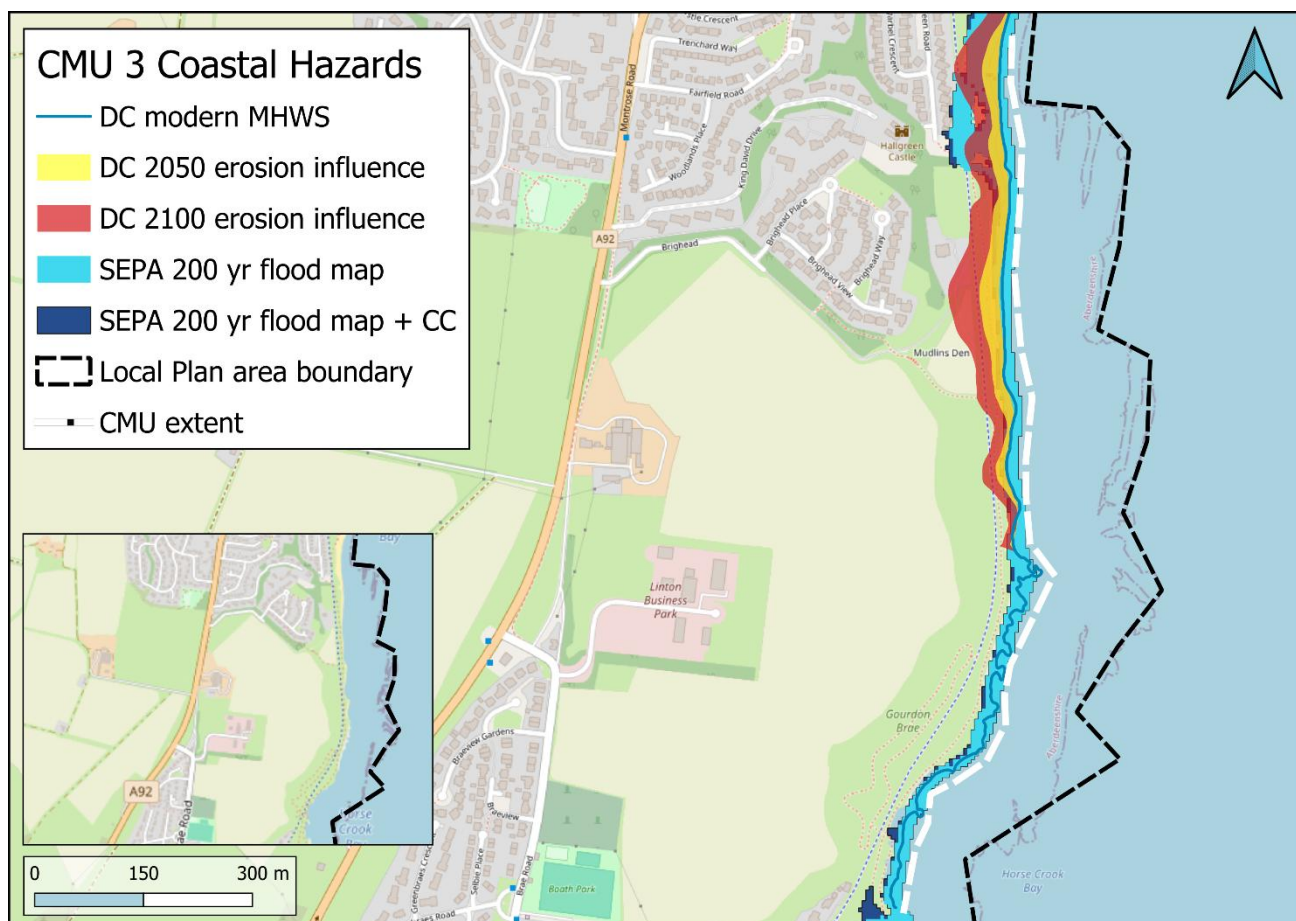


Figure 2-6: CMU 3: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards.

DC data shows that this section of coast has eroded historically at a maximum rate of 0.5 m/yr, higher than neighbouring CMU 2. Predicted land loss to erosion by 2100 is approximately 70m, nearly double that of CMU 2.

Table 2-2: CMU 3 DC erosion summary.

| Dynamic Coast calculation | Results               |         |
|---------------------------|-----------------------|---------|
| Historical rate           | 0.5 m/yr              | Maximum |
|                           | +0.1 m/yr (accretion) | Median  |
| 2050 rate                 | 0.8 m/yr              | Maximum |
|                           | 0.3 m/yr              | Median  |
| 2050 distance             | 20 m                  | Maximum |
|                           | 7.6 m                 | Median  |
| 2100 rate                 | 1.1 m/yr              | Maximum |
|                           | 0.6 m/yr              | Median  |
| 2100 distance             | 70.4 m                | Maximum |
|                           | 34.9 m                | Median  |

#### 2.2.4 CMU 4: Gourdon - East beach/car park

CMU 4 is a natural section of coast at the eastern end of the settlement of Gourdon. Approximately 10 m from the coastline properties are protected from erosion and flooding by privately owned residential garden walls. A small car park at the eastern end of Seaview Terrace provides access to the Inverbervie to Gourdon core coastal path and to a children's play park. The car park floods due to overtopping and is at risk from 1 in 200-year coastal flood event. Although small, it is an important resource for the local community and tourism, therefore consideration should be given to future re-location by making space (See Section 6).

Available information from SEPA shows six residential and three non-residential properties are predicted to be at risk from coastal flooding in this unit under a 1 in 200-year coastal flood event (Figure 2-7: CMU 4: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards. DC data shows that historically, this section of coast has not eroded and typically experienced accretion at 0.2 m/yr. However, predicted land loss caused by shoreline retreat may reach a maximum of 28 m by 2100 putting two residential properties at risk (Table 2-3).

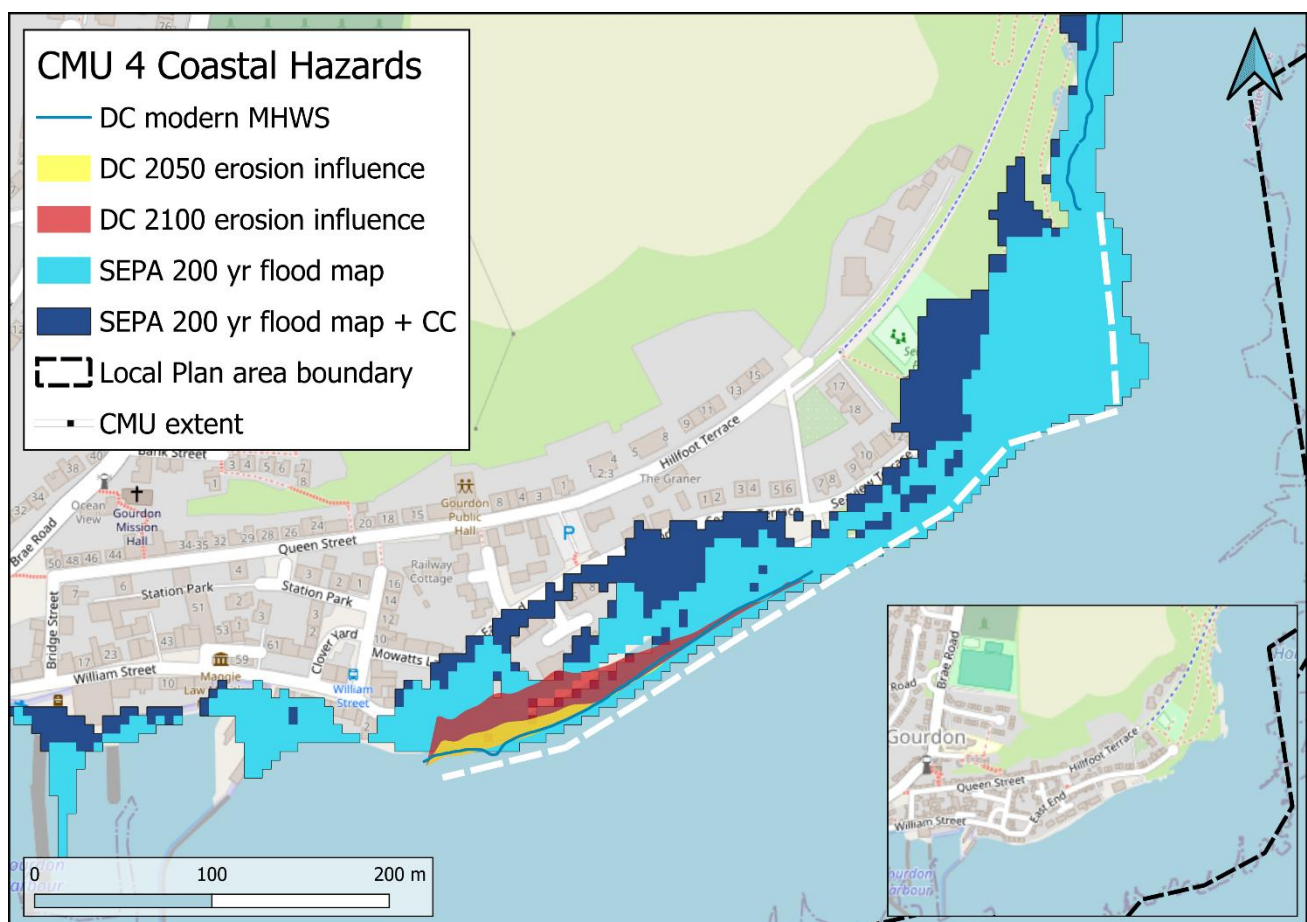


Figure 2-7: CMU 4: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards.

Table 2-3: CMU 4 DC erosion summary.

| Dynamic Coast calculation | Results               |         |
|---------------------------|-----------------------|---------|
| Historical rate           | 0 m/yr                | Maximum |
|                           | +0.2 m/yr (accretion) | Median  |
| 2050 rate                 | 0.2 m/yr              | Maximum |
|                           | 0 m/yr                | Median  |
| 2050 distance             | 4.9 m                 | Maximum |
|                           | +2.8 m (accretion)    | Median  |
| 2100 rate                 | 0.6 m/yr              | Maximum |
|                           | 0.3 m/yr              | Median  |
| 2100 distance             | 28.1 m                | Maximum |
|                           | 5.7 m                 | Median  |

### 2.2.5 CMU 5: Gourdon - East of harbour

CMU 5 is a defended section of coast, with a harbour wall joined to a vertical stone and concrete wall which extends to the north east along a rocky shore where it meets shingle beach habitat. The wall is in extremely poor condition in front of a row of flats where large parts are missing, exposing the residential properties' outer walls. The ownership of the structures in this CMU is not clear at this stage and will need to be understood to develop an effect pathway.

Available information from SEPA flood extents show nine residential and one non-residential properties are predicted to be at risk from coastal flooding in this unit under a 1 in 200-year flood event (Figure 2-8). DC data shows that historically, this section of coast has not eroded.

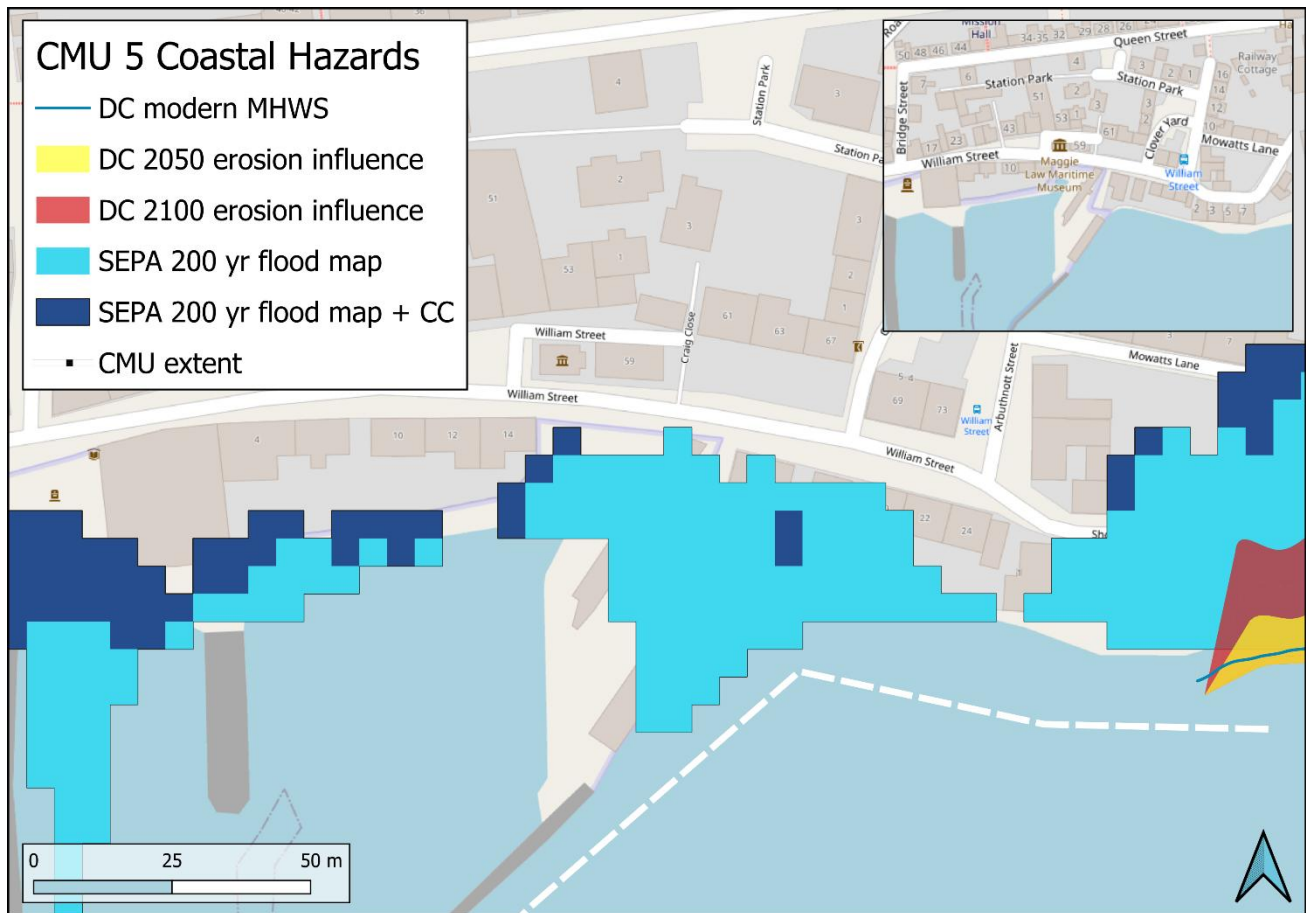


Figure 2-8: CMU 5: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards.

#### 2.2.6 CMU 6: Gourdon - West of harbour

CMU 6 is an artificial stretch of coastline to the west of Gourdon Harbour. The main feature is a sandstone and concrete wall behind a shingle beach. Rock armour protects the stone wall and a section of exposed land to the north of the CMU, but there is no protection in front of the wall farther west. The wall is damaged in places and will require maintenance in the near future if it is to remain effective and reduce overtopping and erosion risk (Appendix A).

No DC data exists on historical or predicted erosion within this CMU. No residential and seven non-residential properties are at risk from coastal flooding in this unit under a 1 in 200-year event (Figure 2-9: CMU 6: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards).

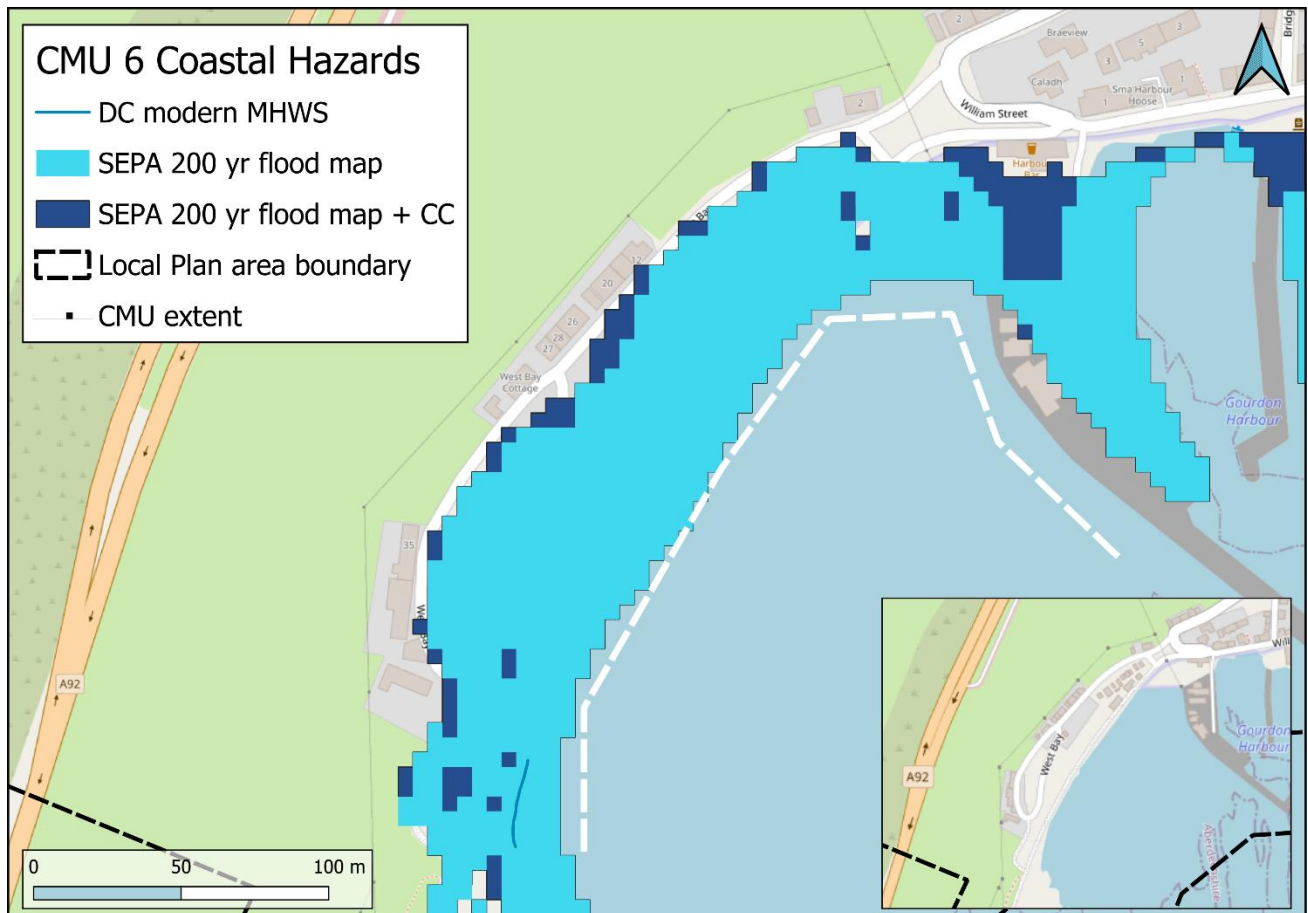


Figure 2-9: CMU 6: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards.

## 3 Coastal Defences and Asset Condition

### 3.1 Role of Coastal Defence Condition in Triggering Management Actions

Across the coastline, the condition and ownership of coastal defences are critical in defining risk triggers and shaping management responsibilities within Coastal Management Units (CMUs). Aberdeenshire Council, in line with its Coast Protection Policy, adopts a non-intervention stance where defences do not directly safeguard Council-owned infrastructure, such as adopted roads. As is the case with the wall protecting a row of flats east of Gourdon Harbour, such structures are typically deemed privately owned unless ownership is formally contested. This policy has implications for how the policies and pathways have been developed in this Plan.

### 3.2 Assessing Asset Condition and Maintenance Regimes

To support risk-based decision-making, coastal defence assets are assessed using condition grade deterioration curves<sup>5</sup>. These allow practitioners to forecast asset performance and residual life by accounting for factors such as construction material, environmental exposure, and maintenance regimes. The deterioration grading system (CG1–CG5) facilitates prioritisation of inspections, targeted interventions, and strategic budget planning, thereby enabling more effective and informed coastal asset management. For further details on CMU-specific condition triggers and asset locations, refer to Section 8.2.5, and for the condition of the defences, Appendix A.

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<sup>5</sup> [SC060078 - Guidance Report](#)

## 4 Economic Impact Assessment

Delivery of adaptation actions relies on a clearly defined management policy for each CMU. Fundamental to this is Aberdeenshire Council's Coast Protection Policy<sup>6</sup>. Here the policy statement highlights, that provision of new coastal protection works will only be considered subject to a positive benefit cost ratio and securing appropriate contributions from beneficiaries. Neither of these conditions have been satisfied during Phase 0 so the Policies for each CMU will only be established to set the initial direction of travel, not outline how this will be achieved.

To support this, it is therefore critical to understand the potential damages that could be realised from coastal erosion, should nothing be done. We have undertaken a review of DC to evaluate economic damages.

### 4.1 Erosion damages assessment

An assessment has been undertaken to calculate damages to residential properties and non-residential properties at risk from coastal erosion in the CA. This is based on assets considered at risk or within the influence of areas at risk of coastal erosion contours as defined by the DC dataset.

Coastal erosion damages are based on the market value of buildings being written off in the year in which they are impacted by erosion. To determine present value damages, the value of the assets written off by erosion damage is discounted by the discount factor associated with the year of loss as set out in the Green Book (HM Treasury, 2022). Residential and non-residential property values are set out in sections 4.1.1 and 4.1.2 respectively.

#### 4.1.1 Residential property values

Residential property market values were obtained for each property type using 2023 annual house price statistics provided by Registers of Scotland for Aberdeenshire Council. Regional values are used to represent 'risk-free' valuations as specified by the Flood Hazard Research Centre. This information, broken down by property type, is shown in Table 4-1. Residential property types were determined by cross referencing the information in the DC receptors at risk dataset with the most up to date Multi-Coloured Handbook codes and property descriptions.

Table 4-1: Market value of residential properties by property type (2025).

| Property type | Market value (£) |
|---------------|------------------|
| Detached      | 330,708          |
| Semi-detached | 202,821          |
| Terraced      | 173,296          |

<sup>6</sup> Aberdeenshire Council (2024) Coast Protection Policy.

| Property type | Market value (£) |
|---------------|------------------|
| Flat          | 120,782          |

#### 4.1.2 Non-residential property values

Non-residential property market values were calculated using MCM guidance. Market values for non-residential properties were estimated from a property's rateable value per metre squared of floor space, as per Table 5.4 of the MCM. Rateable values for the northeast of England were used and are a suitable proxy for Scotland. Prime yield multipliers, informed by MCM Table 3.4, are given for certain categories of non-residential properties, and associated multipliers are calculated by dividing 100 by the prime yield percentage. Property areas are provided by the DC receptor at risk dataset.

A non-residential property market value per metre square can be calculated by multiplying the mean rateable value per m<sup>2</sup> by the prime yield multiplier, found in Table 4-2.

Table 4-2: Rateable value per m<sup>2</sup>, prime yield, and market value for non-residential properties

| NRP type | Mean rateable value per m <sup>2</sup> | Prime yield (%) | Multiplier (100/prime yield) | Market value per m <sup>2</sup> |
|----------|----------------------------------------|-----------------|------------------------------|---------------------------------|
| Other    | 58                                     | 6.0             | 16.7                         | £969                            |

#### 4.1.3 Erosion damage results

Erosion damages have been calculated for properties only as direct damages. Indirect property damages, intangible damages including increased vulnerability, and transport disruption have not been calculated.

For the CA these have been split into Inverbervie and Gourdon. Present-value erosion damages in each are presented in Table 4-3. All properties at risk are predicted to be impacted under the 2100 erosion outline.

Table 4-3: Receptor counts, and present-value damages associated with coastal erosion

| Area        | Receptor count | Present-value damages (£k) |
|-------------|----------------|----------------------------|
| Inverbervie | 4              | 113                        |
| Gourdon     | 2              | 62                         |

## 4.2 Flood damage assessment

### 4.2.1 Methodology

Flood damages are derived from properties from the 2017 SEPA coastal flood receptor data that lie within SEPA's coastal flood maps.

Annual Average Damage (AAD) values for residential and non-residential properties are recorded in SEPA's coastal flood receptor dataset. These AADs are based on direct residential and non-residential property damages, vehicle damages, intangible health

damages, indirect evacuation costs and indirect commercial damages. Property AADs are capped by their market value within the SEPA coastal receptor dataset for residential and non-residential properties. Capped AADs for each property at risk within the study area have been extracted to estimate coastal flood damages for properties in Fraserburgh.

The Office for National Statistics GDP deflator is used to update SEPA's 2017 receptor AAD values to 2024 values. The 2024 AAD values for properties impacted by coastal flooding are converted to a Present Value damage over the 100-year appraisal period using the standard Treasury discount factors.

AAD under climate change scenarios is not provided by SEPA, so a long term PVd that considers increased sea level rise over the appraisal period cannot be calculated without additional modelling.

#### 4.2.2 Results – flood damages

Table-4-4 presents the capped Annual Average Damage (AAD) and capped present-value damages (PVd) for each benefit zone in Gourdon and Inverbervie and for the entire study area combined. A total PVd of £588k is estimated for the full area based on a 100-year appraisal period. SEPA flood mapping extents indicate an additional two properties may also be at risk from coastal flooding (Figure 2-5: CMU 2: Coastal hazards map showing SEPA flooding extents and DC future erosion. Inset shows CMU without coastal hazards.

Table-4-4: Coastal flooding damage summary

|             | No. of properties at risk | AAD (£k) | PVd (£k) |
|-------------|---------------------------|----------|----------|
| Inverbervie | 2                         | 5        | 152      |
| Gourdon     | 15                        | 14       | 436      |
| All         | 17                        | 19       | 588      |

#### 4.2.3 Wider Economic Impact

##### Gourdon

While the assessment above has evaluated flood and erosion damage independently there is potential for a combined assessment of economic impact of coastal change on Gourdon to induce greater damages. This is particularly true for CMUs 5 and 6 where coastal protection structures are limiting the erosion risk and the flood depth from SEPA are likely underestimating the vulnerability of certain properties. This is particularly true for the properties on Shoretack Court and William Street.

As a sensitivity test the total write off value for all properties within the 1 in 200-year flood extent were estimated. The total value of this is approximately £2,585k, demonstrating there may be a stronger economic case for capital investment when a more comprehensive damage assessment was developed.

Restaurants, bars and other local businesses located around Gourdon Harbour, including the Gourline fish merchants, are at risk of damage and disruption due to coastal flooding. While Gourdon Harbour itself has limited commercial significance at the regional scale, it

supports several small trawlers and the Gatty Harbour is used by recreational vessels. Disruption to the harbour facilities could have a notable impact on the local economy, particularly on the service, recreational and tourism sectors. Flooding of local businesses may lead to temporary closures, reduced visitor footfall and loss of income. These effects, although localised, may be significant for a community where economic activity is closely tied to the coastal environment and small-scale maritime industries.

### **Inverbervie**

Although the extents of coastal erosion and flooding in Inverbervie cover a large stretch of coast, relatively few residential or commercial properties are predicted directly affected from the data available. Nevertheless, the potential for disruption to local infrastructure and amenities could have a wider economic impact on the town. Coastal flooding and erosion may reduce the accessibility and quality of local recreational assets, such as the Inverbervie Beach, resulting in a loss of amenity value for residents and visitors. The Inverbervie Caravan Park, located by Bervie Water, would face disruption, with consequences for the local tourism sector. A decline in visitor numbers due to damaged coastal infrastructure or beach closures following storm events may have knock-on effects for local businesses that rely on local tourism. Over time, repeated disruption or perceived risk could affect economic development opportunities in the area.

## 5 Nature Based Solutions

Working with natural processes forms one of the four key pillars of adaptation adopted in the Aberdeenshire CCAPs. Nature based solutions (NBS) in a coastal setting focus on the use and enhancement of natural systems to reduce the impacts of erosion and flooding while maintaining resilience to climate change. This could either be through "buying time" by slowing down erosion, or from enhancement through engineering to form part of the coastal defences.

### 5.1 NBS Opportunities

#### 5.1.1 CMU 2 and CMU 3

The shoreline of CMU 2 and CMU 3 is predicted to erode by the year 2050 (Figure 2-5 and Figure 2-6), so could benefit from the addition of shingle and where appropriate, shingle vegetation to help stabilise the coastline in front of the Inverbervie properties, car park and the Gourdon to Inverbervie core path. Aberdeenshire Council currently recycle shingle along the main front at Bervie Bay so this maintenance activity should continue. Additional shingle recycling should also be considered farther south in CMU 3 to help slow down erosion currently predicted to reach two sections of core path by 2050, and longer sections by 2100 (Figure 5-1).

There is currently no HABMOS classification for the shoreline in this area, so care should be taken to ensure any introduced vegetation is in keeping with the natural environment.

### 5.2 NBS Prioritisation

Within the Gourdon and Inverbervie CA where natural coast exists, and artificial defences are absent, core paths are the most vulnerable assets at risk from erosion and can be used to help prioritise where NBS may provide the greatest benefit.

The location and extent of core path sections predicted to be at risk are shown below (Figure 5-1).

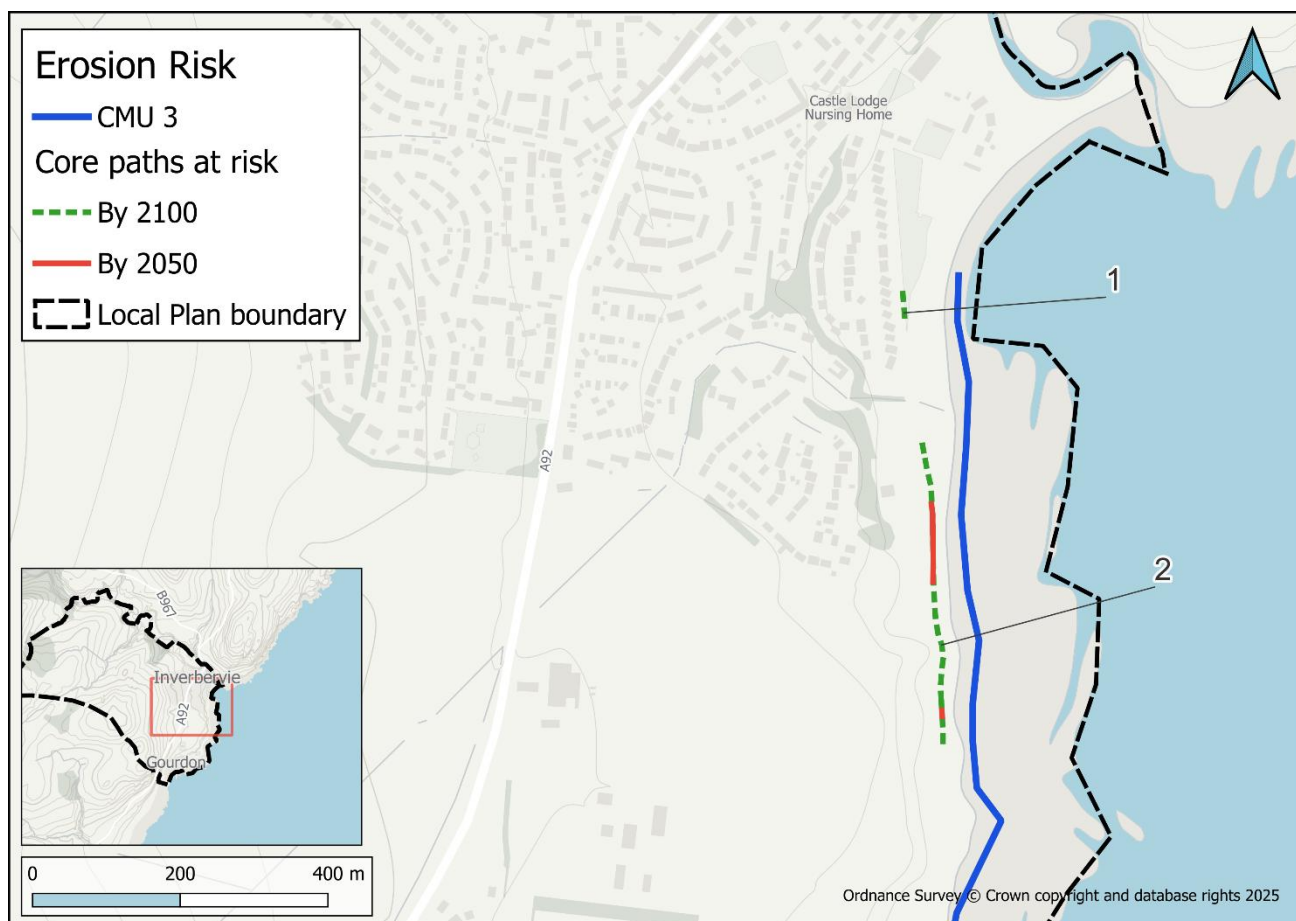


Figure 5-1: Coastal erosion risk for Gourdon and Inverbervie core paths. Numbers refer to core path sections at risk by 2100 or 2050, detailed in Table 5-1 and Table 5-2

Using DC projected data, core path sections at risk were ranked according to the amount of projected land loss for their associated sections of coast under 2100 and 2050 erosion projection (Table 5-1 and Table 5-2).

Table 5-1: Gourdon and Inverbervie. Core path sections at risk from erosion by 2100

| Core Path network name              | Feature ID | Mean land loss by 2100 (10m intervals) | Core Path affected by 2100 (m) | Approximate total land loss by 2100 (m <sup>2</sup> ) | Distance to shore (m) | Rank - 2100 land loss total |
|-------------------------------------|------------|----------------------------------------|--------------------------------|-------------------------------------------------------|-----------------------|-----------------------------|
| Coastal Path Gourdon to Inverbervie | 2          | 37                                     | 409                            | 15,133                                                | 15                    | 1                           |
| Coastal Path Gourdon to Inverbervie | 1          | 50                                     | 37                             | 1,850                                                 | 55                    | 2                           |

Table 5-2: Gourdon and Inverbervie. Core path sections at risk from erosion by 2050

| Core Path network name              | Feature ID | Mean land loss by 2050 (10m intervals) | Core Path affected by 2050 (m) | Approximate total land loss by 2050 (m <sup>2</sup> ) | Distance to shore (m) | Rank - 2050 land loss total |
|-------------------------------------|------------|----------------------------------------|--------------------------------|-------------------------------------------------------|-----------------------|-----------------------------|
| Coastal Path Gourdon to Inverbervie | 2          | 14                                     | 115                            | 1,610                                                 | 15                    | 1                           |
| Coastal Path Gourdon to Inverbervie | 1          | NA                                     | NA                             | NA                                                    | NA                    | NA                          |

The ranking considers the product of core path length and mean predicted total erosion distance from the coast.

The much larger extent and proximity to the coast of core path feature 2 makes this section a more suitable candidate for possible re-alignment or protection than section 1. The timing of any such intervention can be facilitated using an erosion trigger as part of the Adaption Process (Section 8).

A complete review of the impacts of erosion is recommended to make sure that NBS opportunities are developed where appropriate and future realignment or re-development of core path consider these future risks.

## 6 Land based Opportunities

Where possible, the delivery of adaptation should include land-based actions. Fundamentally these include actions that support more sustainable planning and the potential future relocation of assets and receptors that are, or will be, at risk of erosion or flooding. To identify this a land-based opportunities mapping exercise was undertaken. This focused on each CMU and the CA to understand potential to identify areas where future erosion losses could be offset through safeguarding.

Consideration here is to fundamentally support that although the location of assets or receptors must change the functional impact on the CA should not be lost. Various future needs such as environmental sustainability, urban development, societal and economic development should be considered.

### 6.1 Inverbervie Caravan Park

Inverbervie Caravan Park sits alongside the River Bervie to the east end of Inverbervie. The caravan park has a raised hard-standing section with fixed caravans, and a grass section close to the river's right bank. It is only the lower section, which is for touring vehicles, that is at risk from riverbank erosion, and from a 1 in 10-year flood event. Given the high risk of flooding and the proximity of the site to the eroding riverbank, consideration should be given to relocate the caravan park in the future. **However, as stated in Section 3, The Council has no obligation to protect a privately owned site, but since the community benefits from the site's generated income and tourism, making space for relocation is recommended.**

A possible site for relocation is at the southern extent of Inverbervie on what is currently raised beach arable land, currently under the ownership of Sillyflatt Farm as identified on Scotland's Register of Sasines (Figure 6-1).

Critical to any decision on relocation of amenity assets will be working with the community and owners to make sure that there are positive impacts on tourism and recreation sectors. Relocation, while potentially undesirable, should be undertaken following a place-based approach with a view of enhancing the overall function of the CA.

The present caravan site is located within CMU 1 and the suggested re-location site within CMU 3.

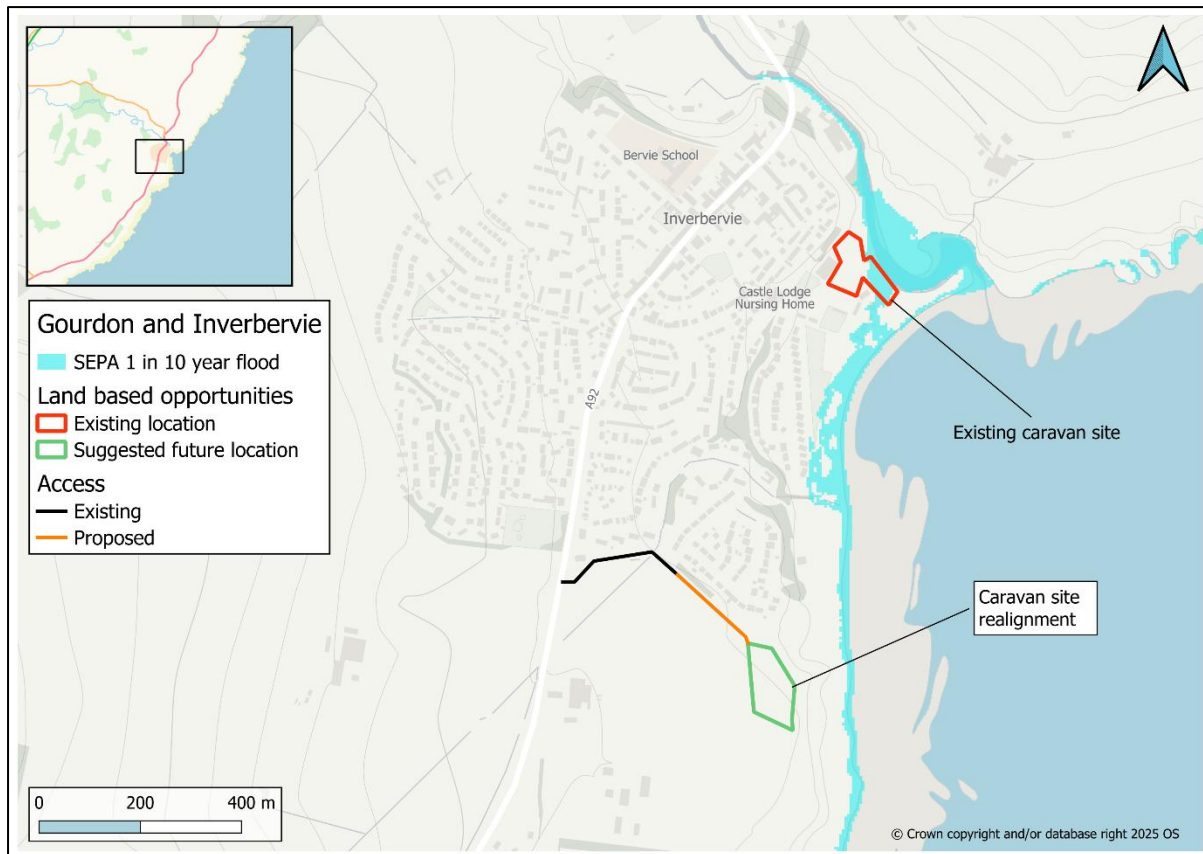


Figure 6-1: Land based opportunities - Inverbervie Caravan Park.

## 6.2 Inverbervie Beach Front Car Park

The Beach Front Car Park is located behind the shore at the end of Kirk Burn road within CMU 2. It is the main access point to Bervie Bay and is popular with tourists and the local community.

DC data shows it to be within the coastal erosion vicinity zone, but the main risk is from flooding. The lower section of the car park being vulnerable to a 1 in 200-year coastal flood event, primarily from wave overtopping. This may bring with it damage to the structures and increased vulnerability to erosion.

Given its importance to the local economy from tourism and as a valuable local community resource, making space for re-location should be considered as part of any future Adaption Plan for Inverbervie and Gourdon. One medium to long term solution, also favouring any budget restrictions, is to re-align the lower, beach side part of the car park to west of the current car park. This area is 1.5m higher on open public parkland with a few scattered trees. The trees could be retained offering a pleasant environment for the re-aligned parking area (Figure 6-2).

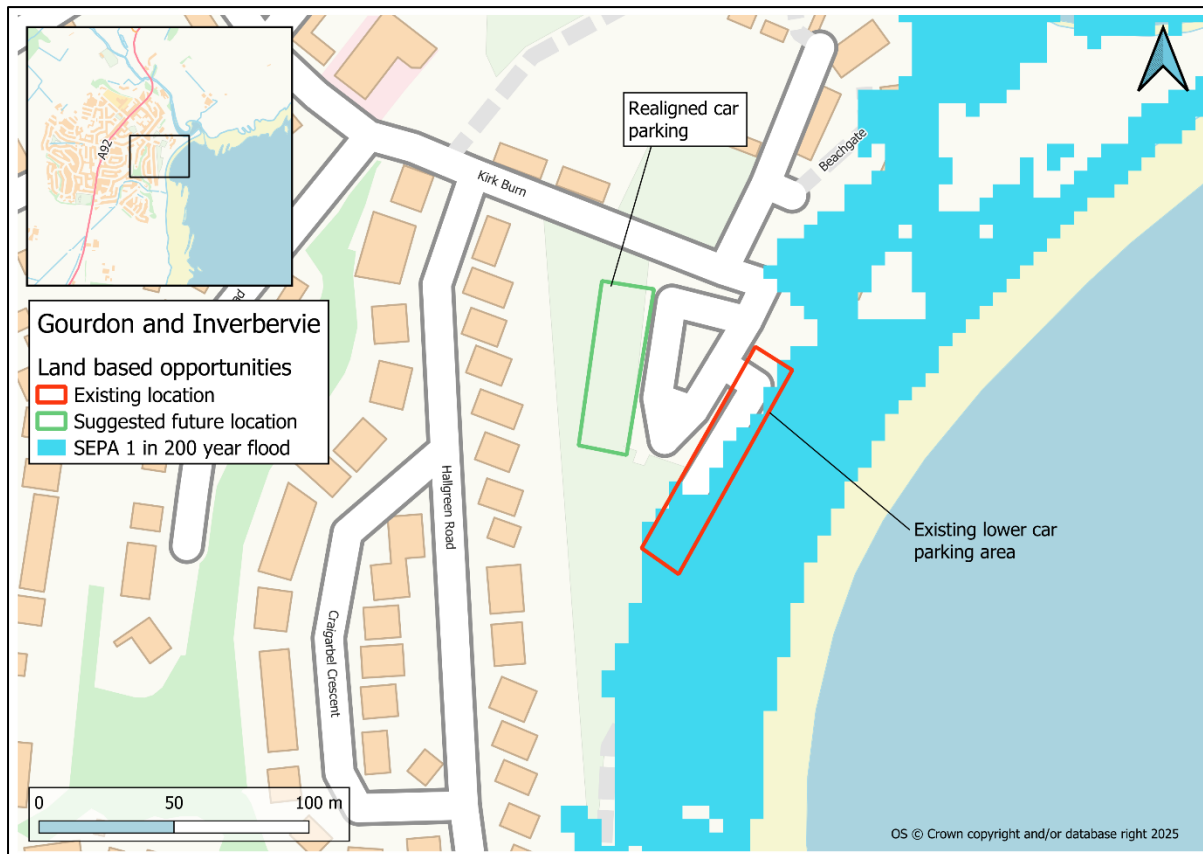


Figure 6-2: Land based opportunities - Inverbervie Beach Front Car Park.

### 6.3 Gourdon - Core Path and Play Park Car Park

The core path which joins the communities of Gourdon and Inverbervie are part of an extended network of coastal paths within Aberdeenshire. Tourists may walk in from the south or north of the settlement or start their journey from Gourdon itself. It is therefore important that parking facilities are suitably placed to allow easy access to the core path network.

To the east of the town within CMU 4 there is a small, six or seven car, dedicated parking space adjacent to the Gourdon to Inverbervie Core Path. It is also next to a children's playpark. The car park is vulnerable to overtopping from storms and a 1 in 200-year flood event, so future nearby re-alignment should be considered to maintain access to the core path and children's playpark. The suggested site is within the existing play space but will not affect the play apparatus and is in a sustainable location, being two metres above the current at-risk site (Figure 6-3).

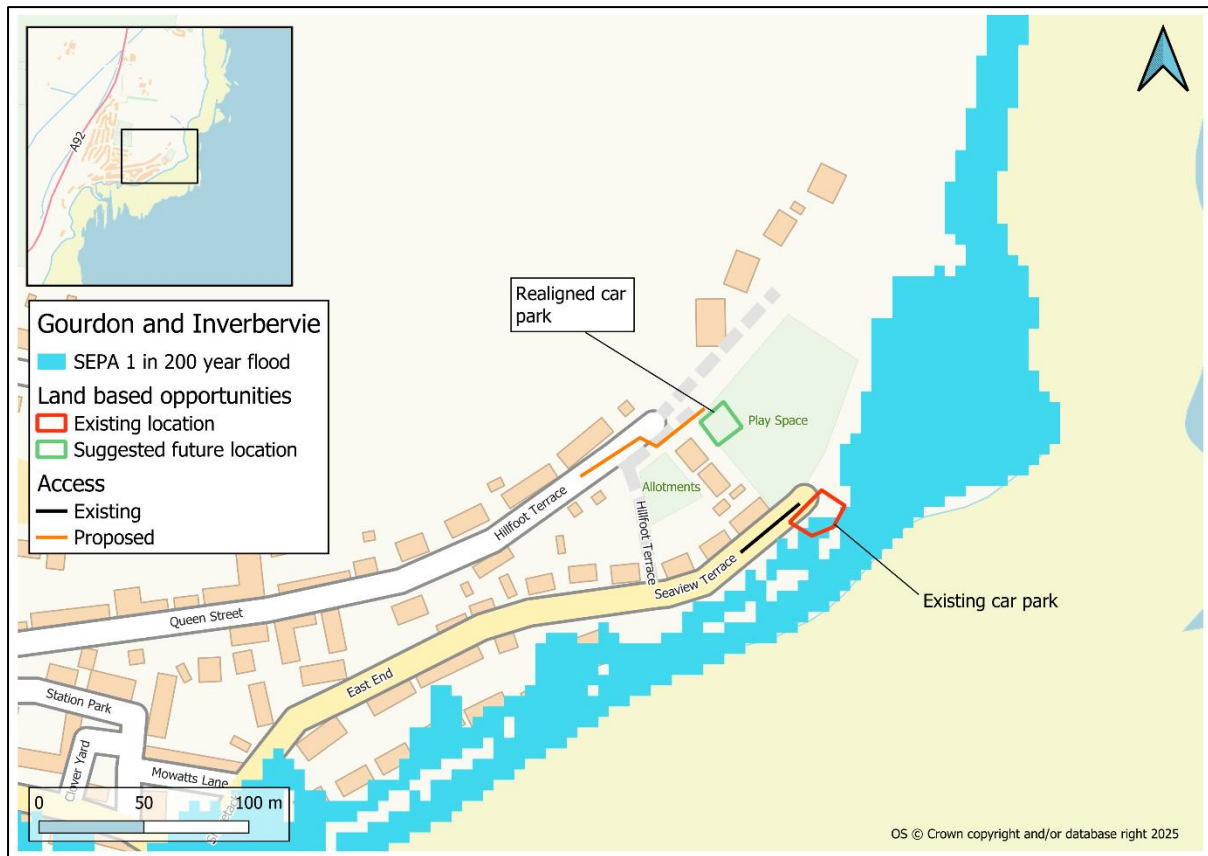


Figure 6-3: Land based opportunities - Gourdon Core Path and Play Park Car Park.

#### 6.4 Gourdon housing allocation

Land has been allocated by The Council for affordable, sustainable housing for 49 properties at Braehead as part of the Aberdeenshire 2023 LDP. This could offer re-location opportunities for the shore front residents east of Gourdon harbour (Section 2.2.5) should maintaining the currently failing sea walls prove unsustainable (Figure 6-4).

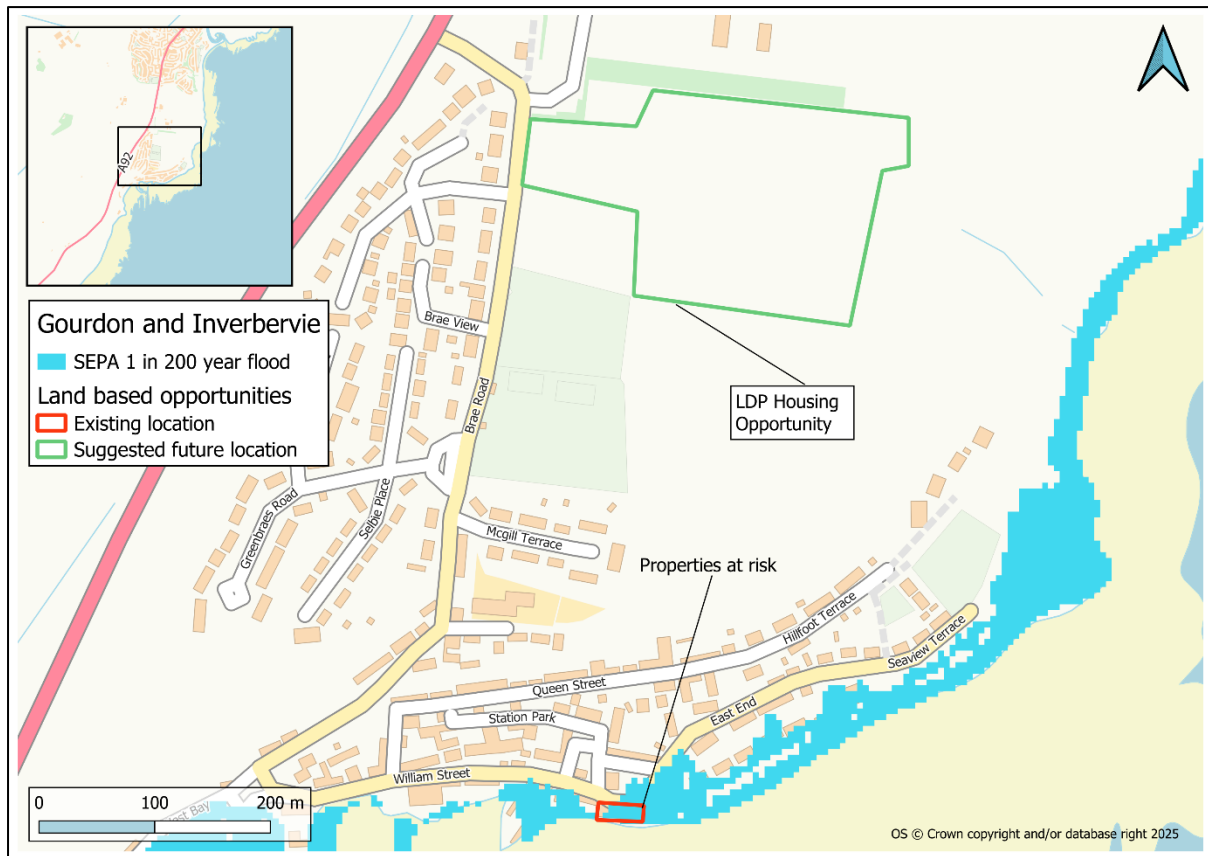


Figure 6-4: Land based opportunities - Gourdon housing

## 7 Adaptation Pathways

### 7.1 CMU Policies

Management policies have been classified based on the Scottish Government guidance into five categories. These will form the basis for development and delivery of the adaptation pathways.

1. **No Active Intervention** - Do nothing.
2. **Maintain** - Where existing structures, owned by the Council exist.
3. **Protect** - Where existing structures exist, residential properties are at risk and there is potential for a positive cost benefit to be achieved.
4. **Enhance Natural Features** - Where realistic opportunities exist for NBS to serve as risk mitigation.
5. **Make Space** - Where land use opportunities mapping has identified areas for safeguarding or offsetting loss.

Policies have been set based on the information available, and presented above, to outline both the current approach and idealistic end outcome for each CMU. It should be noted that, at this stage in the CCAP process, Idealistic Outcome Policies are not definitive and, depending on future Triggers, Actions and investigations may change. They do however, provide an initial starting point for Adaptation Pathways to work towards.

Review of the characteristics and risk associated with each CMU led to the classifications and policies in Table 7-1. These were used to develop initial Adaptation Pathways, Triggers, and an associated Implementation Plan.

Table 7-1: Gourdon and Inverbervie CMU categorisation.

| CMU | Coastal Type | Risk | Initial Policy         | Idealistic Outcome Policy |
|-----|--------------|------|------------------------|---------------------------|
| 1   | Natural      | Risk | No Active Intervention | No Active Intervention    |
| 2   | Hybrid       | Risk | Maintain               | Make Space                |
| 3   | Hybrid       | Risk | Maintain               | Make Space                |
| 4   | Natural      | Risk | No Active Intervention | Protect                   |
| 5   | Defended     | Risk | No Active Intervention | Protect                   |
| 6   | Defended     | Risk | Maintain               | Make Space                |

### 7.2 Adaptation Pathways

Development of Adaptation Pathways for each CMU are based on the classification presented above. This aims to provide a flexible approach to adaptation that works towards a defined and desirable end outcome for the CMU and CA.

Details of this outcome are however, not defined at this stage, and will ultimately be dependent on monitoring changes at the coast, or implementation or improvements in other areas that influence climate resilience e.g.

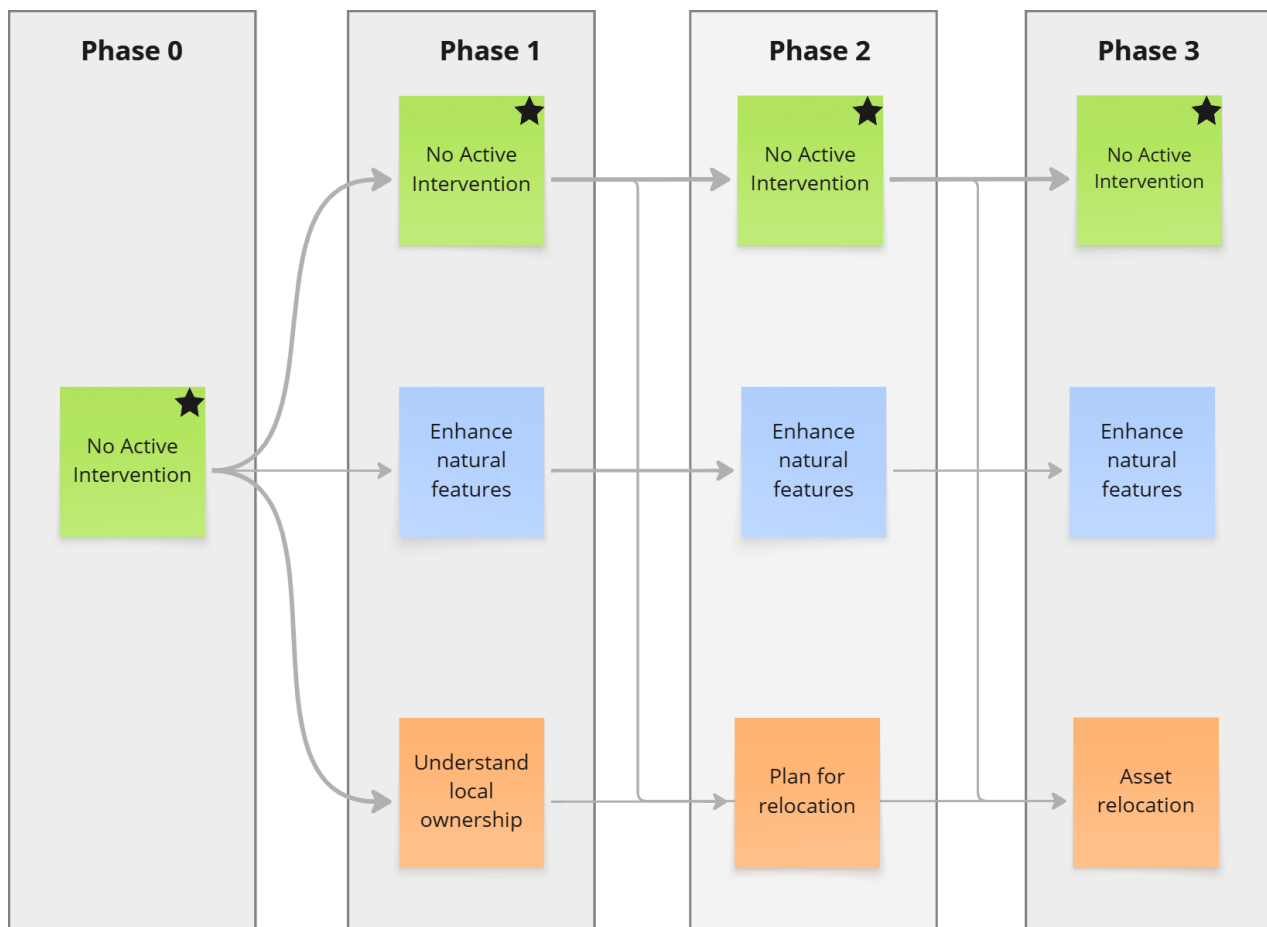
- Climate
  - Climate change guidance.
  - SEPA flood maps or risk assessments.
  - Coastal flood occurrence.
- Risk exposure
  - Change in defence condition.
  - Update to SEPA flood warning system
  - Erosion risk buffer exceeded
  - Flood risk threshold exceeded
- Socio-economics
  - Changes of asset ownership
  - Changes of land ownership
  - Community pressures

Adaptation Pathways for each CMU are presented in the following sections. How, when or if, this will be achieved is dependent on the identified Triggers being realised and the outcomes of the associated Actions.

### 7.3 CMU 1 Natural coast with risk

CMU 1 is a natural inland section of coast where the River Bervie meets the North Sea at the northern extent of Inverbervie. The right bank of the river is eroding, putting the lower section of Inverbervie caravan park at risk. No council owned assets are at risk, so the existing policy (Phase 0) for this CMU is defined as No Active Intervention with an end outcome of No Active Intervention (Figure 7-1).

Opportunities here to support delivery of the pathway through working with the community and asset relocation also exist (Section 6.1) should realignment of the caravan park be required.



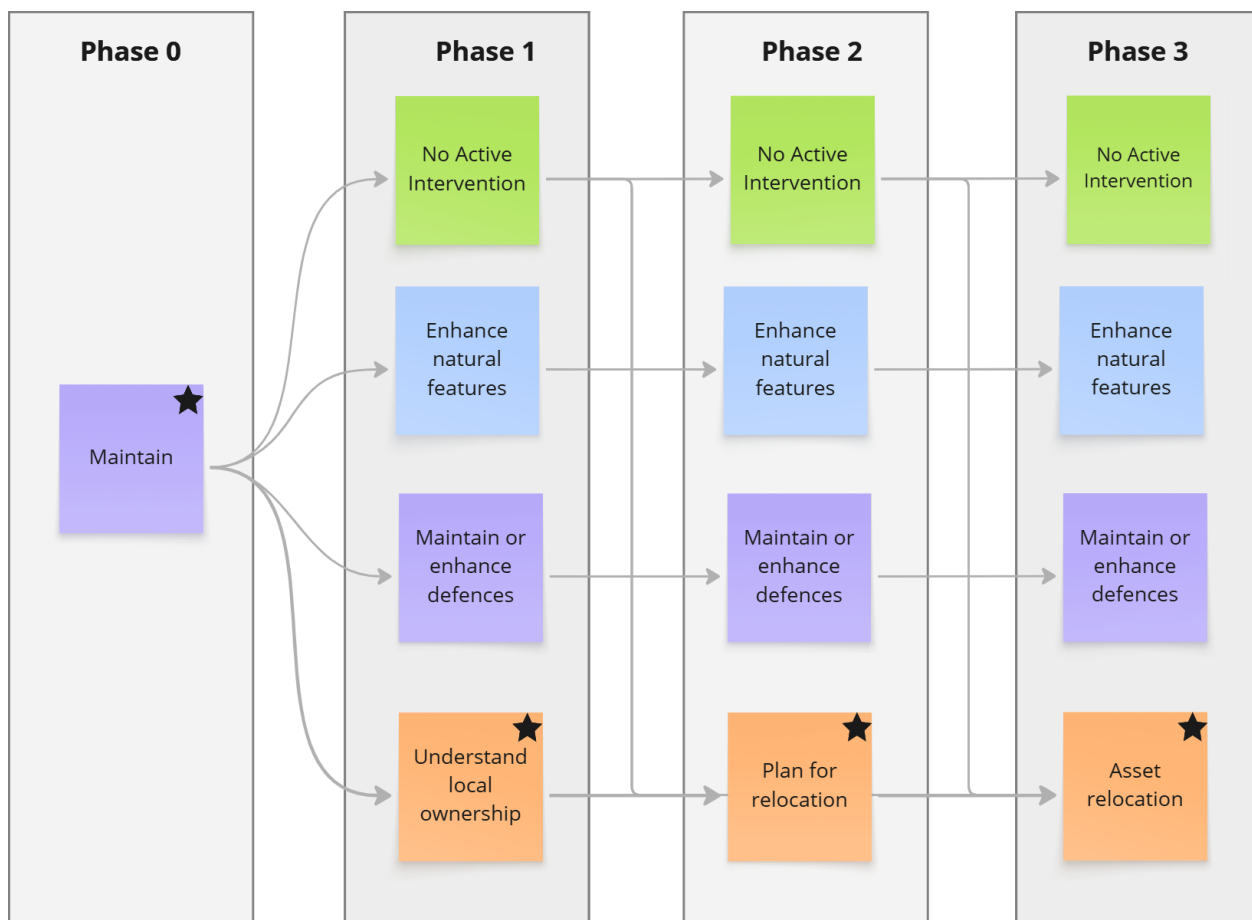
★ Preferred pathway

Figure 7-1. Identified preferred adaptation pathway for Gourdon and Inverbervie CMU 1.

### 7.4 CMU 2 and 3 Hybrid coast with risk

CMU 2 and CMU 3 are hybrid coasts with a mix of natural features and artificial defences. Artificial defences are composed of a mixture of rock armour, shingle revetments, gabion baskets and a slopping concrete mattress. The existing policy (Phase 0) for these CMUs is defined as Maintain and moving towards an end outcome of Make Space (Figure 7-1).

Opportunities here to support delivery of the pathway through enhancing natural features also exist.



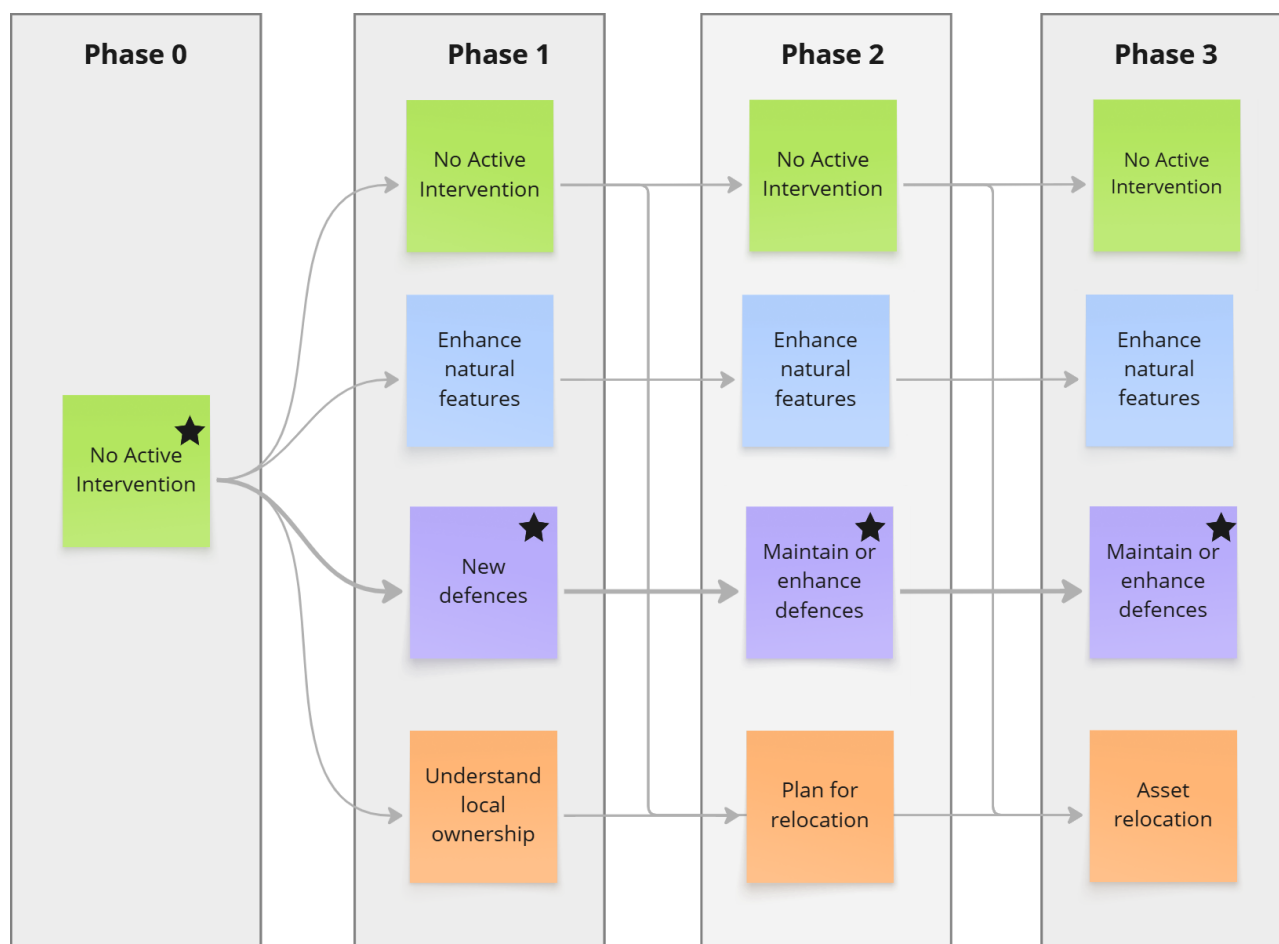
★ Preferred pathway

Figure 7-2. Identified preferred adaptation pathway for Gourdon and Inverbervie CMU 2 and 3.

## 7.5 CMU 4 Natural coast with risk

CMU 4 is a natural coast with risk of erosion and flooding. The current policy follows a No Active Intervention approach, allowing natural processes to continue.

For the adaption pathway to move to Phase 1 a pre-defined trigger must be realised. The identified Pathway then moves towards an outcome of Protect in response to the properties at risk in this CMU. Making space for the car park re-alignment is an alternative pathway, should there be a change to the management approach in future.



★ Preferred pathway

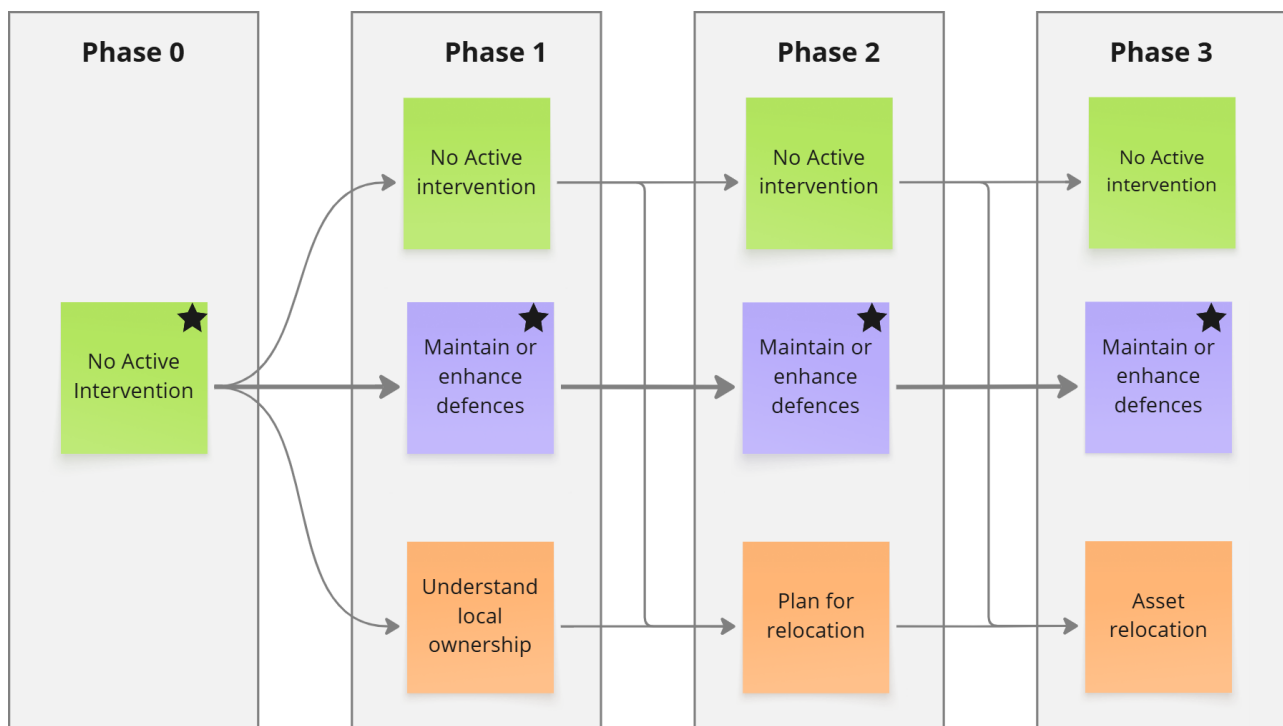
Figure 7-3. Identified preferred adaptation pathway for Gourdon and Inverbervie CMU 4.

## 7.6 CMU 5 Defended coast with risk

CMU 5 is a defended stretch of coast in an urbanised area with properties at risk from erosion and flooding, it is described in more detail above in section 2.2.5.

To our knowledge structures protecting properties in this CMU are not under council ownership, so the current policy (Phase 0) for this CMU is judged to be No Active Intervention. Given the limited space to support localised retreat, future flooding, and economic value at risk the identified final policy (Phase 3) has been proposed as Protect.

Asset Relocation of the properties at risk is an alternative pathway should the management approach change in future Adaption Plans. See Figure 7-4 below for the adaptation pathway for CMU 5.



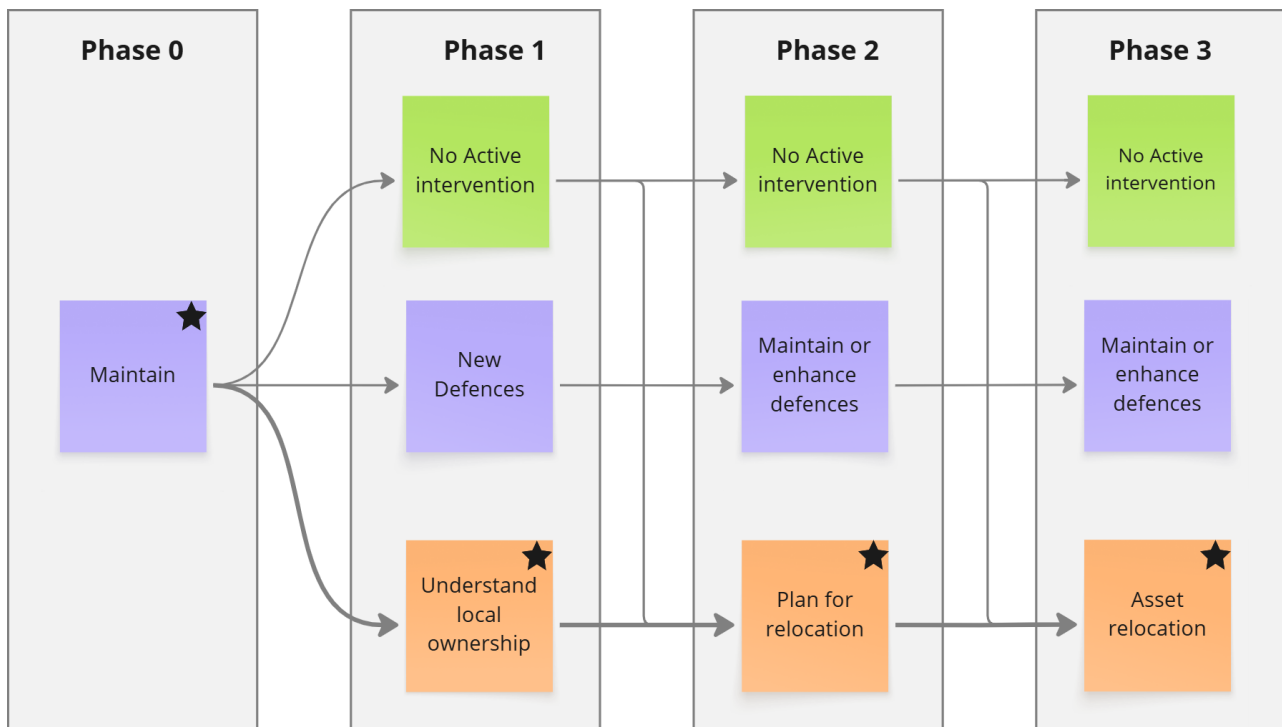
★ Preferred pathway

Figure 7-4. Identified preferred adaptation pathway for Gourdon and Inverbervie CMU 5.

## 7.7 CMU 6 Defended coast with risk

CMU 6 is a defended section of coast with vertical stone and concrete walls, and sections of rock armour along a shingle beach protecting the seafront non-residential properties to the west of Gourdon. Further details on this CMU can be found above in Section 2.2.6.

The vertical wall protecting the properties in this CMU is eroding in places, and as with CMU 5, there is limited space for localised retreat so Maintain is the recommended end policy. The current policy (Phase 0) is Maintain, enabling continued protection of the seafront properties.



★ Preferred pathway

Figure 7-5. Identified preferred adaptation pathway for Gourdon and Inverbervie CMU 6.

## 8 Adaptation Process

### 8.1 Implementation Plan

To support the delivery of the Adaptation Framework, a single Implementation Plan is applied to the entire CA with generic triggers and actions set that are relevant across the CA. Specific triggers and actions are then assigned to each CMU based on the Risk Assessment. Outcomes of the Implementation Plan link to the Adaptation Pathway specific to each CMU.

Delivery of the Implementation Plan has three stages (Figure 8-1):

1. Monitoring and Triggers (section 8.2)
2. Actions (section 8.3)
3. Outcomes (section 8.4)

The outcome of the Implementation Plan determines what direction will be followed within the Adaptation Pathway when moving to a new phase.

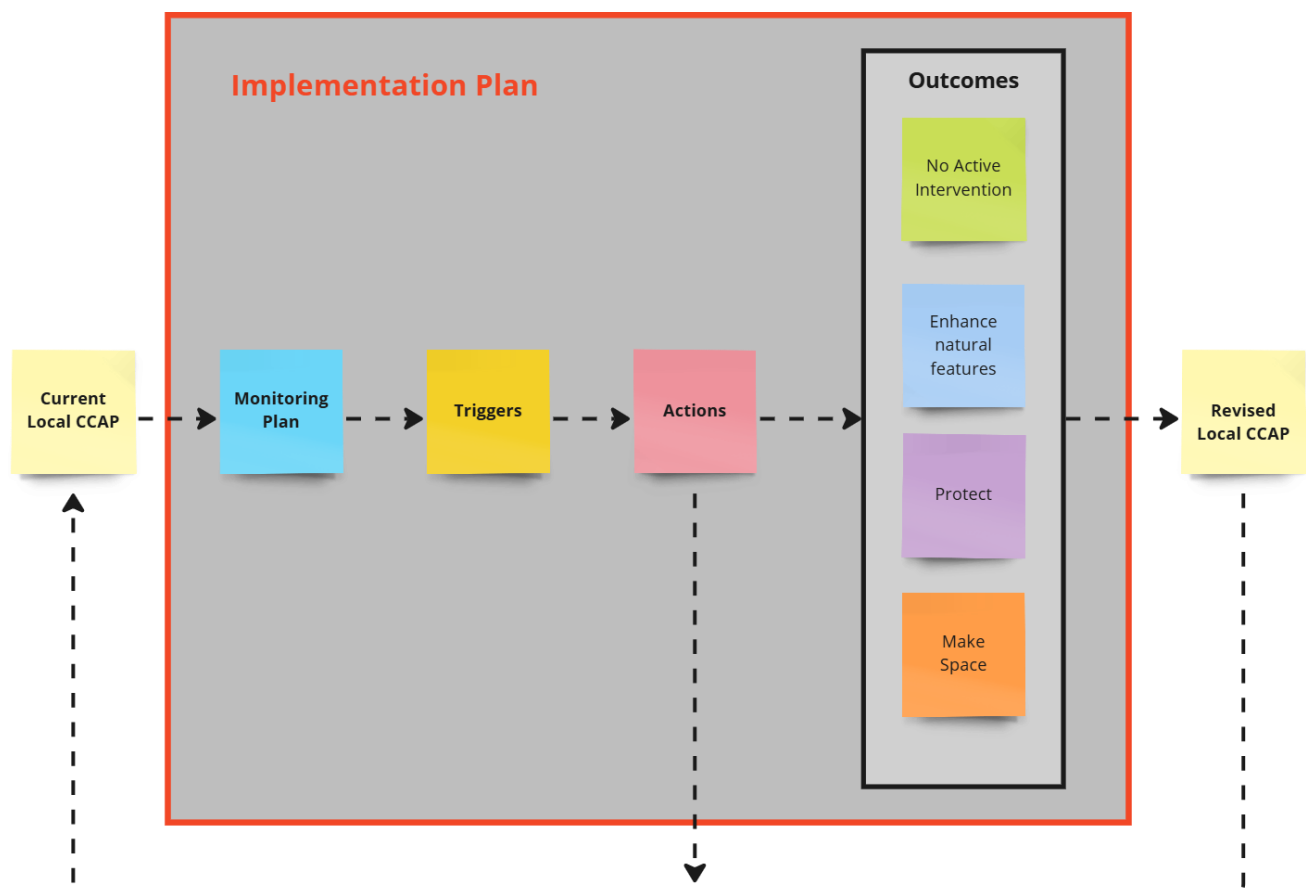


Figure 8-1: Implementation Plan.

## 8.2 Monitoring and Triggers

### 8.2.1 Monitoring

Triggers are realised through monitoring of available data that informs risk of flooding and erosion. Triggers signal the requirement to deliver the Implementation Plan, which may lead to a review of the Risk Assessment and potentially change to the Adaptation Pathway.

Triggers are categorised as:

- Natural systems triggers.
- Climate triggers.
- Risk exposure triggers.
- Socio-economic triggers.

These are subsequently grouped into categories with each requiring a plan for monitoring within the CA:

- Third party data and information
- Aberdeenshire Council data and information
- Aberdeenshire Council monitoring
- External pressure

### 8.2.2 Trigger Classification

Classification of the Triggers fall into two parts.

1. Generic triggers applicable to the entire CA.
2. Bespoke triggers applicable to individual CMUs.

Climate, natural system, and socio-economic triggers are generic for the whole CA, but risk exposure triggers related to physical flooding, erosion and overtopping thresholds are specific to each CMU. For the Gourdon and Inverbervie CA these are summarised in Table 8-4.

Effective review of these requires development of a monitoring plan of risk at each CMU as follows:

- CMU 1: monitoring of erosion and flood risk.
- CMU 2: monitoring of erosion, flood risk and defence condition.
- CMU 3: monitoring of erosion, flood risk and defence condition.
- CMU 4: monitoring of erosion and flood risk.
- CMU 5: monitoring of erosion, flood risk and defence condition.
- CMU 6: monitoring of erosion, flood risk and defence condition.

### 8.2.3 CMU specific flooding triggers

Based on SEPA's NFRA data, where there is risk of flooding, the lowest asset per flood risk location is used to determine when a flooding trigger will be activated. Assets considered at risk from flooding include:

- Residential properties.
- Key roads.
- Coastal defences that provide extreme sea level flood protection.

Where flood risk is present in a CMU, the lowest residential property (minus 300mm freeboard) or point on a key road is used to determine trigger level status based on 1 in 2 year (road only), 1 in 10 year and 1 in 200 year flood predictions (Table 8-1).

In the absence of a SEPA 1 in 2-year flood map, UK CFB Extreme Sea Level data was used in conjunction with the SEPA Phase 2 DTM to derive a 1 in 2-year flood map for each to establish if any roads are at risk. SEPA flood maps are available for 1 in 10, 1 in 200 and future 1 in 200-year coastal flood events.

The CMU-specific flooding trigger is realised if the receptor lies within the specified flood extent. There are two levels to this Trigger realisation that result in different Actions. These also vary depending on the consequence of flooding:

- **Residential properties**
  - 1) Within 1 in **200-year** flood extent.
    - Increase monitoring and plan for assessment.
  - 2) Within 1 in **10-year** flood extent.
    - Undertake assessment and plan for intervention.
- **Key Roads**
  - 1) Within 1 in **10-year** flood extent.
    - Increase monitoring and plan for assessment.
  - 2) Within 1 in **2-year** flood extent.
    - Undertake assessment and plan for intervention.

Locations of the assets used to define the flooding Triggers are shown in Figure 8-2. All property and road flooding triggers (if applicable) for CMUs 2, 5 and 6 for the Gourdon and Inverbervie CA (Table 8-1) with topographic information are provided in Appendix B.1

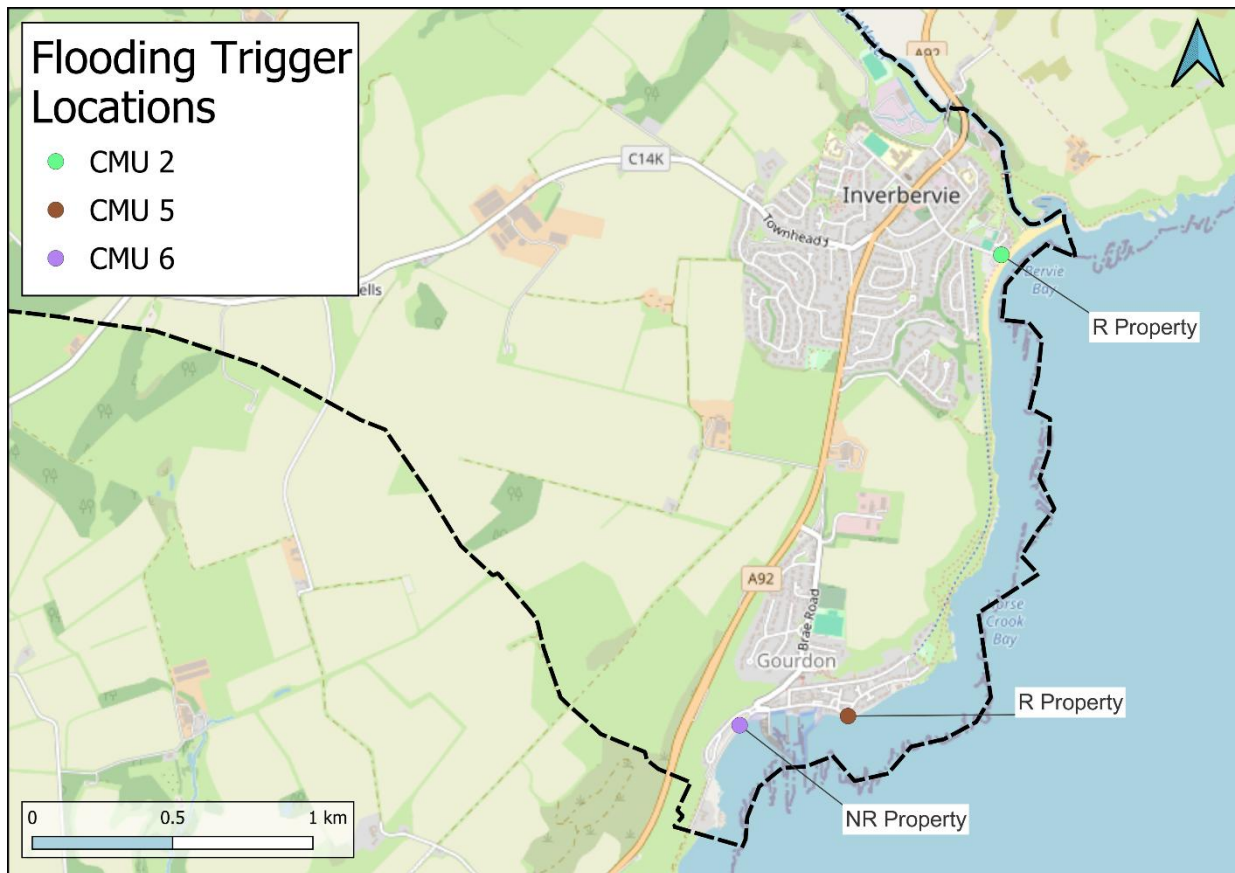


Figure 8-2: Overview of Gourdon and Inverbervie flooding trigger locations.

#### 8.2.3.1 CMU 2 flooding triggers

The property asset for the CMU 2 flooding trigger has an elevation of 7.2 mAOD which is within the SEPA 1 in 10-year flood event zone (Table 8-1). **A Level 2 property flooding trigger is therefore realised.**

It should be noted that CFB water levels for a 1 in 10-year event at this location are at 3.2 mAOD, so predicted flooding is likely to be caused by wave overtopping (Appendix B.1).

There is no road flooding trigger for CMU 2 as no roads lie within the 1 in 200-year flood zone and therefore, not at immediate risk from flooding.

#### 8.2.3.2 CMU 5 and CMU 6 flooding triggers

There are two property asset flooding triggers for the settlement of Gourdon. The CMU 5 trigger is for a residential property to the east of the Gourdon harbour with an elevation of 3.4 mAOD. The CMU 6 trigger is for a non-residential property to the west of the harbour with an elevation of 4.6 mAOD. Both properties are within the SEPA 1 in 10-year flood event zone (Appendix B.1). **A Level 2 property flooding trigger is therefore realised at both locations** (Table 8-1).

There is no road flooding trigger for CMU 5 or CMU 6 as the lowest key roads at risk in both units are behind and higher, than their respective trigger property.

Table 8-1: CMU-specific flooding triggers for Gourdon and Inverbervie properties and roads.

| CMU | Lowest level of Property/Road (mAOD) |     | Property – Freeboard (mAOD) | Trigger met   |
|-----|--------------------------------------|-----|-----------------------------|---------------|
| 2   | Property                             | 7.2 | 6.9                         | Yes (Level 2) |
| 5   | Property                             | 3.4 | 3.1                         | Yes (Level 2) |
| 6   | Property                             | 4.6 | 4.3                         | Yes (Level 2) |

#### 8.2.4 CMU-specific erosion triggers

Where there is risk of erosion, the distance from the asset at risk to the coast is used to define the Trigger. For properties, roads and other features, the coast is defined by the present day MHWS position in DC. Assets considered at risk from erosion include:

- Residential properties.
- Key roads.
- Other features, such as carparks and golf courses.

To note, if two assets are in the same location (e.g. a road and property) only the most seaward asset is used to define the Trigger for that CMU.

As with the other CMU-specific triggers, a two-level approach is defined using buffers around the asset at risk. The associated action is, again, dependent on the consequence and asset at risk.

Erosion buffer distances (metres) for each level are defined as follows:

- **Residential properties**
  1. Maximum of historic erosion rate multiplied by 20 or 20m.
    - Increase monitoring and plan for assessment.
  2. Maximum of historic erosion rate multiplied by 10 or 10m.
    - Undertake assessment and plan for intervention.
- **Roads and other features**
  1. Maximum of historic erosion rate multiplied by 5 or 5m.
    - Increase monitoring and plan for assessment.
  2. Maximum of historic erosion rate multiplied by 2 or 2m.
    - Undertake assessment and plan for intervention.

No erosion triggers have been met for properties in CMU 2, 3 or 4 (Table 8-2). Location of all assets used for erosion triggers are shown in an overview, Figure 8-3, and in detail in Appendix B.2.

Table 8-2: CMU-specific erosion triggers for Gourdon and Inverbervie properties, roads and

features. Any cells shaded red indicate that the erosion trigger has been met.

| CMU | Maximum historical change rate (m/year) | Present-day distance of Property to coast (m)          |    | Erosion trigger level 1:<br>Coast X m from property | Erosion trigger level 2:<br>Coast X m from property |
|-----|-----------------------------------------|--------------------------------------------------------|----|-----------------------------------------------------|-----------------------------------------------------|
| 2   | 0.1                                     | RP                                                     | 41 | 20.0                                                | 10.0                                                |
| 4   | 0.0                                     | RP                                                     | 25 | 20.0                                                | 10.0                                                |
| CMU | Maximum historical change rate (m/year) | Present-day distance of Road or core path to coast (m) |    | Erosion trigger level 1:<br>Coast X m from road     | Erosion trigger level 2:<br>Coast X m from road     |
| 3   | 0.5                                     | Core path                                              | 15 | 5.0                                                 | 2.0                                                 |

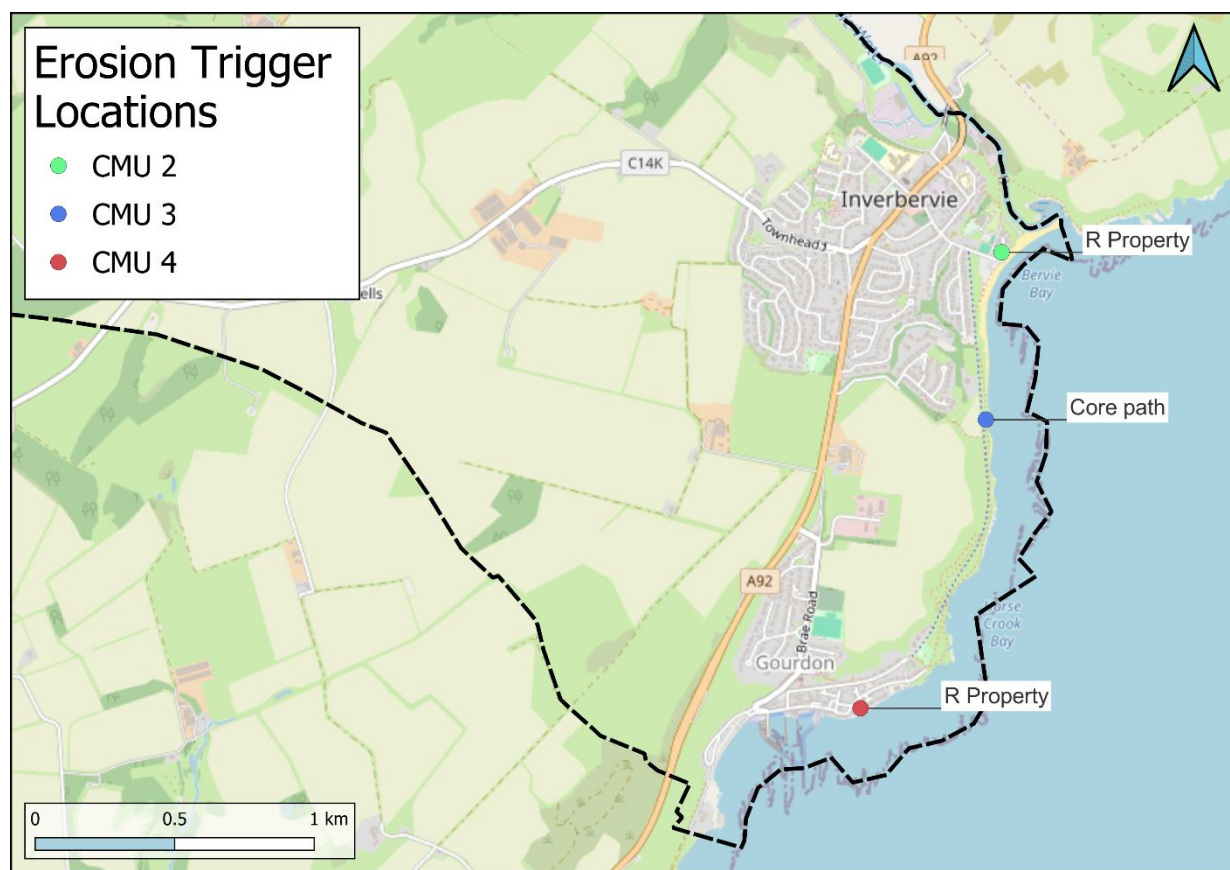


Figure 8-3: Gourdon and Inverbervie erosion trigger locations.

### 8.2.5 CMU-specific condition triggers

Where a coastal defence is present in a CMU, a CMU-specific trigger will be applied to the condition of the coastal defence. Currently, coastal defences are present in:

- CMU 2
- CMU 3
- CMU 5
- CMU 6

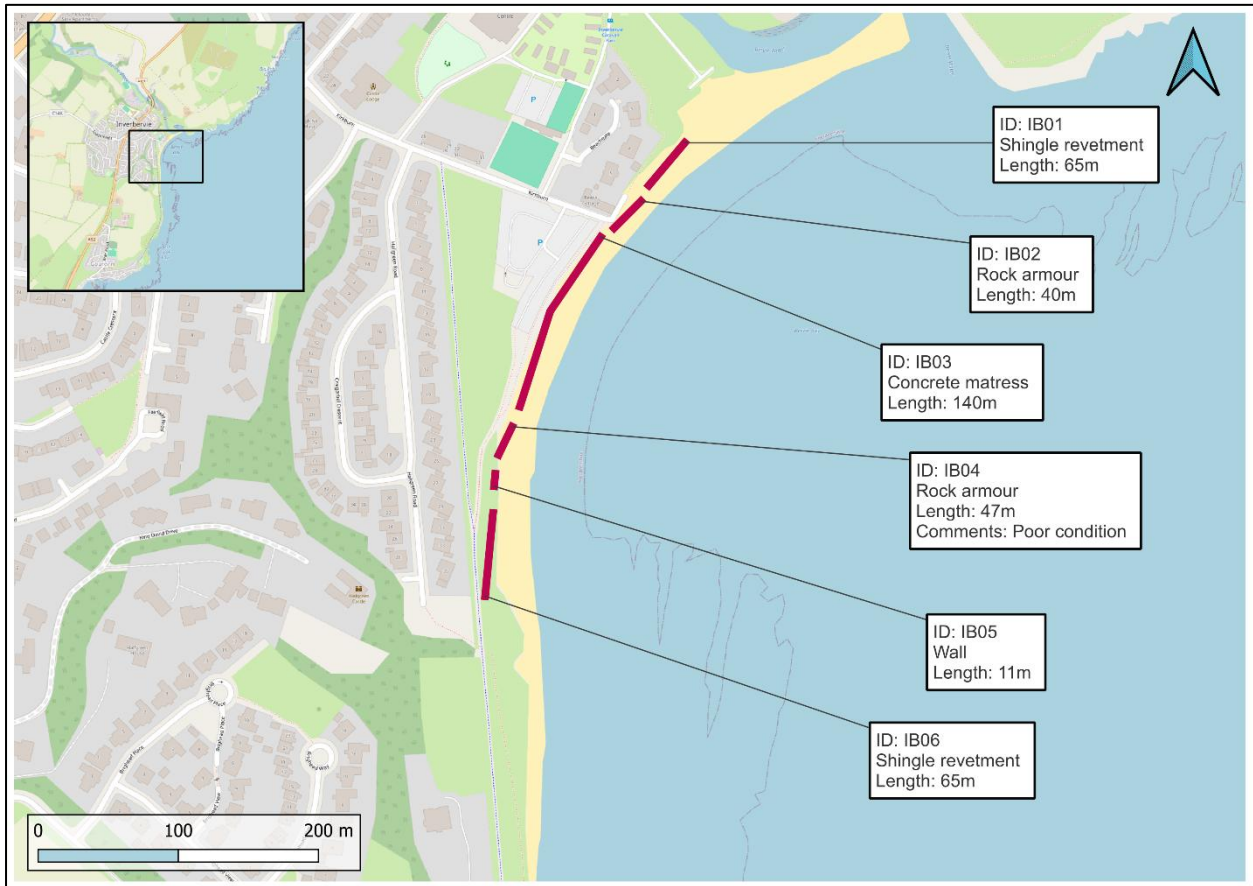


Figure 8-4: Coastal defences - Inverbervie. Indicative locations shown by red lines. Comments from JBA 2025 survey.

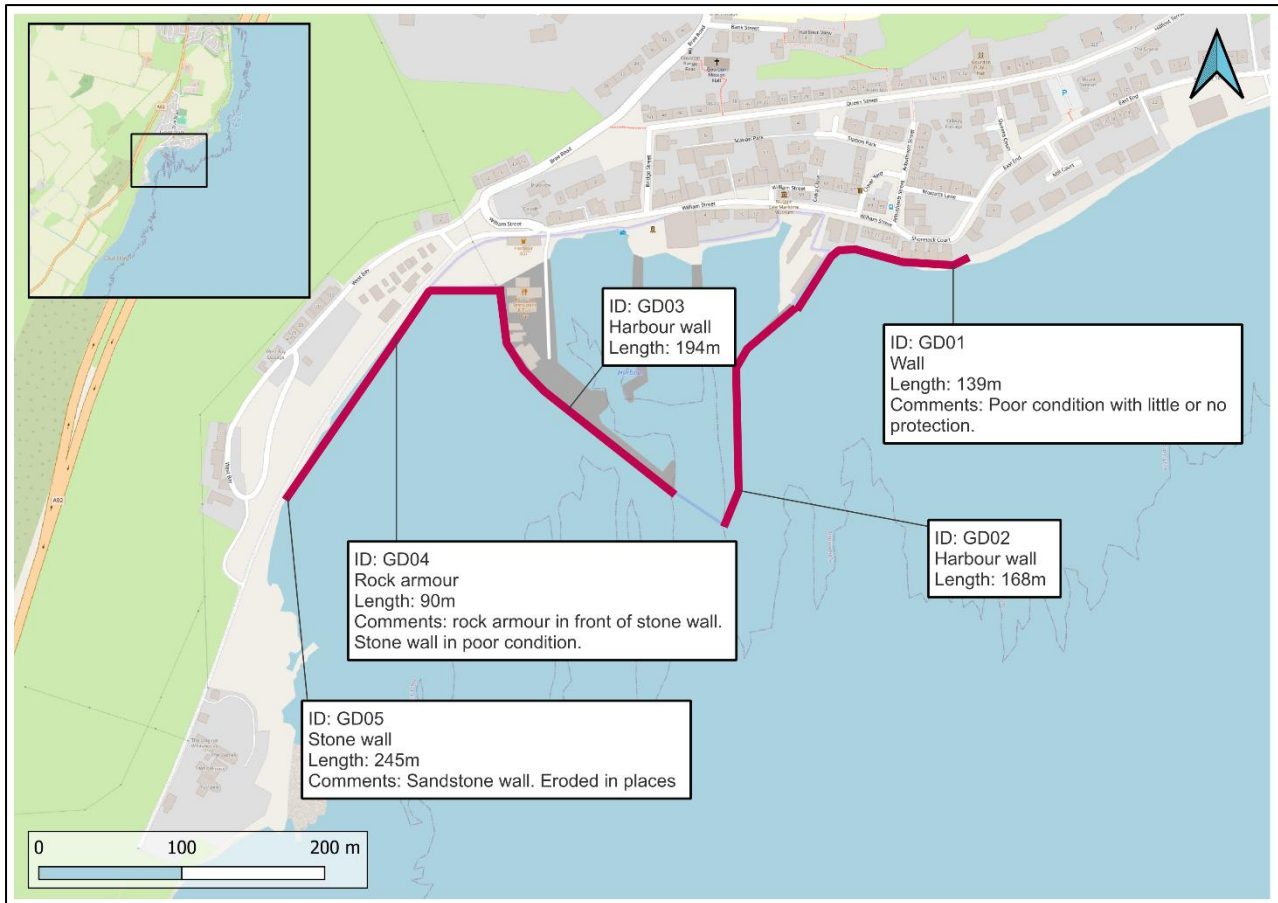


Figure 8-5: Coastal defences - Gourdon. Indicative locations shown by red lines. Comments from JBA 2025 survey.

As with the other CMU-specific triggers, a two-level condition trigger approach and associated action is defined using the Grades of coastal defence condition according to the EA and Defra condition assessments<sup>7</sup>.

- **Condition Trigger level 1:**
  - Defence condition Grade 4
    - Increase monitoring and plan for assessment.
- **Condition Trigger level 2:**
  - Defence condition Grade 5:
    - Undertake assessment and plan for intervention.

An exception to the above trigger grades is for the harbour wall, with a maintenance regime of 3, and therefore a target grade of 2. Grade 3 in this instance would cause a Level 1 trigger, and grade 4 a Level 2 trigger.

Following the 2025 survey of coastal defence asset condition, one of the 8 distinct Regime 2 assets was grade 4 and one was grade 5. Although the shingle revetment baskets in

<sup>7</sup> Environment Agency (2013) Practical guidance on determining asset deterioration and the use of condition grade deterioration curves: Revision 1.

Bervie Bay were Grade 4, this did not trigger an alert as the Maintenance regime of 1 for this asset requires an annual inspection and Health and Safety repair only, with no specific need to maintain a specific grading according to the EA guidance (Appendix A) Defence Condition.

A prioritisation matrix for monitoring the status of defence assets in the CA is given in Appendix A. If the condition grade for an asset exceeds the target grade for that asset's Maintenance Regime, then action should be taken to ensure the asset remains effective. The Alert flag in the matrix highlights such assets, and those are summarised in Table 8-3 along with their Trigger Level. Risk scores consider the Maintenance Regime (assumed), Grade, time to next grade transition and whether there is flood risk to properties and/or predicted future erosion at the defence location.

Table 8-3: Gourdon and Inverbervie priority defence assets. Full asset list in Appendix A

| CMU | Defence ID | Structure     | Maintenance Regime | Grade | Time to grade transition (years) | Rank | Trigger Level |
|-----|------------|---------------|--------------------|-------|----------------------------------|------|---------------|
| 5   | GD01       | Vertical wall | 2                  | 5     | 0                                | 1    | 2             |
| 3   | IB04       | Rock armour   | 2                  | 4     | 5                                | 4    | 1             |

### 8.3 Actions

Actions, like Triggers, can also be applied to the entire CA, or to specific CMUs where the risk of flooding and/or erosion is identified. Actions will be specific to CMUs where, for example, a coastal defence is present; a natural protective feature is present; the risk of flooding/erosion is localised; assets are at risk of flooding/erosion.

Actions applicable to all and specific CMUs in Gourdon and Inverbervie CA have been identified in (Table 8-4).

#### Review risk assessment:

- Involves a review of available data and associated risk assessment. Increased monitoring, planning, and implementing an assessment, and planning for intervention because of the erosion and flooding triggers are included in the review risk assessment action.

#### Community engagement:

- **Places:** Involves local groups, such as Councillors and community groups.
- **Practice:** Involves third party stakeholders, such as SEPA, Scottish Government, Nature Scot etc.
- **Asset:** Includes private defences harbours and utilities specific to defended or hybrid CMUs.

#### Post flood data collection:

- Involves community engagement, surveys, photographs etc.

**New risk assessment:**

- Following a review of the current risk assessment and/or community engagement, a new risk assessment may be required. Should a new assessment be deemed necessary this should follow appropriate guidance<sup>8</sup> and include all necessary components to develop a preferred Adaptation Pathway and associated Action Plan for delivery. E.g. risk, economics, social, environment, engineering, land use planning etc.

Actions bridge the gap between Triggers and Outcomes and define what processes need to be implemented before the most appropriate Outcome is recognised and delivered for each CMU. Actions linked to specific triggers and relevant Aberdeenshire CMU is included in Table 8-4.

Table 8-4: Triggers, trigger categories and associated actions for each Gourdon and Inverbervie CMU.

| Category               | Trigger                    | Action                                                                              | Gourdon and Inverbervie CMU |
|------------------------|----------------------------|-------------------------------------------------------------------------------------|-----------------------------|
| <b>Natural Systems</b> | Changes to habitat         | Community engagement (places)                                                       | CMU 2<br>CMU 3<br>CMU 4     |
|                        | Changes to greenspace      | Community engagement (places)                                                       | CMU 2<br>CMU 3<br>CMU 4     |
| <b>Climate</b>         | Update to climate guidance | Review risk assessment<br>Community engagement (practice)                           | All                         |
|                        | Update to SEPA flood maps  | Review risk assessment<br>Community engagement (practice)                           | All                         |
|                        | Coastal flood occurrence   | Review risk assessment<br>Community engagement (places, asset)<br>Post flood survey | All                         |
| <b>Risk exposure</b>   | Defence condition          | Community engagement (asset)                                                        | CMU 2<br>CMU 3              |

<sup>8</sup> Scottish Government. 2016. Flood protection appraisals: guidance for SEPA and responsible authorities <https://www.gov.scot/publications/guidance-support-sepa-responsible-authorities/pages/2/>

|                       |                               |                                                                   |                         |
|-----------------------|-------------------------------|-------------------------------------------------------------------|-------------------------|
|                       |                               |                                                                   | CMU 5<br>CMU 6          |
|                       | Update to SEPA flood warning  | Review risk assessment<br>Community engagement (places, practice) | All                     |
|                       | Erosion buffer exceeded       | Review risk assessment<br>Community engagement (places)           | CMU 2<br>CMU 3<br>CMU 4 |
|                       | Flood risk threshold exceeded | Review risk assessment<br>Community engagement (places)           | CMU 2<br>CMU 5<br>CMU 6 |
|                       | Update to Dynamic Coast       | Review risk assessment<br>Community engagement (practice)         | All                     |
| <b>Socio-economic</b> | Changes of asset use          | Community engagement (asset)                                      | All                     |
|                       | Changes of asset owner        | Community engagement (asset)                                      | All                     |
|                       | Community pressure            | Review risk assessment<br>Community engagement (places)           | All                     |

## 8.4 Phase 0 Actions

Phase 0 Actions require immediate attention and have been identified by associated triggers realised through the development process of this initial CCAP for Gourdon and Inverbervie. These are outlined below. Triggers realised at Level 2 mean that capital intervention should be planned for in the short-term. While the policies developed here can help steer this, the ultimate form of the intervention (e.g. dune enhancement or relocation) requires a specific assessment in collaboration with the wider CCAG.

- CMU 2:
  - Trigger: Flooding risk threshold exceeded (level 2)
  - **Action:** Undertake assessment and plan for intervention.
- CMU 3:
  - Trigger: Condition risk threshold exceeded (level 1)
  - **Action:** Increase monitoring and plan for assessment.
- CMU 5:

- Trigger: Flooding risk threshold exceeded (level 2)
- **Action:** Undertake assessment and plan for intervention.
- CMU 5:
  - Trigger: Condition risk threshold exceeded (level 2)
  - **Action:** Undertake assessment and plan for intervention.
- CMU 6:
  - Trigger: Flooding risk threshold exceeded (level 2)
  - **Action:** Undertake assessment and plan for intervention.

As the Implementation Plan is applied at CMU level, the ultimate outcome is dependent on the CMU and the associated Adaptation Pathway. Figure 8-6 summarises the general and specific CMU outcomes for the Gourdon and Inverbervie CA.

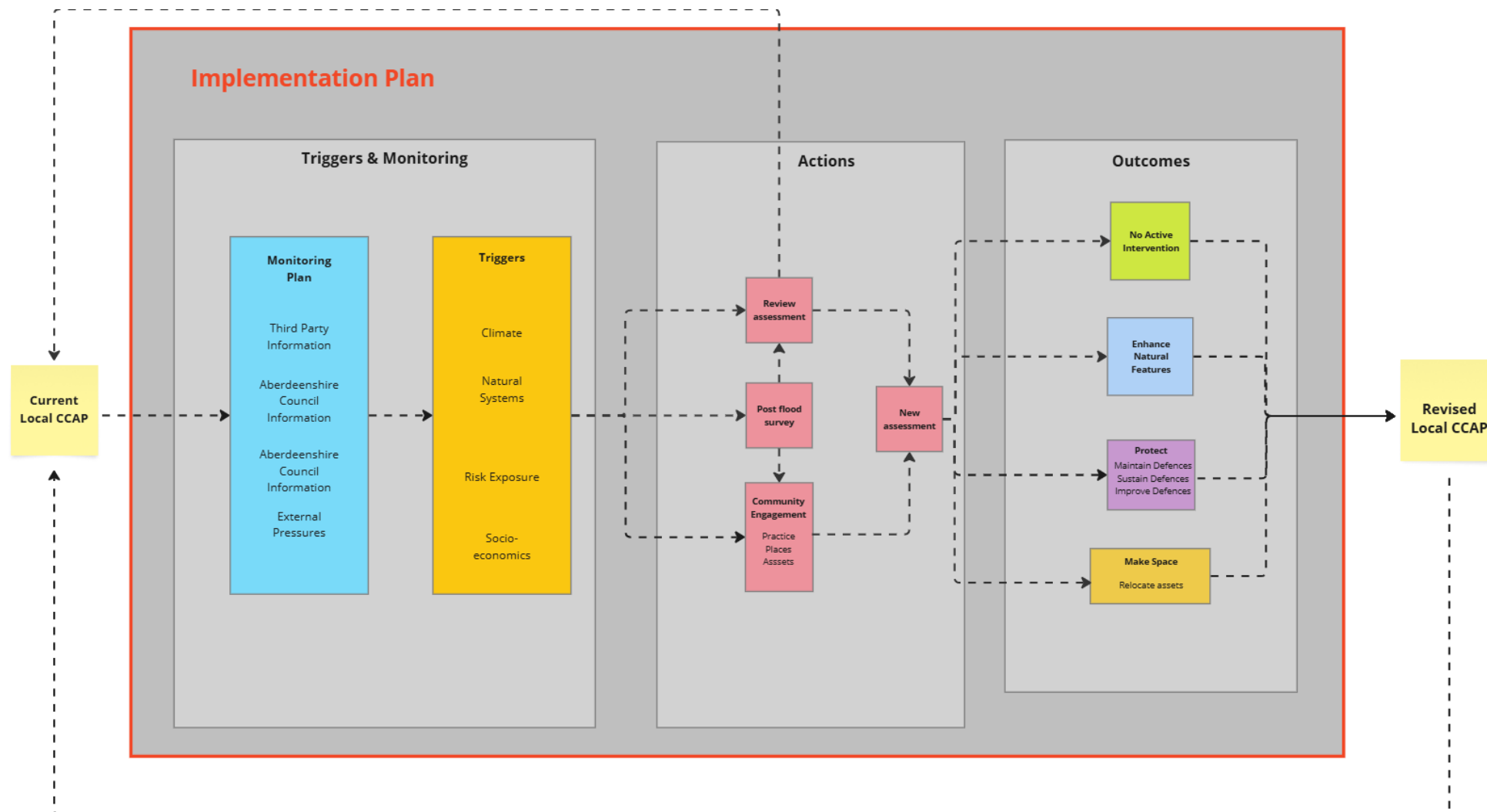


Figure 8-6: Complete Implementation Plan for Gourdon and Inverbervie CCAP

## 8.5 Example application

Figure 8-7 provides a schematic describing an example application of the Implementation Plan and how it fits in with the wider Adaptation Framework for Gourdon and Inverbervie. The red box highlights the processes described in this iteration of the CCAP.

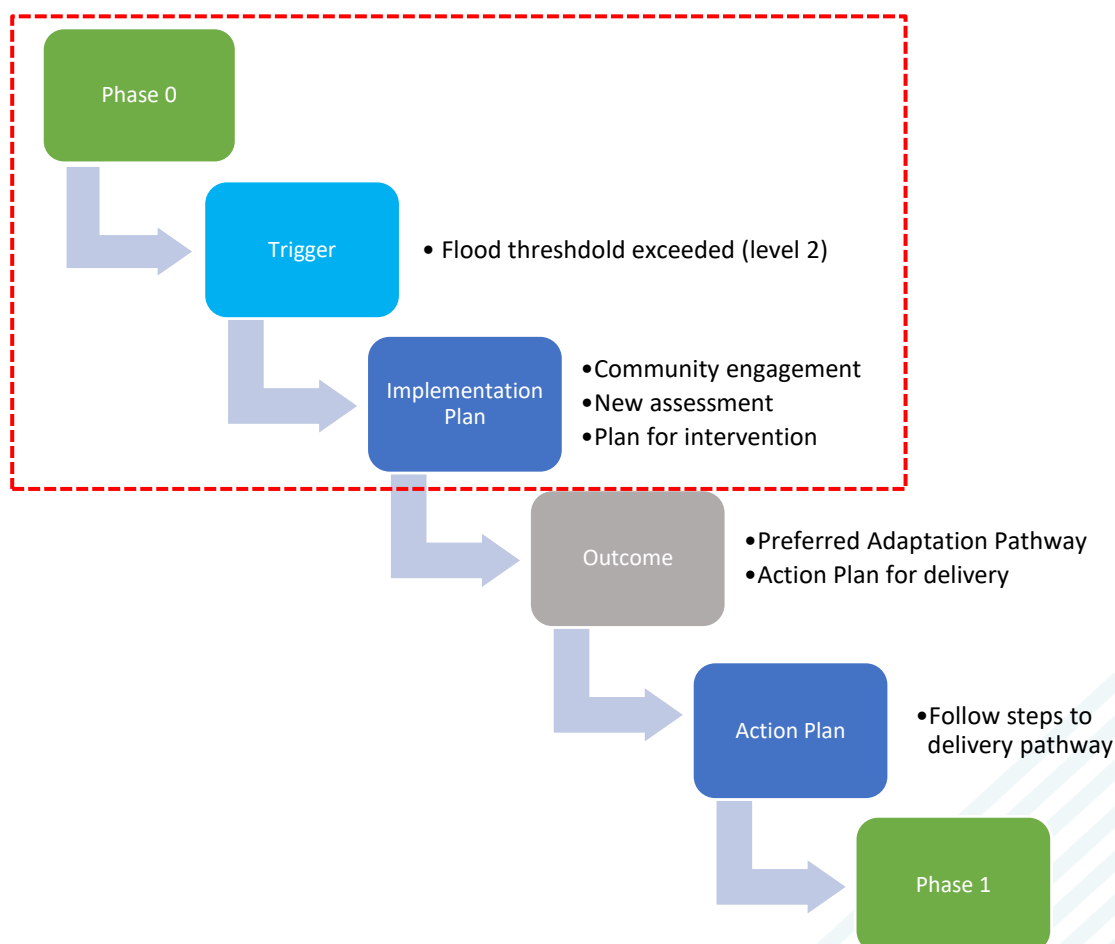


Figure 8-7: Example application of Phase 0 to Phase 1 of the adaptation process and how the Implementation Plan works with Adaptation Pathways and Action Plans.

## 8.6 Supporting Steps and Proactive Actions

The nature of adaptation means that future decisions and directions are unknown and will be affected by external changes not necessarily under Aberdeenshire Council's influence. It is critical that proactive supporting steps and Proactive Actions are undertaken to enable effective decision making in the future.

Proactive Actions are defined as those whereby there should only be benefit. Undertaking these can therefore only have a positive impact on supporting adaptation or increasing resilience.

At this stage in the adaptation planning process nine such actions have been identified. These have been developed focusing on the key pillars identified previously and through

review and understanding of key knowledge gaps. They therefore aim to close these knowledge gaps at this stage and support alignment with wider aspects of the adaptation plan for the region. A summary of these actions is provided in Table 8-5. These are designed to complement the wider Proactive Actions identified in the Regional CCAP.

Table 8-5: Local Proactive Actions

| Action | Details                                                                                                                   | Pillars                        |                                                                                       |
|--------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------|
| 1      | Review shingle recycling plan and investigate shingle beach enhancement in CMU 2 and locations with vulnerable core paths | Working with Natural Processes |    |
| 2      | Investigate opportunities for Inverbervie Caravan Park, and Beach Front car park re-location                              | Place Making                   |    |
| 3      | Investigate opportunities for re-alignment of core path south of Inverbervie                                              | Place Making                   |   |
| 4      | Establish coordinated and consistent beach monitoring plan for Natural coast                                              | Monitoring Change              |  |
| 5      | Adaptation and resilience workshop with local community and stakeholders                                                  | Community and Engagement       |  |
| 6      | Identify landownership and opportunities to support Make Space outcome policies                                           | Place Making                   |  |

| Action | Details                                                                                                           | Pillars                  |                                                                                     |
|--------|-------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------|
| 7      | Undertake critical third-party sector engagement to quantify wider economic impacts                               | Community and Engagement |  |
| 8      | Integrate future erosion projections into Local Development Planning to establish Coastal Change Management Areas | Place Making             |  |

## 9 Summary and Next Steps

### 9.1 Approach

This document presents the local CCAP for the Gourdon and Inverbervie CA. It is the first iteration and will be subject to ongoing review and update to effectively guide the adaptation process. The approach for developing the Plan makes use of available, national information on coastal flood and erosion risk and combines these with relevant local datasets.

Adaptation in Aberdeenshire has been steered by relevant published documentation and the Scottish Governments interim guidance on CCAPs. This has been simplified into four key pillars of adaptation:

1. **Working with Natural Processes**
2. **Monitoring Change**
3. **Community and Engagement**
4. **Climate Resilient Placemaking**

This local Plan builds on the Regional Plan by focusing on these pillars to develop an Adaptation Framework that can effectively support Gourdon and Inverbervie preparing for the impact that climate change will have on the coast. This will be delivered by following the Implementation Plan, presented here, that outlines triggers and associated actions to develop Adaptation Pathways and an Action Plan. This will happen when the process moves into Phase 1.

The following sections provide summaries of the key findings of this initial stage of the adaptation planning process.

### 9.2 Coastal Management Units and Risks

The Gourdon and Inverbervie CA was subdivided into six CMUs. For each of these a refined assessment was undertaken to determine coastal type and associated current and future flood and erosion risk. These are summarised as:

- CMU 1 - Natural with Risk
- CMU 2 - Hybrid with Risk
- CMU 3 - Hybrid with Risk
- CMU 4 - Natural with Risk
- CMU 5 - Defended with Risk
- CMU 6 - Defended with Risk

These were then taken forward to develop Adaptation Pathways and an Implementation Plan with Triggers and Actions associated with each CMU.

### 9.3 Adaptation Pathways

To enable effective implementation of this CCAP, each CMU has been assigned a generic Adaptation Pathway. This is specific to the CMU classification.

The adaptation journey is a multiphase, multiyear process and aims to transition communities into a more sustainable and resilient future. We are currently at **Phase 0**, meaning that no definitive preferred Adaptation Pathway and associated Action Plan have been developed. To move to **Phase 1** of the Adaptation Pathway, a trigger must be realised that results in New Assessment and a preferred pathway and associated Action Plan must be identified:

1. Phase 0:
  - Development of the Implementation Plan
  - Delivery of Phase 0 Actions
  - Delivery of Phase 0 Proactive Actions
2. Phase 1:
  - Implementation Plan outcomes:
    - Preferred Adaptation Pathway
    - Action Plan for delivery
  - Delivery of Phase 1 Proactive Actions
3. Phase 2+:
  - Implementation Plan outcomes:
    - Preferred Adaptation Pathway  
(Continue or revise Phase 1)
    - Action Plan for delivery  
(Continue or revise Phase 1)
  - Delivery of Phase 2 Proactive Actions

While ultimately the Adaptation Pathways have a desired outcome, what that looks like and how it will be reached cannot be defined at this stage. Effective monitoring against the set triggers will enable the CCAP to evolve through Phases and support Aberdeenshire Council decision making to aim to achieve this end-outcome.

## 9.4 Implementation Plan

The Implementation Plan was developed by defining Triggers and setting Actions against these. Implementation of the Plan will result in end outcomes that will ultimately influence the direction of the Adaptation Pathways.

At this stage the pathways do not result in definitive end points. Triggers, while tangible, provide markers whereby Aberdeenshire Council will undertake actions, guided by the Implementation Plan. The Outcomes of these however, are unknown and the elements of the pathway in the future therefore cannot be defined.

As well as Actions that rely on Triggers being realised. This initial stage of the adaptation planning process has identified several knowledge gaps and opportunities for activities to

be undertaken upfront. These are defined as Proactive, whereby undertaking these will only benefit and support Aberdeenshire's adaptation to coastal change.

In total, nine Proactive Actions have been set.

## 9.5 Next Steps

Adaptation to coastal change will be a continual journey and it is therefore important that the process is ongoing. Here, the following key steps require implementing by Aberdeenshire Council to support this journey and follow CCAP:

- Implement internal governance processes to review and monitor Triggers.
- Deliver local Phase 0 Actions.
- Deliver local Proactive Actions.

# A Defence Condition

## A.1 Gourdon and Inverbervie

| CMU | Defence ID<br>(line) | Beach type   | Structure Type               | Maintenance Regime | Grade | Deterioration Status (S/M/F) | Time to Grade Transition | Date of last assessment | Alert flag | Priority (Regime * grade) | Combination ID | Combo Priority | Flood zone (200yr+CC) | Erosion (2100) | Risk Score | Rank  |
|-----|----------------------|--------------|------------------------------|--------------------|-------|------------------------------|--------------------------|-------------------------|------------|---------------------------|----------------|----------------|-----------------------|----------------|------------|-------|
| 2   | IB01                 | shingle      | shingle revetment (baskets)  | 1                  | 4     | M                            | 2.5                      | 2025                    |            | 4                         |                |                | Y                     | Y              | 14.40      | 3.00  |
|     | IB02                 | shingle      | Rock Armour                  | 2                  | 2     | M                            | 7.5                      | 2025                    |            | 4                         | 1              | 4              | Y                     | Y              | 4.80       | 8.00  |
|     | IB02                 | shingle      | shingle revetment (under RA) | 1                  | 3     | M                            | 3.5                      | 2025                    |            | 3                         | 1              | 4              | Y                     | Y              | 10.29      | 4.00  |
|     | IB03                 | shingle      | Concrete mattress            | 2                  | 3     | M                            | 10                       | 2025                    |            | 6                         |                |                |                       | Y              | 4.50       | 9.00  |
| 3   | IB04                 | shingle      | Rock armour                  | 2                  | 4     | M                            | 5                        | 2025                    | x          | 8                         |                |                |                       | Y              | 18.00      | 2.00  |
|     | IB05                 | shingle      | Vertical wall                | 2                  | 2     | M                            | 12.5                     | 2025                    |            | 4                         |                |                | Y                     | Y              | 2.88       | 10.00 |
|     | IB06                 | shingle      | Shingle revetment            | 2                  | 3     | M                            | 10                       | 2025                    |            | 6                         |                |                | Y                     | Y              | 5.40       | 5.00  |
| 5   | GD01                 | shingle      | Vertical wall                | 2                  | 5     | M                            | 0                        | 2025                    | x          | 10                        |                |                | Y                     |                | 90.00      | 1.00  |
|     | GD02                 | shingle/rock | Brick outer break wall       | 3                  | 2     | M                            | 15                       | 2025                    |            | 6                         |                |                | Y                     |                | 2.40       | 12.00 |
| 6   | GD03                 | shingle/rock | Brick outer break wall       | 3                  | 2     | M                            | 15                       | 2025                    |            | 6                         |                |                | Y                     |                | 2.40       | 11.00 |
|     | GD04                 | shingle      | Rock armour                  | 2                  | 3     | M                            | 7.5                      | 2025                    |            | 6                         |                |                | Y                     |                | 4.80       | 7.00  |
|     | GD05                 | shingle      | Vertical wall                | 2                  | 3     | M                            | 7.5                      | 2025                    |            | 6                         |                |                | Y                     |                | 4.80       | 6.00  |

## A.2 Selected defence survey photographs

| Defence ID | Maintenance Regime                                                                   | Grade | Protection type                          |
|------------|--------------------------------------------------------------------------------------|-------|------------------------------------------|
| IB01       | 1                                                                                    | 4     | Shingle Revetment (baskets)              |
|            |    |       |                                          |
| IB02       | 2(1)                                                                                 | 2(3)  | Rock Armour (shingle revetment under RA) |
|            |  |       |                                          |
| IB04       | 2                                                                                    | 4     | Rock Armour                              |

| Defence ID | Maintenance Regime                                                                  | Grade | Protection type |
|------------|-------------------------------------------------------------------------------------|-------|-----------------|
|            |   |       |                 |
| GD01       | 2                                                                                   | 5     | Vertical Wall   |
|            |  |       |                 |

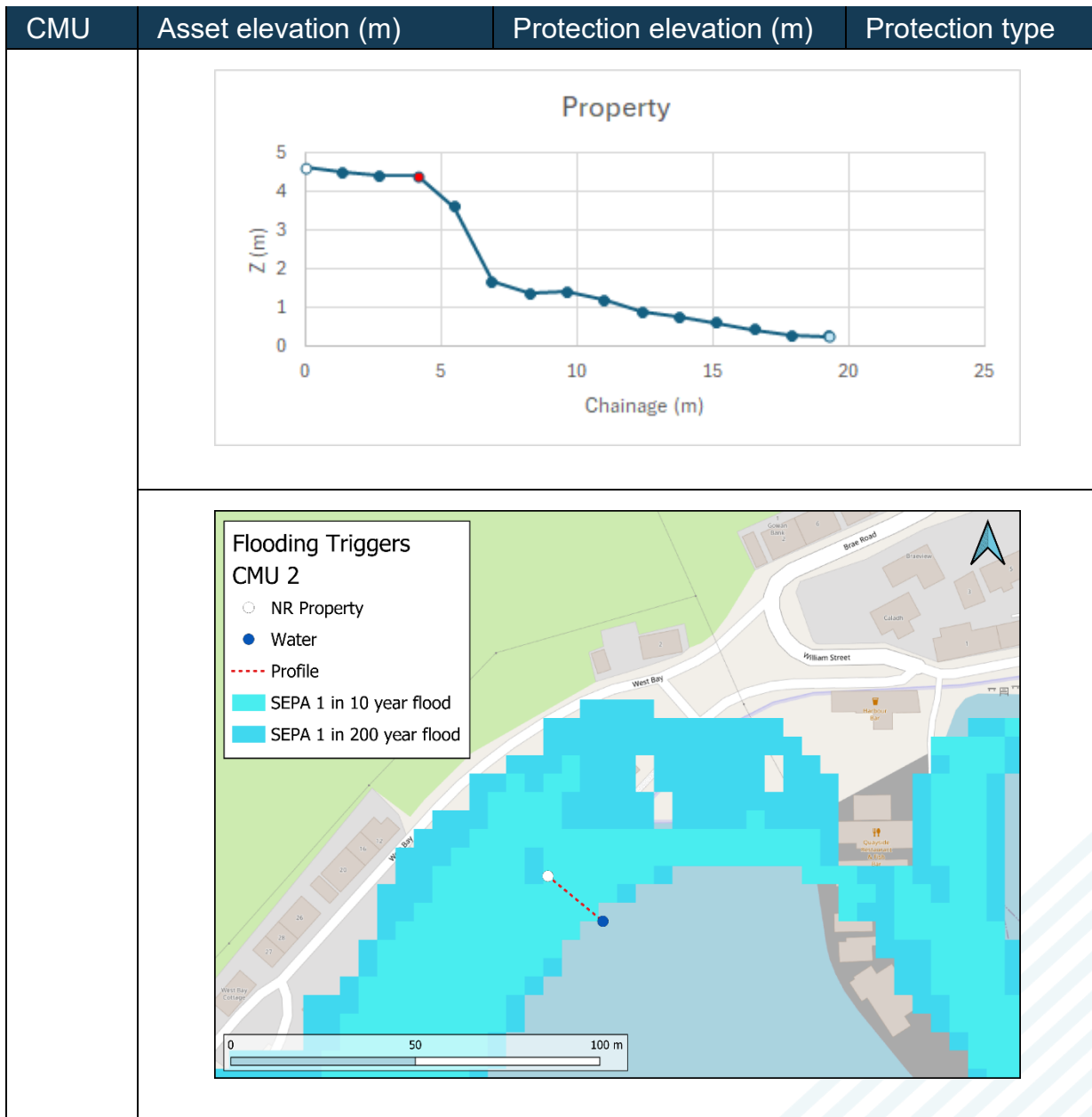
## B Triggers

### B.1 Flooding Trigger Profiles

Table 9-1: CMU flooding trigger profiles. Showing elevation for asset at risk and any natural or artificial protection, represented by a red dot.

| CMU                                                                                                                                                                                                                                                                                                                                                                                             | Asset elevation (m) | Protection elevation (m) | Protection type                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------|--------------------------------------------|
| 2                                                                                                                                                                                                                                                                                                                                                                                               | 7.2                 | 6                        | Rock armour                                |
| <div data-bbox="379 566 1291 1093"> <p><b>Property</b></p> <p>Y-axis: Z (m) from 0 to 8. X-axis: Chainage (m) from 0 to 45.</p> </div> <div data-bbox="379 1160 1291 1800"> <p><b>Flooding Triggers CMU1</b></p> <ul style="list-style-type: none"> <li>○ R Property</li> <li>● Water</li> <li>--- Profile</li> <li>SEPA 1 in 10 year flood</li> <li>SEPA 1 in 200 year flood</li> </ul> </div> |                     |                          |                                            |
| 5                                                                                                                                                                                                                                                                                                                                                                                               | 3.4                 | 3.4 (wall)               | Shingle/<br>Concrete wall<br>(at property) |

| CMU          | Asset elevation (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Protection elevation (m) | Protection type                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------|--------------|-------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|              | <div><p>Property</p><table><thead><tr><th>Chainage (m)</th><th>Z (m)</th></tr></thead><tbody><tr><td>0</td><td>3.4</td></tr><tr><td>1.2</td><td>3.2</td></tr><tr><td>2.5</td><td>3.0</td></tr><tr><td>3.8</td><td>2.8</td></tr><tr><td>4.8</td><td>2.7</td></tr><tr><td>6.2</td><td>2.5</td></tr><tr><td>7.5</td><td>2.3</td></tr><tr><td>8.5</td><td>2.1</td></tr></tbody></table></div> <div><p><b>Flooding Triggers CMU2</b></p><ul style="list-style-type: none"><li>○ R Property</li><li>● Water</li><li>--- Profile</li><li>SEPA 1 in 10 year flood</li><li>SEPA 1 in 200 year flood</li></ul></div> |                          |                                | Chainage (m) | Z (m) | 0 | 3.4 | 1.2 | 3.2 | 2.5 | 3.0 | 3.8 | 2.8 | 4.8 | 2.7 | 6.2 | 2.5 | 7.5 | 2.3 | 8.5 | 2.1 |
| Chainage (m) | Z (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                          |                                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 0            | 3.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 1.2          | 3.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2.5          | 3.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 3.8          | 2.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 4.8          | 2.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 6.2          | 2.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 7.5          | 2.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 8.5          | 2.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                                |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 6            | 4.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4.4                      | concrete wall /<br>rock armour |              |       |   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |



## B.2 Erosion Trigger Profiles

Table 9-2: Gourdon and Inverbervie erosion triggers.

| CMU | Asset     | Trigger Met | Erosion Trigger                                                                                                                                   |
|-----|-----------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 2   | RP        | No          | <p><b>Triggers CMU 2</b></p> <ul style="list-style-type: none"> <li>Erosion 1</li> <li>Erosion 2</li> <li>Property</li> <li>Coastline</li> </ul>  |
| 3   | Core path | No          | <p><b>Triggers CMU 3</b></p> <ul style="list-style-type: none"> <li>Erosion 1</li> <li>Erosion 2</li> <li>Core path</li> <li>Coastline</li> </ul> |
| 4   | RP        | No          | <p><b>Triggers CMU 4</b></p> <ul style="list-style-type: none"> <li>Erosion 1</li> <li>Erosion 2</li> <li>Property</li> <li>Coastline</li> </ul>  |

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