The Highland Council
Comhairle na Gàidhealtachd

Highland Council Regional Coastal Change Adaptation Plan

www.highland.gov.uk

REVISION STATUS INDICATOR AND DISTRIBUTION

This document was prepared as follows: -

	Name
Outline Prepared By	S Veitch
Final Prepared By	Susan Veitch
Approved By	Alan Fraser

and revised as follows: -

REVISION STATUS INDICATOR

Page No	Date	Revision	Description of Change	Initial

EXECUTIVE SUMMARY

This Regional Coastal Change Adaptation Plan (RCCAP) provides an overview of assets at risk within The Highland Council area, in relation to climate change, sea level rise, changing coastal process and flood risk now and in the future. It has been developed using available national datasets from The Highland Council, SEPA and Dynamic Coast Project. The plan has been developed in line with the available Scottish Government guidance and other Highland Council plans.

The RCCAP is an overarching look at the whole of The Highland Council Coastline, identifying approximately 1765 assets within 1km of the coastline. Of these 617 are at risk from erosion, increased flood risk or both and will either be within the eroded area or within 10m of the eroded area by 2050.

This RCCAP identifies those areas most vulnerable to Climate Change, coastal erosion and increased coastal flooding by 2050. Local coastal adaptation plans (LCCAPs) will then be developed for the coastal areas where adaptation actions are considered a high priority. It is envisaged that these documents will be living documents and continue to be developed as our understanding of the risks improve. They will provide a mechanism to engage with affected communities, enabling them to input into their future resilience.

The report provides a framework towards an adaptive approach to increased sea level rise, coastal erosion and coastal flood risk associated with climate change. The report identifies policies which can provide both short and long-term actions, trigger points for change and an adaptive framework to enable our coastal communities to take actions to develop resilience and/or adaptation measures over time, enabling them to manage the impacts of climate change. This approach will reduce the risk of future generations being locked into expensive and unsustainable options in future, such as coastal defences, development in in-appropriate locations, whilst providing them with the tools to manage the risk to their communities in the future.

The Highland Council will require to engage meaningfully with communities and other stakeholders, to enable their involvement in developing an adaptive and resilient approach to climate change, increased sea level rise, coastal erosion and flood risk.

Contents

LIST OF FIGURES iv

LIST OF TABLES iv

Abbreviations v

Chapter 1 – Introduction 1

1.1 What is a Coastal Change Adaptation Plan (CCAP)? 1

1.2 Why is it needed? 2

1.3 Regional Coastal Change Adaptation Plan (RCCAP) 2

Chapter 2 – Links to Supporting Plans and Projects 4

2.1 National 4

2.1.1 National Planning Framework 4 (NPF4) 4

2.1.2 The Planning (Scotland) Act 2019 4

2.1.3 The Climate Change (Scotland) Act 2009 5

2.1.4 Scottish National Adaptation Plan (SNAP) 2024 – 2029 5

2.1.5 The Flood Risk Management (Scotland) Act 2009 5

2.2 Local 5

2.2.1 Highland Wide Local Development Plan (HWLDP) 5

2.2.2 Local Flood Risk Management Plans 5

2.2.3 Local Biodiversity Action Plan 6

2.2.4 The Highland Council Net Zero Strategy. 6

2.2.5 Communications Strategy 6

2.3. Other Relevant Guidance/Plans 6

2.3.1. Dynamic Coast 2021 6

2.3.2. Scottish Government Coastal Change Adaptation Plan (CCAP) Interim Guidance 6

2.3.3. Marine National Plan 7

2.3.4. Marine Regional Plans 7

2.3.5. River Basin Management Plan 7

Chapter 3 – Adaptation Planning 8

3.1 What is adaptation planning 8

3.2 Dynamic pathways approach 8

3.3 Triggers 9

3.4 Action 10

Chapter 4 – Regional plan overview 11

4.1 Coastal cells and sub-cells 11

4.2 Coastal segments 13
4.3 Coastal erosion, sea level rise (SLR) and increased flood risk 18
4.3.1 Erosion 18
4.3.2 Mean Sea level rise, increased flood risk and tidal change 18
4.4 Methodology for reviewing segment numbers 19
4.4.1 Data review 20
4.4 Summarise methodology for final results 25
4.5 Most at-risk locations 25
4.6 Uncertainty 27
Chapter 5 Next Steps 29
5.1 Local coastal change adaptation plans (LCCAPs) 29
5.2 Required resources 29
Appendix 1 28

LIST OF FIGURES

Figure 1: Replicated from Dynamic Adaptive Pathway (JBA) 9
Figure 2: Highland Council Coastal Cells 12
Figure 3: Coastal sub-cells 13
Figure 4: Coastal Segments 14
Figure 5: Coastal Erosion Zones 18
Figure 6: (617) Segments assets at risk all source 21
Figure 7: (192) Segments with assets at erosion risk 22
Figure 8: (568) Segments with assets at flood risk 23
Figure 9: Segments/Locations scoring 30 or more 27

LIST OF TABLES

Table 1:Coastal Classification 15
Table 2: Assets within 1km of Coastline 17
Table 3: Predicted Sea Level Rise by 2100 19
Table 4: Scoring Matrix 24
Table 5: High Risk Locations Total Score 25
Table 6: Additional Locations Justification ..... **Error! Bookmark not defined.**

Abbreviations

BTLFLD	Battlefield
CCAP	Coastal change adaptation plan
COMSER	Consumer asset
CZC	Coastal zone classification
EA	Erosion area
EI	Erosion influence
EV	Erosion Vicinity
FRMA	The Flood Risk Management (Scotland) Act 2009
FRMPs	Flood risk management plan
GDL	Garden & designated landscape
H	High
HNBAP	The Highland Council National biodiversity action plan
HWLDP	Highland wide local development plan
LCCAP	Local coastal change adaptation plan
M	Medium
Mcc	Medium with Climate Change
MHWS	Mean high water spring
MLWS	Mean low water spring
NCMPA	National conservation marine protection areas
NNR	National nature reserve
N-RP	Non-residential property
PIC	Properties in care
RBMP	River Basin management plan
RCCAP	Regional coastal change adaptation plan
RP	Residential property
SAC	Special area of conservation
SEPA	Scottish Environment Protection agency
SHDMN	Scheduled monuments
SLR	Sea level rise
SNAP	Scottish national adaptation plan
SPA	Special protection area
SSSI	Site of special scientific interest
UKCP	United Kingdom climate projections
UTIL	Utilities

Chapter 1 – Introduction

The Highland Council has undertaken a Regional Coastal Change Adaptation Plan (RCCAP) in line with the interim guidance provided by the Scottish Government[1]. The plan identifies the number of assets currently at risk within The Highland Council coastal boundary, developing a scoring system to identify the most at-risk areas, which will help to focus Local Coastal Change Adaptation Plans as resources become available. The plan recommends an adaptive approach to coastal change, which will enable short term action to allow our coastal communities to develop resilience to coastal change over time. This will reduce the risk of future generations being locked into expensive and unsustainable options, such as coastal defences or development in in-appropriate locations, whilst providing them with the tools to become more resilient. As such this regional plan and consequential local plans are a fundamental part of delivering the adaptation actions which fall from the Highland Council's statutory duties under the Climate Change (Scotland) Act, 2009.

1.1 What is a Coastal Change Adaptation Plan (CCAP)?

A Coastal Change Adaptation Plan (CCAP) is designed to consolidate our understanding of the hazards and risks that are associated with a changing climate and coastline, within The Highland Council area. It will enable The Highland Council to set out a proactive approach to promote and support resilience of our coastal communities, businesses, economy as well as our historical and natural environment. By assessing and monitoring what is currently happening around our coastline, resilience actions can be built in now to futureproof our coastal communities, infrastructure, and environment.

The CCAP will consider all the potential current pressures on the coast, including erosion, accelerating relative sea levels, flooding, aging coastal defences, land use, as well as environmental and ecological pressures. The plan will provide an effective way to engage with coastal communities and other external stakeholders to help raise awareness of those issues and develop an acceptable strategy going forward.

The CCAP recognises the inherent and unavoidable uncertainty surrounding the current scientific data and anticipated change due to weather events, but acknowledges that although there is some uncertainty, changes are already occurring around the Highland coastline. This plan acknowledges that a 'business as usual' approach will fail under climate change. By developing a framework to implement an dynamic adaptive approach to coastal change, it will ensure that future generations are best placed to be more resilient to change within their communities and reduce the likelihood of being locked into unsustainable and uneconomic practices long term.

[1] Scottish Government (2023) Coastal Change Adaptation Plan Guidance – Interim https://www.dynamiccoast.com/files/ccapg_2023feb.pdf

1.2 Why is it needed?

The World's climate is changing. Evidence has shown since the 1800's, that human activity has influenced global warming, resulting in an enhanced warming of the atmosphere and oceans. This has led to a decrease in snow and ice extents and an increase in sea level globally. Further information on Climate Change can be found at http://ukclimateprojections.metoffice.gov.uk/.

The Highland Council Net Zero Strategy sets out the Council's approach to addressing the climate emergency and contributes towards Scotland's national legally binding target to become Net Zero by 2045. Further details can be found at Net Zero Strategy | (highland.gov.uk). This plan, and other adaptation plans complement the wider mitigation efforts. But they are essential to address coastal change which is one of Scotland's most severe climate risks (Committee on Climate Change, 2022).

Within The Highland Council area, the coastal zone is home to much of the population, and contains significant infrastructure such as roads, railway lines, bridges, harbours etc. These coastal areas help to drive the economy within the Council area and as such a more adaptive approach is required to ensure our communities and infrastructure remain resilient in the future. The regional CCAP will provide an overview of the risks across The Highland Council coastal area, identifying locations and infrastructure that are least resilient to climate change and rising sea levels, providing a framework and flexible approach to address these risks over time.

The impact of coastal change and risk will vary across the Highland area, depending on several factors including physical factors such as geology, existing manmade or natural defences, as well as societal factors, such as demographics and social vulnerability.

1.3 Regional Coastal Change Adaptation Plan (RCCAP)

The RCCAP is an overarching plan that covers the whole of the Highland Coastline, providing an understanding of:

- Coastal erosion and flood risk using the best available data.
- Identify Influencing Factors and Indicators across the coastal area that will inform and support an adaptive planning process.
- Consider region wide Triggers that will influence the adaptive planning process.
- Set coastal wide Actions to support more adaptive and resilient coastal communities within the Highland area.

The Plan provides a framework for The Highland Council to support coastal communities in adaptation and resilience planning across the coastal area. It should be adaptive and sufficiently precautionary to changing risks, whilst considering current and future opportunities to make coastal communities more resilient to future change. The plan should underpin local development plans and steer future development away

from risk, whilst safeguarding locations that could provide for opportunities such as asset relocation or space for coastal retreat.

Chapter 2 – Links to Supporting Plans and Projects

2.1 National

2.1.1 National Planning Framework 4 (NPF4)

NPF4[2] was adopted by Scottish Ministers on 13 February 2023 when it became part of the Development Plan replacing NPF3 and Scottish Planning Policy. It sets out a long-term plan for Scotland, identifying where national developments and infrastructure is needed to support sustainable and inclusive growth.

This RCCAP will help support the delivery of the following policies within NPF4:

Policy 1: Sustainable Places: Tackling the climate and nature crisis by encouraging, promoting and facilitating development that addresses the global climate emergency and nature crisis. Ensuring adaptation for current and future risks of climate change.

Policy 2: Climate mitigation and adaptation – development proposals will be sited and designed to adapt to current and future risks from climate change. Ensuring our places are more resilient to climate change impacts.

Policy 10: Coastal Development – To protect coastal communities and assets and support resilience to the impacts of climate change. A precautionary approach should be taken to development at the coast and include opportunities to use nature-based solutions to improve the resilience of coastal communities and assets.

Policy 14 – Liveable Places: Design, quality and place – supporting the efficient use of resources that will allow people to live, play, work and stay in their area, ensuring climate resilience, and integrating nature positive, biodiversity solutions. Liveable places that are adaptable allowing for flexibility so that they can be changed to quickly accommodate different uses as well as maintained over time.

Policy 22 – Flood risk and water management: to strengthen resilience to flood risk from all sources by promoting avoidance as a first principle in reducing the vulnerability of existing and future development to flooding.

The RCCAP should support the development of Local Place Plans[3], led by communities, setting out their proposals for future development and land use within their community. These community driven Local Place Plans will help inform The Highland Council's future Highland Wide Local Development plan.

2.1.2 The Planning (Scotland) Act 2019

The Planning (Scotland) Act 2019 was passed by Scottish Parliament in June 2019. The Act[4] is designed to enable communities to influence future development within their areas, whilst enabling the planning system to tackle the climate emergency.

[2] National Planning Framework 4 - gov.scot (www.gov.scot)
[3] https://www.highland.gov.uk/info/178/development_plans/1043/local_place_plan
[4] http://www.legislation.gov.uk/asp/2019/13/contents/enacted

2.1.3 The Climate Change (Scotland) Act 2009

The Climate Change (Scotland) Act 2009 places duties on the public sector for climate mitigation and adaptation to impacts of climate change[5].

2.1.4 Scottish National Adaptation Plan (SNAP) 2024 – 2029

The SNAP 2024 -2029[6] was published in September 2024 replacing SCCAP 2019 – 2024. This plan sets the direction of travel for the Government to reduce emissions, and the take steps required to adapt to climate change. The RCCAP will help towards achieving the outcomes set out in SNAP 2024-2029 in particular:

Outcome 1: Nature connects across land, coast and sea

Outcome 2: Communities are climate friendly, healthy, and fair

Outcome 3: Public Services are working together to adapt

2.1.5 The Flood Risk Management (Scotland) Act 2009

The Flood Risk Management (Scotland) Act 2009[7] (FRMA) sets out a process for delivering a plan-led, risk-based approach to managing flood risk from all sources in a sustainable way. The information provided at a national level through 14 Flood Risk Management Plans, helps target investment and co-ordination to manage flood risk at a local level.

2.2 Local

2.2.1 Highland Wide Local Development Plan (HWLDP) [8]

- Policy 49 Coastal Development -The site should not be at risk from coastal erosion or flooding or cause unacceptable impact as a result of natural coastal processes which it triggers or accentuates.
- Policy 64 Flood Risk - Development proposals should avoid areas susceptible to flooding and promote sustainable flood management.

The Flood Risk Management Plans (FRMPs) and Local Flood Risk Management Plans (LFRMPs), alongside the CCAP should be used to enable appropriate decisions to be made on where future coastal development should and should not be located. By doing so, the Local Development Plan can help safeguard natural features, including those that protect coastal communities and other assets. The Planning authority may require to identify locations where assets/infrastructure could be relocated, if protection from coastal erosion and flooding is not possible or no longer sustainable.

2.2.2 Local Flood Risk Management Plans

Local FRM Plans are important resource in responding to increased flood risk from Climate Change and a mechanism to help make communities more resilient. The

[5] Climate Change (Scotland) Act 2009 (legislation.gov.uk)
[6] Climate change - national adaptation plan 2024 to 2029: consultation - gov.scot (www.gov.scot)
[7] Flood Risk Management (Scotland) Act 2009 (legislation.gov.uk)
[8] Highland-wide Local Development Plan | Highland-wide Local Development Plan | The Highland Council

Highland Council area is represented within two Local Flood Risk Management Districts.

- Findhorn, Nairn and Speyside Local Plan District[9]
- Highland and Argyll Local Plan District[10]

The RCCAP and Local coastal adaptation plan will help to deliver some of the actions in relation to coastal flood risk, resilience, and adaptation within these Local Flood Risk Management Districts.

2.2.3 Local Biodiversity Action Plan

The Highland Nature Biodiversity Action Plan (HNBAP)[11] details priority species and habitats within the Highland region that must be considered within any development assessment and within biodiversity enhancement measures.

2.2.4 The Highland Council Net Zero Strategy[12].

The Highland Councils Net Zero Strategy sets out the Council's approach to addressing the climate emergency by reducing our emissions and preparing for the unavoidable impacts of climate change. It provides a framework to reduce emissions and make The Highland Council area more resilient to the climate change and ecological emergency.

2.2.5 Communications Strategy13

The Regional CCAP will be used to help to engage coastal communities to enable them to respond to the climate and ecological emergencies to help them adapt and become more resilient to future risks.

2.3. Other Relevant Guidance/Plans

2.3.1. Dynamic Coast 2021[14]

Dynamic Coast 2021 was commissioned to provide a strategic evidence base on extent of erosion within Scotland. It is intended to provide an indication of the highest risk locations within Scotland and support decision making towards adaptation and resilience along the coastline.

2.3.2. Scottish Government Coastal Change Adaptation Plan (CCAP) Interim Guidance[15]

This guidance has been developed to support local authorities in the preparation of Coastal Change Adaptation Plans.

[9] Flood Risk Management Plan | Findhorn, Nairn and Speyside Final Report November 2022 (highland.gov.uk)
[10] Flood Risk Management Plan | Highland & Argyll LFRMP (Cycle 2) Dec 2022
[11] Highland Nature Biodiversity Action Plan 2021 to 2026 |
[12] Net Zero Strategy | (highland.gov.uk)
[13] Performance and communication | Communications and Engagement Strategy 2024-27 (highland.gov.uk)
[14] Dynamic Coast - Coastal Erosion in Scotland | CREW | Scotland's Centre of Expertise for Waters
[15] Scottish Government (2023) Coastal Change Adaptation Plan Guidance – Interim https://www.dynamiccoast.com/files/ccapg_2023feb.pdf

2.3.3. Marine National Plan[16]

The Marine National Plan provides a framework for managing all developments, activities and interests in or affecting Scotland's Marine area (territorial & offshore waters).

2.3.4. Marine Regional Plans[17]

CCAPs will provide important detail, both more locally and regarding future change, to support marine planning approaches.

2.3.5. River Basin Management Plan[18]

The RBMP sets out a framework for protecting and improving the water environment across Scotland. This includes lochs, estuaries, coastal estuaries to help support fisheries, essential resources, provide a source of recreation to promote health and well-being.

[16] Scotland's National Marine Plan - gov.scot (www.gov.scot)
[17] Regional marine plans and legislation - gov.scot (www.gov.scot)
[18] 211222-final-rbmp3-scotland.pdf (sepa.org.uk)

Chapter 3 – Adaptation Planning

3.1 What is adaptation planning

Adaptation planning provides an iterative, flexible approach to managing the impacts of projected climate change around our coastline, whilst recognising the uncertainty surrounding current knowledge and data gaps. An adaptation plan approach enables actions to be undertaken in the short-term to manage current risks, whilst developing longer-term more sustainable options, these approaches use dynamic pathways which can be adapted to reflect changing knowledge and information as it becomes available but also changes in events[19]. To reduce the current uncertainty, data collection, monitoring and reviewing information is essential, this will enable the long-term goals of establishing sustainable, adaptive and resilient coastal communities within The Highland Council area.

3.2 Dynamic pathways approach

Not all future risks have to be addressed immediately. By using a dynamic pathways approach it provides an opportunity to be flexible and review decisions based on new information or data which improves understanding regarding risk, but also the implications of changing weather patterns . A number of pathways may be defined at the outset of a project, with one considered the preferred approach, whilst recognising other potential pathways exist. By having more than one potential pathway it provides flexibility to adapt to future change. JBA provided a sketch of the Dynamic Adaptive Pathway (November 2023, pg. 11) and this is included in Figure 1 below:

[19] Scottish Government (2023) Coastal Change Adaptation Plan Guidance – Interim https://www.dynamiccoast.com/files/ccapg_2023feb.pdf

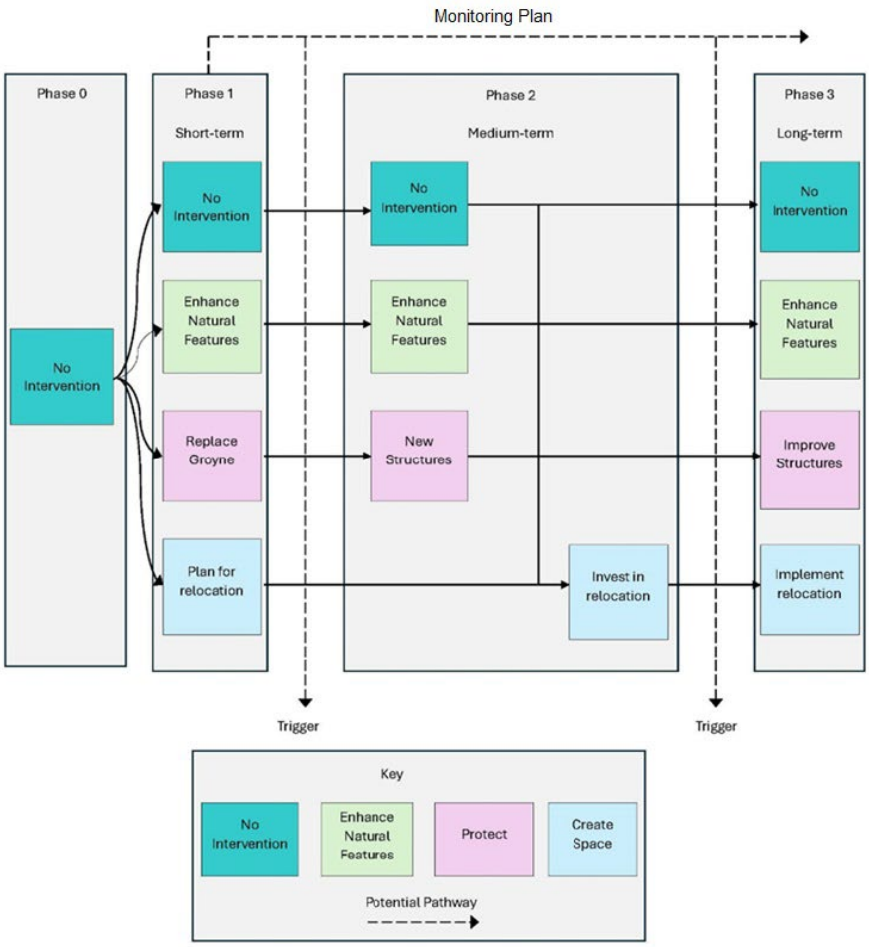

Figure 1: Replicated from Dynamic Adaptive Pathway (JBA)[20]

3.3 Triggers

In order to keep the information within the RCCAP relevant and accurate, triggers should be considered, such that when a trigger occurs, consideration should be given to review the information within the regional plan.

At a regional scale triggers can be considered to fall into 4 categories:

1. Change to available data and information, this may include the following:
    a. Improved Highland Council data
    b. Dynamic coast updates
    c. NFRA assessment updates
    d. SEPA updated Coastal Maps
2. Improved science
3. Change to guidance, supporting documentation, legislation this may include the following:
    a. Updated Government CCAP guidance
    b. New legislative requirements
    c. The Highland Council LDP updates
    d. UKCP climate change updates

[20] Replicated from Fig 2-2 Dynamic Adaptive Pathways Report (The Highland Council), Nov 2023 (JBA consulting)

4. Funding streams
    a. Additional funding becomes available from Scottish Govt.
    b. Funding from external stakeholders

In order to keep the regional plan relevant, it is important to continue to monitor, collect data and undertake a review of the plan when a trigger has been reached. By undertaking a review of the document and adaptive pathway the Council is currently on, it will ensure the report remains relevant and resources are being directed at those locations where assets are at most risk.

3.4 Action

The RCCAP is intended to remain a living document and in order to ensure the information remains relevant a number of actions at the regional level are required.

1. Monitor change along the coastline at a regional scale in order to improve data and reduce uncertainties associated with currently available data.
2. Review the regional CCAP in line with any new information, data, guidance or legislation. At a minimum should be reviewed every 6 years in line with the Local FRM Plan cycles.
3. Review the prioritised list and update as required to ensure that the highest risk areas are being targeted.
4. Review the impact on any Local Coastal Adaptation Plans.
5. Continue to work with and share information with external stakeholders.
6. Raise awareness amongst at risk communities.

Chapter 4 – Regional plan overview

The Highland Council RCCAP has been developed using the best available published data from Dynamic Coast and SEPA, supplemented with local information where available. This report acknowledges that additional data may become available, and such updates will be considered and where relevant incorporated into the local CCAPs.

4.1 Coastal cells and sub-cells

Scotland's coastline has been divided into cells and sub-cells, allowing the coast to be partitioned into separate areas for management purposes[21]. The cells have been identified based on the natural processes that define the area, the longshore drift, and the movement of sediment such as sand and gravel within them such that there is no nett import or export of sediment within a cell.

As each cell can be considered distinct in its natural process, it is unlikely to be influenced by the processes of an adjacent cell. For instance, installation of an artificial defence in cell 3 is unlikely to impact cell 2. However, if the sediment supply is disrupted within a cell, then it can impact other coastal locations within that cell.

The Highland Council coastline falls into 3 cells:

Cell 3 – Cairnbulg Point (East of Fraserburgh) to Duncansby Head – Typically the east coast is more developed than the North or West coast, especially along the A96/A9 corridor. It is characterised by softer low-lying coastline especially along the estuaries of the inner Moray Firth, before towns and villages become more contained between the rising hills and coast from Brora northwards.

Cell 4 – Duncansby Head to Cape Wrath – The north coast is less populated than either the East or West, being more exposed to the elements. It transitions from a more level and uniform landscape around Thurso in the west, to the more indented Lochs and steep cliffs as you move west to Dunnet Head.

Cell 5 – Cape Wrath to Mull of Galloway – much of the West Coast is characterised by mountains, rugged headlands and sea lochs leading to less development than on the East Coast.

The cells are depicted in Figure 2: Highland Council Coastal Cells, using the information from Dynamic Coast advanced webmap[22]. It is acknowledged that Cell 3 and 5 overlap with neighbouring authorities and where LCCAPs are developed for these locations, liaison will be undertaken with the relevant local authority.

[21] Ramsey & Brampton, 2000 – see link https://www.dynamiccoast.com/resources
[22] DC2 Advanced WebMap (arcgis.com)

Figure 2: Highland Council Coastal Cells

Some cells such as cell 3 & 5 are further sub-divided into sub-cells. This usually occurs where internal characteristics of the cell vary such as the geology or physical characteristics including indented coves or bays, estuaries, cliff areas which may impact the hydraulic environment and orientation affecting the longshore drift within the main cell. These sub-cells are shown in Figure 3: Coastal sub-cells below, using the data available from Dynamic Coast advanced webmap[23].

[23] DC2 Advanced WebMap (arcgis.com)

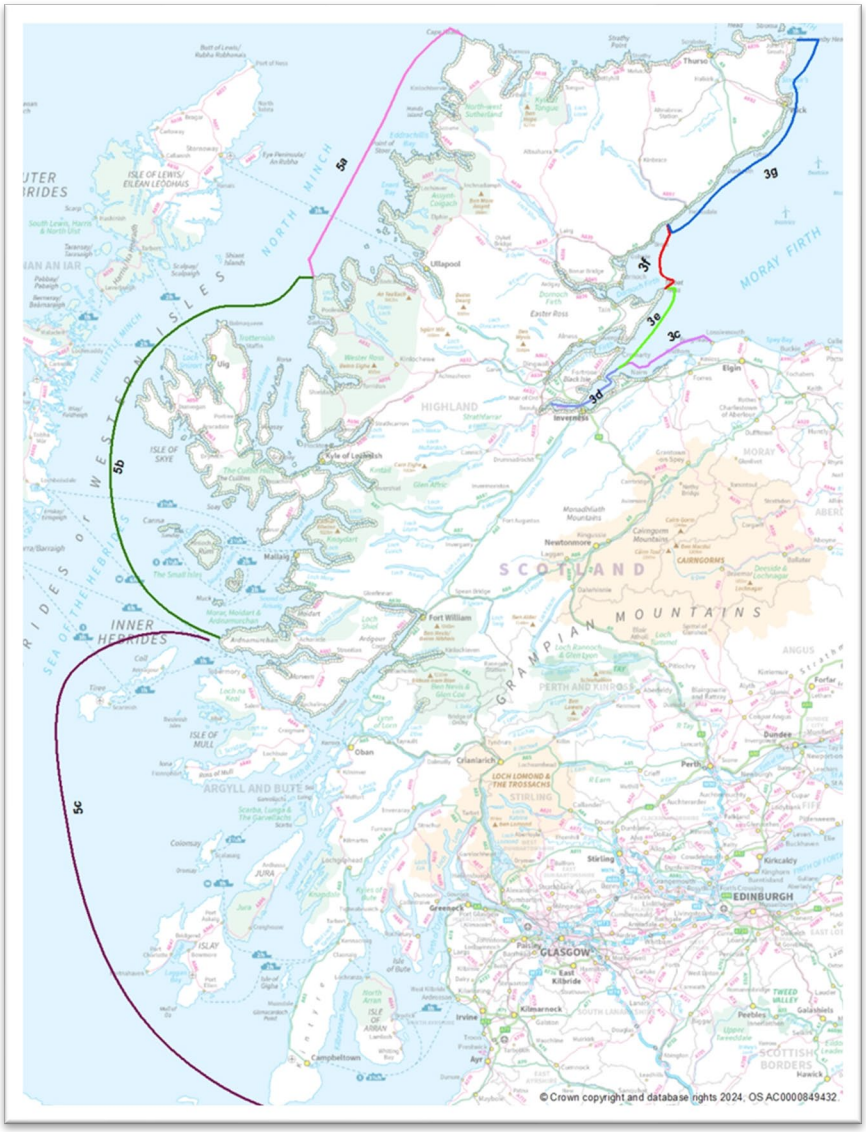

Figure 3: Coastal sub-cells

4.2 Coastal segments

To develop the plan, the Coastal Zone Classification (CZC) developed by Dynamic Coast was used to appraise clustering of assets around the Highland coastline. This data comprises of a series of coastal segments that are approximately 1km^2 in size, with each segment extending 1km inland, from current mean high-water spring (MHWS). 2557 of these1km long segments cover the Highland area, see Figure 4: Coastal Segments.

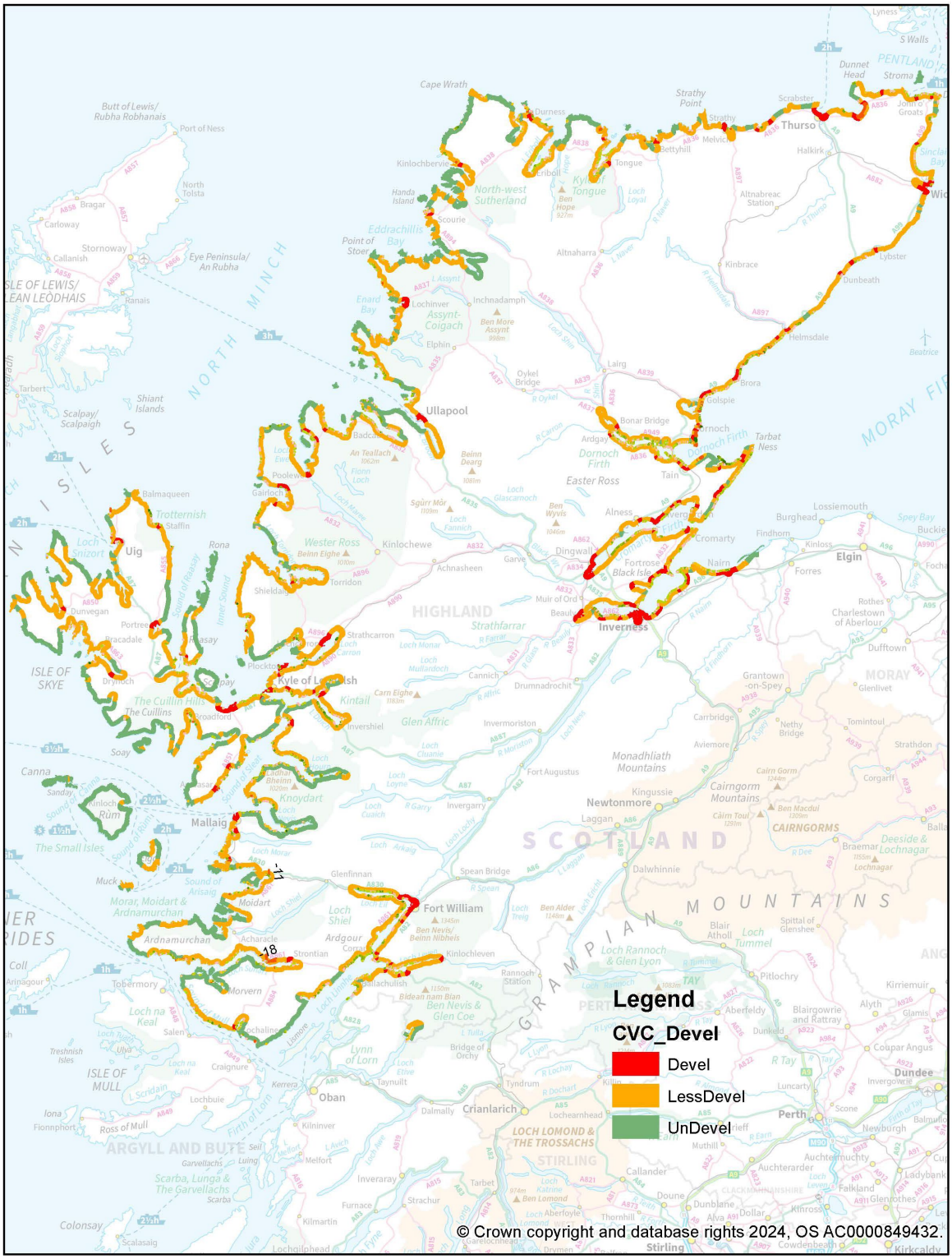

Figure 4: Coastal Segments

Each of these segments report the number, length, or area of certain assets within them (e.g. roads, rail, property, special areas of conservations (SAC)). The coastal area was then classified into Developed, Less Developed and Undeveloped to focus on locations where loss of assets could be most detrimental to coastal communities see table 1.

Table 1:Coastal Classification

Classification	Criteria
Developed	Total number of residential and non-residential properties is greater than 50
Less Developed	Total number of residential and non-residential properties is greater than 10 but less than 50, or there are road, rail or water pipes present.
Undeveloped	Total number of residential and non-residential properties is less than or equal to 10.

The classification system recognises that the more developed the location the more assets are likely to be at risk from the impacts of climate change and the more people could be impacted. An area classified as developed will have more than 50 properties (per km^2) at risk, compared to an undeveloped location with less than 10 (per km^2), the higher the number at risk the more substantial the impact could be.

It is recognised that not all assets recorded within individual segments are owned or maintained by The Highland Council, and therefore it will require The Highland Council to work with partners and external stakeholders, whose assets are also at risk. For example, paths linking communities, or key tourism assets (such as golf courses).

The regional plan should also provide a mechanism to open discussions with coastal communities. The plan recognises the commitment by The Highland Council to ensure communities have their say in shaping their environment for the future, through Local Place Plans, which will be considered within the new Local Development Plans currently under preparation.

It also recognises the uncertainties that surround Climate Change and timeframes but acknowledges that change is occurring around the coastline. Impacts of recent storms (see Dynamic Coast's erosion reporter[24]) in The Highland Council area have highlighted how vulnerable some locations are, impacting on roads, damaging existing defences and natural dune systems, exposing communities and assets to increasing risk of erosion and flooding.

As the effect of Climate Change continues to grow, many of these coastal communities and assets will face increased risk from sea level rise (SLR), coastal erosion and associated flood risk. A breakdown of the asset type is included within Table 2: Assets within 1km of Coastline, some cells will contain more than 1 asset type and number e.g rail, road and/or several properties. For example, there are 61,455 residential properties within 1km of the coast within Highland. These are located within 54% of

[24] Coastal Erosion Survey Results

the Highland coast as 1,391 of the 2557 coastal segments across the area have residential property.

Table 2: Assets within 1km of Coastline

Asset Type	Quantity within 1km of coast	Contained in No. Segments	% of all Segments
Total number of coastal segments in the THC area		2557	100%
Residential Properties (number)	61,455	1391	54%
Non-Residential Properties (number)	18,472	1249	49%
Residential & Non-Residential Properties	79,927	1456	57%
Road length (m)	205,854	1589	62%
Rail length (m)	238,900	212	8%
Runway (m2)	181,589	5	0.2%
Waste Water Supply network (m)	1,233,317	354	14%
Waste Water Asset (number)	354	354	14%
Clean Water Supply network (m)	974,426	638	25%
Pumping Assets (number)	2877	606	24%
Utilities (number)	4512	964	38%
Consumer Assets (number)	1018	419	16%
Gardens & Designed Landscapes (m2)	16,750,150	57	2%
Area of Properties in Care (m2)	198,381	12	0.5%
Area of Battlefields (m2)	4,242,641	7	0.27%
Area of scheduled monuments (m2)	2,809,299	278	11%
Special protection area (SPA) (m2)	54,202,139	311	12%
Special area of conservation (SAC) (m2)	45,143,144	304	12%
National nature reserve (m2)	6,575,095	12	0.5%
Sites of special scientific interest (SSSI) (m2)	104,420,073	537	21%

4.3 Coastal erosion, sea level rise (SLR) and increased flood risk

4.3.1 Erosion

Increased flooding will occur where erosion removes protective features such as coastal dunes, low lying hinterland or undermines existing coastal defences.

Dynamic Coast, identify 3 specific zones at the coast, the first the **Eroded Area (EA)** is land that is projected to be lost by 2050, taking any assets within the location with it. The second is the area of **Erosion Influence (EI)** the immediate 10m inland from the area that will be eroded, making it the next most vulnerable location to increased erosion and flood risk by 2050. The third and final is the **Erosion Vicinity (EV)** which is the 50m landward from the edge of the inland boundary of the area of erosion influence, see Figure 5: Coastal Erosion Zones below:

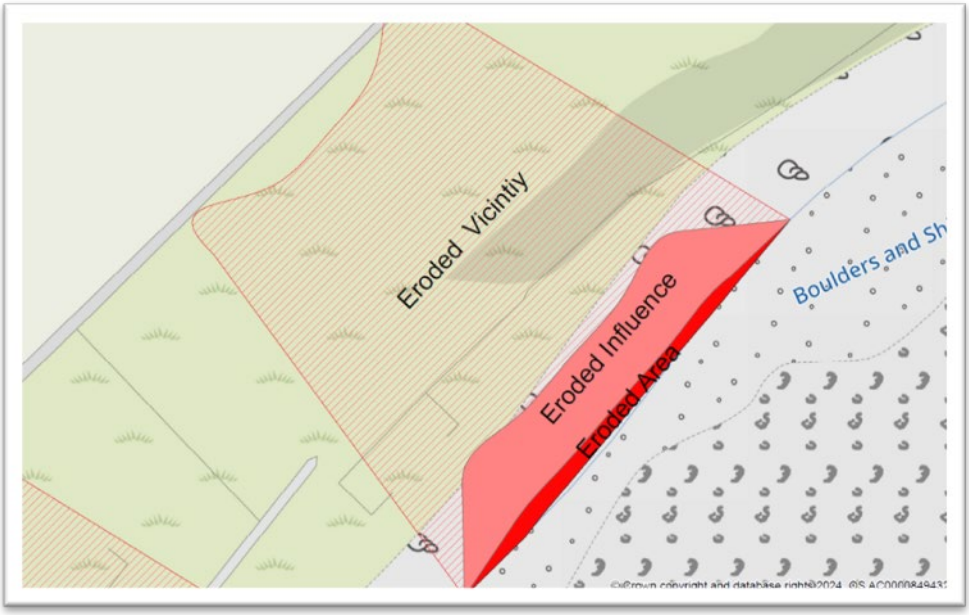

Figure 5: Coastal Erosion Zones

Uncertainty surrounding each of the erosion zones increases as you move landward, with greater confidence in the accuracy of data around the Eroded Area and Eroded Influence zones as well as the timelines of impact, but as you move landward into the Eroded Vicinity the confidence in the data reduces.

4.3.2 Mean Sea level rise, increased flood risk and tidal change

The largest influence leading to sea level rising is thermal expansion as oceans absorb the additional heat trapped by greenhouse gases. Further factors contributing to sea level rise include, loss of ice sheets/glaciers, and less precipitation being locked into snowpacks during the colder months. Current climate change predictions for Scotland show that sea level is expected to rise between 0.30 – 1.16m (high emissions

scenario) by 2100[25]. Some examples of predictions for the Highland Council area are included in Table 3: Predicted Sea Level Rise by 2100, these were taken from Dynamic Coast interactive webmap (which are sourced from the UKCP18 data[26]).

Table 3: Predicted Sea Level Rise by 2100

Sea Level Rise RCP8.5 (95% high) 2100	
Location	Future Sea Level (m)
East Coast	
Nairn	0.92
Golspie	0.95
North Coast	
Thurso	1.0
Cape Wrath	1.02
West Coast	
Kinlochbervie	1.0
Fort William	0.92
Isle of Skye	0.94 – 1.00

As SLR continues to rise, coastal erosion is likely to become more prevalent. As recent storms within the Highland Council area have shown, this may result in loss of protective features such as dunes or artificial defences. This risk is likely to be further exacerbated by increased storminess and more frequent surges resulting in increasing risk to our coastal communities and assets. These are the principal factors underlying the Committee on Climate Changes assessment that coastal flooding and storm impacts are some of Scotland's most severe climate risks.

Tides will also be impacted by SLR, storminess and surge, especially during the spring tides, these higher tides which occur twice in the lunar month, are likely to affect flood risk within coastal communities. The tidal reach may also be impacted by climate change, SLR, surge and storminess, resulting in tidal influence extending further inland, within estuaries and rivers.

4.4 Methodology for reviewing segment numbers

The following methodology was used to help identify those segments with assets at greatest risk and where erosion, increased flood risk and climate change are likely to have significant impact on coastal communities by 2050. This enables The Highland Council to prioritise those locations and focus on developing Local Coastal Change

[25] Coastal Change Adaptation Plan Guidance (dynamiccoast.com)
[26] HES vs LES dashboard

Adaptation Plans (LCCAP) to help communities adapt and become more resilient long-term.

4.4.1 Data review

With 2557 coastal segments to consider a number of data review stages were undertaken to enable those locations at highest risk by 2050 to be identified.

Stage 1

Dynamic Coast compiled coastal change data alongside assets information from SEPA's National Flood Risk Assessment. These were added and erosion impacts were assessed as part of the National Coastal Erosion Risk Assessment[27]. These are listed below, to help prioritise the highest risk locations only those assets considered to have a significant impact on local communities were used, these are highlighted in bold:

- **Residential property (RP)**
- **Non-residential property (N-RP)**
- Garden & Designate Landscapes (GDL)
- Properties in Care (PIC)
- Battlefields (BTLFD)
- Scheduled monuments (ShdMn)
- Special protection area (SPA)
- Nature conservation marine protection area (NCMPA)
- Special area of conservation (SAC)
- National nature reserve (NNR)
- Site of special scientific interest (SSSI)
- **Roads**
- **Rail**
- Runways
- Scottish water assets (various)
- Consumer assets (COMSER)
- Utilities (Util)
- Golf
- Greenspace (including golf courses)

Although, it is recognised that all assets are important the decision to focus specifically on property, road and railway was considered appropriate as these would have the most significant impact on a coastal community, as well as the wider Highland area should they be eroded or be at increased risk from flooding.

[27] Technical Annex Work Stream 2RA https://www.dynamiccoast.com/reports

However, stakeholders with specific interests that are not in the bold list above are welcome to review the base dataset, to identify locations at risk in respect of their assets, allowing them to investigate any adaptations they deem appropriate.

Stage 2

To ensure the impact of climate change would be fully assessed, data from both Dynamic Coast and SEPA was used to consider both erosion and flood impacts. Using the information provided on erosion influence and medium flood risk, 617 segments were identified as having assets at risk from erosion, flood risk or both by 2050, see Figure 6: (617) Segments assets at risk all sources:

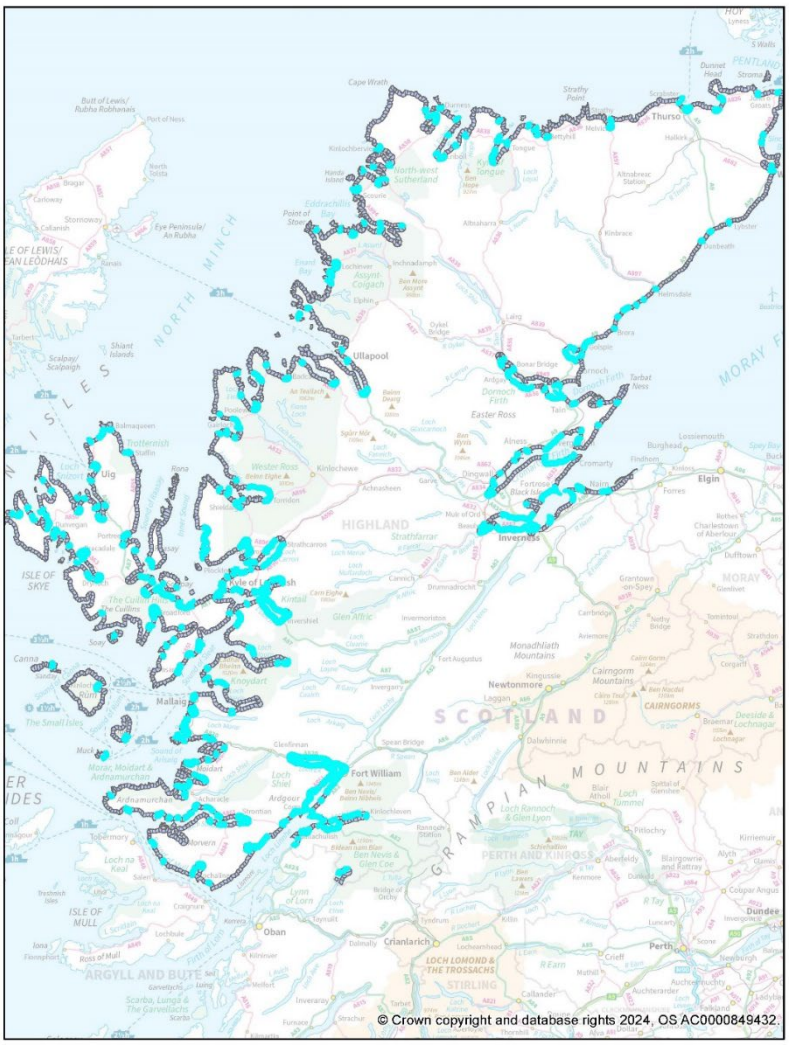

Figure 6: (617) Segments assets at risk all source

To establish the imminent erosion risk to the asset by 2050, Dynamic coast provided 3 classifications these are as follows:

- Erosion area: defined as area with a high probability of being eroded by 2050
- Eroded influence: 10m landward of the eroded area by 2050
- Eroded vicinity: 50m landward of the eroded influence by 2050

For prioritisation purposes, only property, road and rail assets within the eroded area (EA) or eroded influence (EI)by 2050, were included. It was considered that too much uncertainty around the data in eroded vicinity (EV), made it less reliable. This resulted in 192 coastal segments being identified as having assets within them at high probability of being eroded or at increased erosion risk by 2050, see Figure 7: (192) Segments with assets at erosion risk:

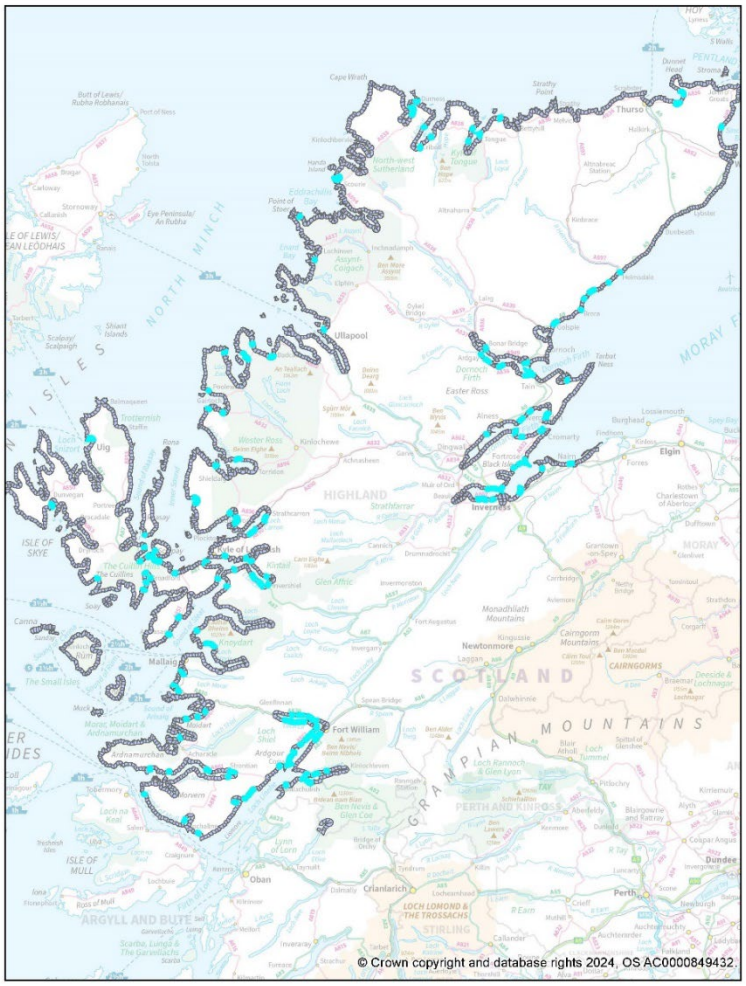

Figure 7: (192) Segments with assets at erosion risk

Dynamic Coast acknowledges that there is uncertainty surrounding the erosion risk, as storm impacts are linked to future weather events – which are inherently uncertain, and linked with this Scotland currently lacks a funded coastal monitoring programme. In some areas recent data is available and updates have been made to shoreline mapping, however in other areas change and risk assessments are based on old data. As Local Authorities develop Regional and Local CCAP it is hoped that data gaps can be addressed (centrally or by councils), and this will help reduce remaining uncertainty.

Coastal flood information from SEPA was also included within the Dynamic Coast project, providing 3 classifications as follows:

- High (H) occurs most frequently – (each year this area has a 10% chance of flooding).
- Medium (M) occur less frequently – (Each year this area has a 0.5% chance of flooding).
- Medium CC (MCC) occur with less frequency - (By the 2080s, each year this area may have a 0.5% chance of flooding).

For the purposes of the RCCAP it was considered that only the High and Medium flood risk would be considered, as these provided an adequate view of flooding issues and replicated the similar decision undertaken for erosion. This resulted in 568 segments being identified with assets at risk of flooding or increased flood risk by 2050, see Figure 8: (568) Segments with assets at flood risk.

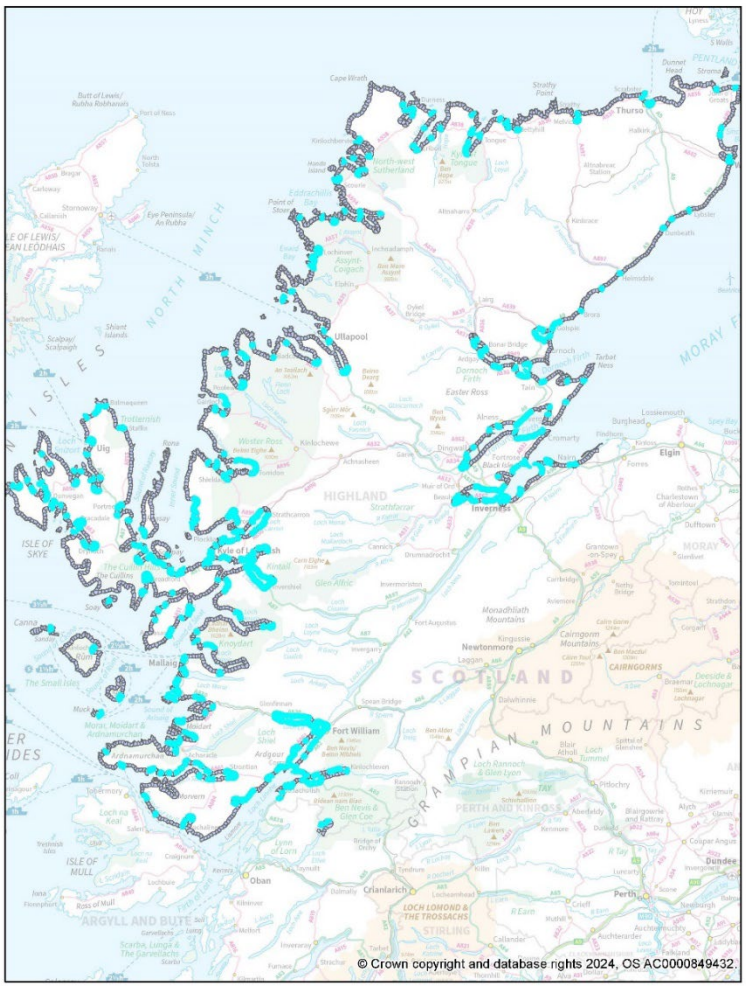

Figure 8: (568) Segments with assets at flood risk

<u>Stage 3</u>

A rationalisation of the 617 segments was undertaken. Where cells were adjacent to each other and appropriate to do so, these were amalgamated leaving 315 locations around the coastline to be considered - see Appendix 1: Summarised numbers and score.

Prioritisation of these 315 locations was undertaken using the scoring system in Table 4 Scoring Matrix below:

Table 4: Scoring Matrix

Asset Type	Erosion Area (EA)	Erosion Influence (EI)	Flood Risk (H)	Flood Risk (M)
Scoring	**5**	**3**	**5**	**3**
Non-Res Property (NRP)	If any present score **5**	If any present score **3**	If any present score **5**	If any present score **3**
Residential Property (RP)	If any present score **5**	If any present score **3**	If any present score **5**	If any present score **3**
Road	If any present score **5**	If any present score **3**	If any present score **5**	If any present score **3**
Rail	If any present score **5**	If any present score **3**	If any present score **5**	If any present score **3**
Risk Scores	Erosion Risk = sum of above		Flood Risk = sum of above	
Total Risk Score	equates to Erosion Score + Flood Risk Score			

This scoring system identified whether the segment contained an asset, regardless of the number or length of any particular asset. It was considered an appropriate high-level approach for the RCCAP, with more detail on numbers and lengths of assets considered further within the local coastal adaptation plans.

The scoring system was based on risk, those locations that had assets either within the EA or FR (H) were allocated a score of 5, as these are the highest risk areas, with high confidence that the impacts will happen by 2050, if not sooner. The score of 3 was allocated for those locations with assets within EI or FR(M), although confidence in the data remains high, there is more uncertainty surrounding the likelihood and frequency of impacts.

For the Regional plan it was considered appropriate to identify those segments which contained an asset of some type, a simple in or out methodology was applied. Whilst, this did not take account of the number of residential or non-residential properties, length of road or rail, it did provide a good indication of those segments that had more than one type of asset at risk from erosion, flooding or both, as shown in Table 4: Scoring Matrix. It is recognised that the number and length of any asset may have a bearing on the order LCCAPs to be taken forward, but at this stage it was sufficient to identify if assets were or were not within a segment.

After all cells were ranked, only those scoring 30 and above were considered to be taken forward for development of more detailed LCCAP. The full table of rankings can be found in Appendix 1: Summarised numbers and score.

4.4 Summarise methodology for final results

By using the 3-stage process described above, it enabled identification of those coastal communities and assets that would be at significant risk by 2050. By amalgamating adjacent segments, it identified several locations where larger areas of the coastline were impacted, with multiple assets or property at risk.

4.5 Most at-risk locations

The following table includes the locations which scored 30 or more and are considered to be the most at risk by 2050. These locations will be considered in more detail through LCCAP, which will be undertaken as and when resources allow. They are listed in order of total score, Table 5: High Risk Locations Total Score.

However, listed at the bottom of table are 5 locations that did not score 30, but due to uncertainty and data, coupled with local concerns, there is justification to take them forward to LCCAPs level. It is suggested that some preliminary work is undertaken around data gathering and monitoring, before including in the full LCCAP process.

Table 5: High Risk Locations Total Score

Sub-cell	Segment ID	Location	Erosion Score	Flood Score	Total Score
3c	847/848/849	Nairn	19	27	**46**
3e	1014/1015/ 1016/1017	Invergordon/Alltan an t-Salainn/Saltburn	19	24	**43**
5e	3179/3180/3181/ 3182	An Aird Dhrocha/Ard Dorch/An Dunan/Dunan/Strolamas/ Strollamus	19	24	**43**
3d	938/939/940	Fortrose	14	24	**38**
5d	2169/2170/2171/2172/ 2173/ 2174 /2175/ 2176/2177	Ratagan/Saraig/Leachachan/ Letterfearn/ Totaig/ Glenshiel	14	24	**38**
5d	2258/2259/2260	Scottas/Aultvoulin/Inverie	14	24	**38**
5d	2310/2311/2312/ 2313/2314/2315	Bun na Caim/Bunacaimb /Portnaluchaig/Cul na Ceapaich/ Back of Keppoch/ Arisaig	14	24	**38**
3d	873/874	Brecknish	21	14	**35**
3e	941	Rosemarkie	24	11	**35**
3f	1175/1176/1177/ 1178	Drummuie/Golspie	11	24	**35**
5d	2153/2154	Dundalloch/Dornie	11	24	**35**
3f	2075/2076/2077/ 2078	Kishorn/Ardarroch/Achantraid/ Achintraid	14	19	**33**
5d	1992/1993	Inveralligin/Rechullin/Alligin	3	29	**32**
5f	2624/2625/2626/2627/ 2628/2629/ 2630	Corribeg/Fassfern/Achdelieu/ Loch Eil	16	16	**32**

5e	3241/3242/3243	Ostaig Beag/Armadale/Ardvasar/ Aird a' Bhasair (Isle of Skye)	8	24	**32**
3d	883/884/885	South Kessock	0	32	**32**
3d	920/921	Croft Downie/Kilmuir	8	24	**32**
4	1500	Portnancon (Loch Eriboll)	8	24	**32**
4	1521/1522/1523/1524	Keoldale/Durness (Kyle of Durness)	16	16	**32**
5c	1892/1893/1894/ 1895/1896	Bualnaluib/Tighnafiline/ Drumchork/Ormiscaig/Aultbea	8	24	**32**
5d	2114/2115/ 2116	Craig/Plockton	0	32	**32**
5f	2637/2638	Claggan/Inverlochy	0	32	**32**
5f	2567/2568/2569/ 2570/2571/2572	Kilmalie/Glengalmadale/Camasnacroise/ Kingairloch	8	24	**32**
5e	3615/3616/3617/ 3618	Churchton Bay/Suisnish Point/Inverarish/Clachan/Kyle (Isle of Raasay)	8	24	**32**
5e	3559/3560/3561	South Cuil/North Cuil/Idrigill (Isle of Skye)	8	24	**32**
5e	3141	West of Peinmore	0	32	**32**
3d	861/862/863/864	Ardersier	6	24	**30**
3d	935/936	The Dock (Avoch)	6	24	**30**
3d	890/891/892/893	Lentran/Inchmore	3	27	**30**
Additional Locations – see justification below table (*)					
5e	3202	Caol Acain/Kyleakin*	3	24	27
3f	1069	Inver**	11	14	25
5d	2044/2045/2046/ 2047/2048	Cruary/Applecross/Milltown***	8	16	24
3c	856/857	Ardesier/Carse of Ardesrsier****	0	24	24
3e	992/993	Dingwall*****	0	22	22

* Caol Acain/Kyleakin: Data gaps and uncertainty around erosion data, flood risk shown high
** Inver: Limited data on defence construction, stability and erosion. Issues with SEPA flood data
*** Cruary/Applecross/Milltown: Loss of road severe impact on community – more data & monitoring
**** Ardersier/Carse of Ardersier: Limited data on defence construction
***** Dingwall: No data available on erosion – monitoring existing flood defences shows erosion

Those locations within table 5 are represented visually in Figure 9: Segments/Locations scoring 30 or more, providing an overview of those locations around the Highland Council coastline, likely to be most impacted by Climate change coastal erosion, SLR and increased flood risk by 2050.

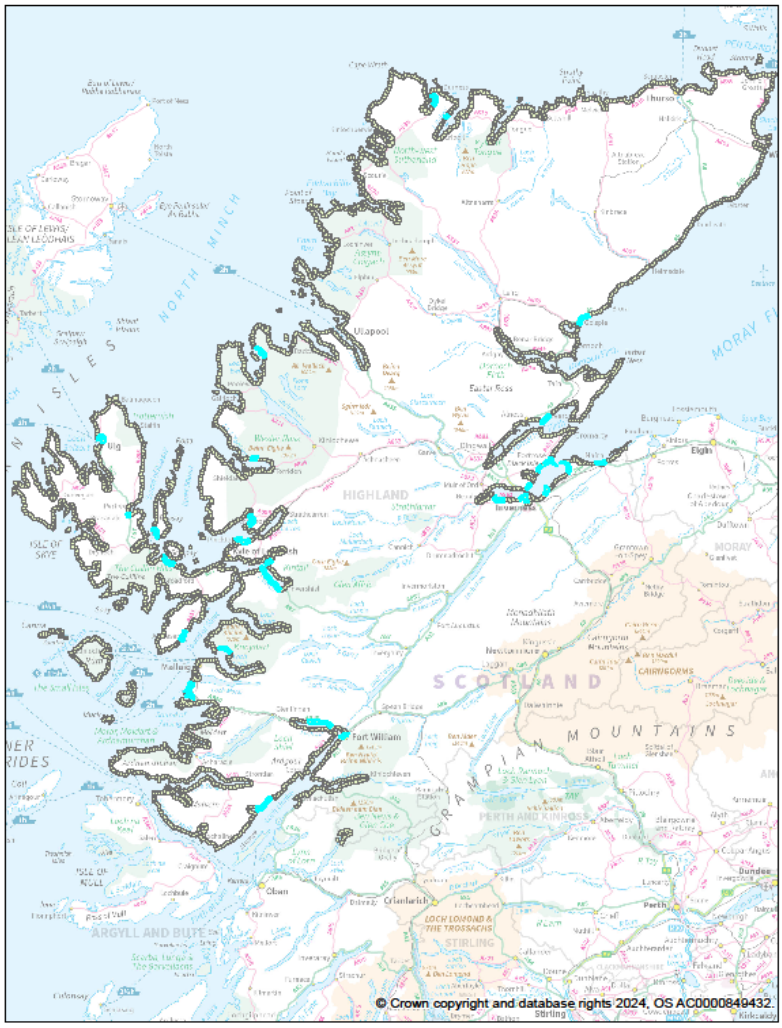

Figure 9: Segments/Locations scoring 30 or more

4.6 Uncertainty

Uncertainties are things that are not known, or are in a state of doubt, or are things whose effect is difficult to know[28]. They have the potential to have major consequences for decision makers and future planning such as creating climate change adaptive and resilient communities.

Uncertainty occurs when insufficient data, monitoring or age of data results in lower confidence levels such as:

- Lack of information on condition and location of coastal protection features both natural, such as Dunes or salt marshes etc. and engineered coastal defence structures.
- Data is old and may no longer represent the existing shoreline condition

[28] Managing uncertainty: Questions for decision-makers to ask in an uncertain environment - NAO insight

- Monitoring is rarely undertaken and therefore details on coastal erosion, storm impacts is not available
- Future scenarios of climate change

Whilst undertaking the data review, it was noted that some locations received a zero score for erosion, but still achieved 30 or more overall, these can be seen in table 5. This raised concern that erosion may be underrepresented in other locations and a further review was undertaken, this identified uncertainty over the quality of data or a lack of information, especially relating to erosion.

Some of the factors causing uncertainty that have been discussed above can be reduced over time with good monitoring, data gathering and improved science etc. This will result in an improved understanding of the climate change impacts on the Highland Council coastline and coastal communities. It will enable a clearer pathway to be identified and ensure the Highland Council and its coastal communities are well-placed to respond to the impacts of Climate Change, providing an opportunity for adaptation and resilience to be developed over time.

Chapter 5 Next Steps

5.1 Local coastal change adaptation plans (LCCAPs)

The local plans will provide a mechanism to look at the highest risk areas in more detail, providing more information and updated information (where possible) on the type of risk, as well as assets at risk, possible short-term mitigation measures together with a plan for the longer-term adaptation and resilience of the coastal community.

At the LCCAP level a more detailed approach will be required to establish the number, area and length of assets at risk in a particular location. It should include a review of all assets identified within stage 1 of RCCAP data review.

It will also be important to establish whether the available data provided for RCCAP is relevant and appropriate for each location identified for LCCAP. This may include, but not be limited to, undertaking ground truthing to establish the validity of the data, survey work such as threshold levels, topography, vegetation, artificial defences and/or establishing a data collection and monitoring programme.

Within the LCCAPs, pathways will be explored, identifying actions that could be implemented to reduce risk. These actions will not necessarily be required immediately. Trigger points will be recommended at which stage the implementation of particular actions within the pathway should be considered in greater detail. This will allow an adaptive response to issues relating to coastal erosion and flood risk, where some actions may not be required for some time into the future, or where interventions are required sooner than anticipated due to accelerated erosion or increased climate change impacts.

The RCCAP has identified the coastal communities at high risk, which will allow the Highland Council to communicate the risk and involve the community in the development of the LCCAP. By working with the communities, it will help them become more adaptive and resilient to the increasing risk from climate change, increasing sea level rise, coastal erosion and flooding.

5.2 Required resources

Development of the Local Coastal Change Adaptations Plans, including the number of plans taken forward, will be dependent on the availability of resources.

Appendix 1 – Summarised numbers and score

Sub_Cell	SegmentID	HTMLNAME	Total Erosion Score	Total Flood Score	Total Score
3c	847/848/849	Nairn	19	27	**46**
3e	1014/1015/ 1016/1017	Invergordon/Alltan an t-Salainn/Saltburn	19	24	**43**
5e	3179/3180/3181/ 3182	An Aird Dhrocha/Ard Dorch/An Dunan/Dunan/Strolamas/Strollamus	19	24	**43**
3d	938/939/940	Fortrose	14	24	**38**
5d	2169/2170/2171/2172/2173/ 2174/2175/ 2176/2177	Ratagan/Saraig/Leachachan/Letterfearn/Totaig/ Glenshiel	14	24	**38**
5d	2258/2259/2260	Scottas/Aultvoulin/Inverie	14	24	**38**
5d	2310/2311/2312/ 2313/2314/2315	Bun na Caim/Bunacaimb/Portnaluchaig/Cul na Ceapaich/ Back of Keppoch/ Arisaig	14	24	**38**
3d	873/874	Brecknish	21	14	**35**
3e	941	Rosemarkie	24	11	**35**
3f	1175/1176/1177/1178	Drummuie/Golspie	11	24	**35**
5d	2153/2154	Dundalloch/Dornie	11	24	**35**
5d	2075/2076/2077/2078	Kishorn/Ardarroch/Achantraid/Achintraid	14	19	**33**
5d	1992/1993	Inveralligin/Rechullin/Alligin	3	29	**32**
5f	2624/2625/2626/2627/2628/2629/2630	Corribeg/Fassfer/Achdelieu/Loch Eil	16	16	**32**
5e	3241/3242/3243	Ostaig Beag/Armadale/Ardvasar/Aird a' Bhasair (Isle of Skye)	8	24	**32**
3d	883/884/885	South Kessock	0	32	**32**
3d	920/921	Croft Downie/Kilmuir	8	24	**32**
4	1500	Portnancon (Loch Eriboll)	8	24	**32**
4	1521/1522/1523/1524	Keoldale/Durness (Kyle of Durness)	16	16	**32**
5c	1892/1893/1894/ 1895/1896	Bualnaluib/Tighnafiline/ Drumchork/Ormiscaig/Aultbea	8	24	**32**
5d	2114/2115/ 2116	Craig/Plockton	0	32	**32**
5f	2637/2638	Claggan/Inverlochy	0	32	**32**
5f	2567/2568/2569/2570/2571/2572	Kilmalie/Glengalmadale/Camasnacroise/ Kigairloch	8	24	**32**
5e	3615/3616/3617/3618	Churchton Bay/Suisnish Point/Inverarish/Clachan/Kyle (Isle of Raasay)	8	24	**32**
5e	3559/3560/3561	South Cuil/North Cuil/Idrigill (Isle of Skye)	8	24	**32**
5e	3141	West of Peinmore	0	32	**32**
3d	861/862/863/864	Ardersier	6	24	**30**
3d	935/936	The Dock (Avoch)	6	24	**30**
3d	890/891/892/893	Lentran/Inchmore	3	27	**30**
5d	2106/2107/ 2108	Imair/Arnarff/Cnocan Donn (Loch Carron)	13	16	**29**
5f	2690/2691/2692	Kentallen	5	24	**29**
3f	1090/1091/1092/1093	Tarlogie/Ardjachie/Meikle Ferry South	16	11	**27**
5f	2587/2588/2589/2590/2591	Clo Mhuillin / Clovullin/Corran/Ardgour	8	19	**27**
3d	886/887/888/889	Bunchrew	11	16	**27**
5f	2632/2633/2634	A'Chorpaich/Corpach/Banbhaidh/Banavie	3	24	**27**
3d	915/916	Craigrory/Balgunloune	3	24	**27**
3d	917/918/919	North Kessock	3	24	**27**
3e	955	Newton of Cromarty	3	24	**27**
5c	1791	Ardmair	3	24	**27**
5d	2017/2018	Ardheslaig, Shieldaig	3	24	**27**
5d	2139/2140/ 2141	Ardelve/Camas-Longart	3	24	**27**
5d	2159/2160/2161/2162	Inverinate	3	24	**27**
5d	2188/2189/2190/ 2191	Glader/Galtair/Coulindoune/Eilanreach/Glenelg	3	24	**27**
5f	2639/2640	Upper Auchintore/An Gearsdan/Fort William	3	24	**27**
5f	2686	South Ballachulish	3	24	**27**
5e	3173/3174	Area West Aricharnach/Luib	3	24	**27**
5e	3188/3189/3190/3191/3192/3193	Corry/An t-Aht Leathann/Broadford/ A'Phairce Dubh/Blackpark/Harrapul/Harrapool/Achadh a' Chuirn/Waterloo	3	24	**27**
5e	3202	Caol Acain / Kyleakin	3	24	**27**
5f	2466/2467/2468/ 2469/2470/2471	Strontian/Ardgour	8	19	**27**
3d	899/900	Ferrybrae/Lovat Br/Dunballoch/Cruivend/Groam (Beauly)	0	27	**27**

Sub_Cell	SegmentID	HTMLNAME	Total Erosion Score	Total Flood Score	Total Score
5f	2615/2616/2617/2618/2619/2620/2621/2622	Garvan/Drumfern/Drumsallie/Kinlocheil	8	19	**27**
5f	2683/2684	West Laroch	8	19	**27**
5e	3215	Kylerhea/Caol Reatha (Breakish)	3	24	**27**
5f	2635/2636	Caol/Taobh Lochaidh/Lochyside	0	27	**27**
5f	2598/2599/2600/2601/2602/2603/2604	Conaglen/Gorsten/Treslaig/Camusnagaul/Camus nan Gaul	11	14	**25**
3f	1069	Inver	11	14	**25**
5d	2044/2045/ 2046/2047/2048	Cruary/Applecross/Milltown/Applecross	8	16	**24**
5d	2167/2168	Invershiel/Shiel Bridge	8	16	**24**
3d	878/879/880	Glebe/Crown	0	24	**24**
3g	1270	Wick	0	24	**24**
3g	1284	Bridge of Wester/Birkel Hills (Sinclair's Bay)	0	24	**24**
4	1349/1350/ 1351	Thurso	0	24	**24**
5c	1696	Culkein/Drumbeg	0	24	**24**
5d	1950/1951/1952/1953	Strat/Auchtercairn/An Ard/Charlestown	0	24	**24**
5d	1960/1961	Badachro	0	24	**24**
5d	2091/2092/2093/2094/2095	Lochcarron/Kirkton/Kildonan (Strathcarron)	0	24	**24**
5d	2125/2126/ 2127	Erbusaig/Badicaul/Caol Loch Ailsse/Kyle of Locahalsh	0	24	**24**
5d	2205/2206/2207	Arnisdale/Corran	0	24	**24**
5f	2452/2453	An Sailean / Salen (Acharacle)	0	24	**24**
5f	2535/2536	Loch Alainn/Lochaline/Ardtornish	0	24	**24**
5f	2679/2680	Glencoe	0	24	**24**
5e	3134/3135	Budhmor/Port Righ/Portree	0	24	**24**
5e	3231/3232/3233	Duisdeil Beag/Duisdalebeg/Camus Croise/Camascross (Isle of Skye)	0	24	**24**
5e	3269	An t-Ord / Ord (Teangue) Isle of Skye	0	24	**24**
5e	3375/3376	Cartbostbeg/Carbost (Isle of Skye)	0	24	**24**
5e	3472/3473/3474	Kilmuir/Kinlochfollart/Dun Bheagan/Dunvegan (Isle of Skye)	0	24	**24**
5e	3302/3303	Ringill/Kirikibost/Cnoac Taibhse/Kilmarie (Strathaird Isle of Skye)	8	16	**24**
3c	856/857	Ardersier/Carse of Ardersier	0	24	**24**
5c	1728/1729/ 1730	Baddidaroch/Inver/Lochinver	0	24	**24**
5f	2592/2593/2594/2595/2596	Aryhoulan, Ardgour/Inbhir Scadail/Inverscaddle Bay/Conaglen (Ardgour)	8	16	**24**
5c	1796	Ullapool	0	24	**24**
5f	2445	Lag Ath / Laga	11	11	**22**
5d	2248	Airor (Inverie)	14	8	**22**
5d	2130/2131/ 2132	Balmacara/Reraig	3	19	**22**
5e	3177/3178	Luib	6	16	**22**
3e	992/993	Dingwall	0	22	**22**
5f	2460	Ceol na mara, Strontian	8	11	**19**
4	1437/1438	Tongue hostel/Mains/Tongue	11	8	**19**
5d	1995/1996/ 1997/ 1998/ 1999/2000	Torridon/Annat	0	19	**19**
5f	2605/2606/2607/2608/2609/2610/2611/2612/2613/2614	Achaphubuil/Blaich/Blaich West/Duisky (Loch Eil)	8	11	**19**
3f	1186	Brora	3	16	**19**
5d	2100/2101/2102/2103/2104	Cam-Allt/Camalt/Attadale (Strathcarron)	3	16	**19**
3f	1112/1113	Ardgay/South Bonar Bridge	3	16	**19**
3d	911	Redcastle/Milton	0	19	**19**
3e	1028	Carse of Bayfield/Lower Bayfield (nr Ankerville)	0	19	**19**
5b	1628/1629/1630	Scouriemore/Scourie Bay/Scourie	11	8	**19**
5d	2145/2146/ 2147/2148	Allt-Nan-Sugh/Lochlonghead/Nonach/Killilan (Dornie)	0	19	**19**
5f	2681/2682	Ballachulish/East Laroch	0	19	**19**
5d	2376/2377/2378	Dorlin Rd, Moidart/Cruach nam Meann/Shielfoot/ Archarchle	11	8	**19**
5f	2516/2517	Na Druimeanan/Drimnin/Bun a' Mhuilinn/Bunavullin	3	16	**19**
5d	2137	Nostie	0	19	**19**
5d	2382	Aird Tobha / Ardtoe	0	19	**19**
5d	2306/2307	Toigal/Morar	3	16	**19**
5d	2086	Ardaneaskan	0	19	**19**
3d	902/903/904	Beauly	0	19	**19**

Sub_Cell	SegmentID	HTMLNAME	Total Erosion Score	Total Flood Score	Total Score
4	1335/1336	Dunnet	18	0	**18**
4	1428	Clashbuie/Tubeg/Skerray Bay	8	8	**16**
5d	1957	Lecknasaide/Camassie Wood/Shieldaig	8	8	**16**
5d	2067	Russel (Applecross)	8	8	**16**
5d	2349	Alisary (Lochailort)	8	8	**16**
5e	3295	NE of Arinacraig, Strathaird, Broadford (Isle of Skye)	8	8	**16**
5e	3236/3237	Teangue/Sasaig/Saasaig (Isle of Skye)	8	8	**16**
5e	3411/3412	Heribost/Roag, Dunvegan (Isle of Skye)	8	8	**16**
5e	3555	Cuidrach, Earlish Portree (Isle of Skye)	0	16	**16**
3e	964/965	Kirkton/Balblair	8	8	**16**
3e	987/988	W Conon Br to Maryburgh	0	16	**16**
3f	1085/1086	Plaids/Tain	0	16	**16**
3g	1205	Helmsdale	8	8	**16**
3g	1226	Dunbeath	0	16	**16**
4	1418/1419	Bettyhill/Invernaver	0	16	**16**
5a	1583	Loch Clash Pier/Kinlochbervie	0	16	**16**
5b	1620	Fanagmore, Scourie	0	16	**16**
5b	1637	Ardmore, Rhiconich, Lairg	0	16	**16**
5c	1653	Kylestrome	0	16	**16**
5c	1807/1808/ 1809	Balblair/Clachan/Loch Broom, Garve	0	16	**16**
5c	1847/1848	Dundonell	0	16	**16**
5d	2009	Sildeag / Shieldaig	0	16	**16**
5d	2049	Camusterrach	0	16	**16**
5d	2051	Ard-dhubh	0	16	**16**
5d	2084	Stromemore	0	16	**16**
5d	2118	Plockton	0	16	**16**
5d	2299/2300	East Bay/Mallaig/Malaig	0	16	**16**
5d	2317	Morroch Point/Arasaig/Arisaig	0	16	**16**
5d	2333	Glenmamie (Lochailort)	0	16	**16**
5d	2356/2357/2358/ 2359	Forsay/Glenuig Estate/Glenuig	8	8	**16**
5f	2428/2429	Kilchoan	0	16	**16**
5f	2648	Corrychurrachan, Fort William	0	16	**16**
5c	3081/3082	Achiltbuie	0	16	**16**
5e	3162	Sconser	0	16	**16**
5e	3164/3165	Kinloch Ainort, Sconser	0	16	**16**
5e	3204	South Obbe (Kyleakin)	0	16	**16**
5e	3389/3390/3391/ 3392/3393	Coillore/Totarder/Balgowan/Bracadale (Isle of Skye)	0	16	**16**
5e	3493	Lower/Upper Halistra, Hallin, Dunvegan (Isle of Skye)	0	16	**16**
5e	3546	Ceann Sail Eighre / Kensaleyre (Isle of Skye)	0	16	**16**
5f	2438/2439	Ardslignish/Glenmore (Acharacle)	8	8	**16**
5f	2583/2584/2585	Cuil Moss/Sallachan	8	8	**16**
5e	3297/3298/3299	Arinacraig/Faoilean Strathaird (Isle of Skye)	8	8	**16**
5e	3289	Na Torrin / Torrin	8	8	**16**
5d	2253	Sandaig	0	16	**16**
5e	3539/3540/3541	Skeabost / Sgeitheabost/Glen Bernisdale (Isle of Skye)	0	16	**16**
5a	1581	Kinlochbervie	0	16	**16**
5d	2012/2013	Shieldaig	0	16	**16**
5d	2112	Fernaig/Porthcuhullin /Achmore (Strome Ferry)	0	16	**16**
5e	3692	Kinloch, Isle of Rum	0	16	**16**
5e	3696	Kinloch	0	16	**16**
5d	3737	Port Mor (Isle of Muck)	0	16	**16**
3e	960/961/962	Poyntzfield/Jemimaville	6	9	**15**
4	1354/1355	Scrabster	0	14	**14**
5c	1906/1907/ 1908	Inverewe/Sron Dubh/Poolew	0	14	**14**
4	1491/1492	Souterrain/Creag na Faoilinn (Loch Eriboll)	3	11	**14**
5c	1921	Cove/Poolewe	8	5	**13**
5e	3171	Maol Ban Fish Farm, Sconser	5	8	**13**
3f	1122	Invershin	0	13	**13**
5f	2658	North Ballachulish	3	8	**11**
3f	1104/1105	A836/Dun Alascaig/Coilte Mhor (Easter Fearn, nr Ardgay)	8	3	**11**
4	1486	Kempie/Torr Liath (Loch Eriboll)	8	3	**11**
5c	1876	Achgarve	8	3	**11**

Sub_Cell	SegmentID	HTMLNAME	Total Erosion Score	Total Flood Score	Total Score
4	1451/1452	Achuvoldrach/Talmine/Kyle of Tongue	3	8	**11**
5c	1705	Culkein/Lochinver	3	8	**11**
5f	2562	South Corry, Kingairloch	3	8	**11**
5e	3464/3465	Cealabost / Colbost Dunvegan (Isle of Skye)	0	11	**11**
5f	2654/2655/2656	Onich	0	11	**11**
3e	1031/1032/ 1033	Nigg	8	3	**11**
3f	1173	Littleferry	0	11	**11**
3g	1286	Stain/South Keiss	3	8	**11**
5c	1736	Inbhair Chircaig / Inverkirkaig	3	8	**11**
5d	1985	Diabaig, Torridon	0	11	**11**
5d	2346	Inverailort (Lochailort)	0	11	**11**
5d	2367/2368/2369/ 2370	Kinlochmoidart (Lochailort)	0	11	**11**
5d	2385	Arivegaig, Acharacle	0	11	**11**
3f	1126	Bonar Bridge	3	8	**11**
5f	2533	NE of Ardmor, Lochaline/Morvern	3	8	**11**
5f	2641/2642/2643	Achadh Todhair/Druimarbin/Drimarben	3	8	**11**
5f	2661/2662	Callert/North Ballachulish	3	8	**11**
3f	1168/1169	The Mound, Dornoch/Balbair Wood (A9/A839)	0	11	**11**
4	1507	Durness	0	11	**11**
5b	1613/1614	Laxford/Badnabay	0	11	**11**
3	2380	An Fhadail Dubh / Newton of Ardtoe	0	11	**11**
5f	2671	Kinlochleven	0	11	**11**
5e	3679/3680	A' Chill/Isle of Canna	0	11	**11**
3f	1116/1117	Balinoe/Balnahinsh (nr Ardgay)/Culrain	0	11	**11**
4	1445/1446/1447/1448	Kinloch Cott/Lodge/Tongue (Kyle of Tongue)	3	8	**11**
5c	1868/1869	Little Gruinard/Laide/Achnasheen	3	8	**11**
5c	1767	Achiltibuie	0	11	**11**
3f	1143/1144	Skibo/Loch Evelix/Carnegie Golf Club/Cuthill Links	6	3	**9**
3e	1020	Barbaraville	3	6	**9**
3f	1109/1110	Wester Fearn/Ardchronie (nr Ardgay)	8	0	**8**
4	1339/1340	Thurdistoft/Castletown	8	0	**8**
4	1513	Balnakeil Craft Village	8	0	**8**
5d	2181	Ardintoul	8	0	**8**
3d	937	Newton	0	8	**8**
3e	985	Corntown	0	8	**8**
3e	990	Kildun (nr Maryburgh)	0	8	**8**
3e	996	Lemlair/ Dingwall	0	8	**8**
3e	1005	Alness Ind Est/Alness Bay/ Ardroy Sand	0	8	**8**
3e	1008	Alness Point/Business Park/Teanininch Beach	0	8	**8**
3f	1094/1095	Cambuscurre Wood/Redburn (nr Edderton)	0	8	**8**
3f	1098	Ardmore	0	8	**8**
3f	1162/1163/ 1164/1165/ 1166	Skelbo/Camusavie/Cambusmore	0	8	**8**
3g	1237	Swineyhill/Cairnroich/Lybster	0	8	**8**
3g	1262/1263	Wick Hill of Man/Distillery/South Pier/Hospital/Bignold Park (A99/A822)	0	8	**8**
4	1304	Jonh o' Groats	0	8	**8**
4	1310	Gills Canisbay	0	8	**8**
4	1381/1382/ 1383	Bighouse/ Forsinard/Melvich	0	8	**8**
4	1423	Crossburn/Borgie/Skerray (Torrisdale Bay)	0	8	**8**
4	1425	Achtoty/Torrisdale	0	8	**8**
5a	1589	Rhichonich (Lairg)	0	8	**8**
5b	1609	Laxford Br/Laxford	0	8	**8**
5c	1660	Glendhu Bothy, Kylestrome	0	8	**8**
5c	1690/1691	Drumbeg, Lairg	0	8	**8**
5c	1734	Inverkirkaig/Lochinver	0	8	**8**
5c	1738/1739	Inverkirkaig/Polly More, Lochinver	0	8	**8**
5c	1859	Badluachrach/Badluarach	0	8	**8**
5c	1914	Brae	0	8	**8**
5d	2053/2054	Collieghillie/Toscaig/Applecross	0	8	**8**
5d	2061	Drochaid Mhor nr Tornapress	0	8	**8**
5d	2071	Kishorn Port/Corrie Mhor Russel (Applecross)	0	8	**8**
5d	2073	Tornapress (Kishorn)	0	8	**8**
5d	2143	Conchra (Dornie)	0	8	**8**
5d	2156/2157/ 2158	Carr Brae/Dornie	0	8	**8**

Sub_Cell	SegmentID	HTMLNAME	Total Erosion Score	Total Flood Score	Total Score
5d	2164/2165/ 2166	Inverinate/Morvich/Carn-gorm/Allt a' Chruinn/Glenshiel	0	8	8
5d	2219/2220	Kiloch Hourn/Invergarry	0	8	8
5d	2222	Skiary, Kinlochhourn	0	8	8
5d	2285	An Tairbeart / Tarbet	0	8	8
5d	2319/2320/2321	West of Millburn/Arasaig/Arisaig	0	8	8
5d	2331	Beasdale/Arasaig/Arisaig	0	8	8
5f	2442	Ardnamurchan, Glenborrdale	0	8	8
5f	2448	Camus Inas	0	8	8
5f	2450	Camastorsa/Torr Molach (Loch Sunart)	0	8	8
5f	2456/2457/2458	Resipole/Ledaig/Strontian (Acharacle)	0	8	8
5f	2476/2477	Meall a Chuilinn/Creag Dubh/Laudale Jetty, Ardgour	0	8	8
5f	2523	Killundine/Drimnin	0	8	8
5f	2539	Achranich	0	8	8
5f	2645	Heron Bay	0	8	8
5f	2698	Keil/Duror	0	8	8
5e	3097	Kilmaluag	0	8	8
5e	3106/3107	Steinnseall / Stenscholl/An Garadh Fada/Garafad/Staffin	0	8	8
5e	3145	Camas Tianabhaig / Camustianavaig	0	8	8
5e	3169	SW Rainbows End, Sconser	0	8	8
5e	3184	West Strath Bruial Ground Broadford	0	8	8
5e	3262	Tarskavaig/Achnacloich (Isle of Skye)	0	8	8
5e	3266	Tokavaig, Teangue (Isle of Skye)	0	8	8
5e	3282	Heaste/Heasta, Broadford (Isle of Skye)	0	8	8
5e	3291	Torrin (Isle of Skye)	0	8	8
5e	3378/3379/3380	Drynoch/Satran/Carbostmore (Carbost, Isle of Skye)	0	8	8
5e	3387	Gesto/Cocaire, Struan (Isle of Skye)	0	8	8
5e	3400	An Gearraidh M?r / Gearymore	0	8	8
5e	3405	Feolaig Ard / Upper Feorlig	0	8	8
5e	3446/3447	Hamaramore/Gleann Dail/Glen Dale (Isle of Skye)	0	8	8
5e	3476	Dunvegan (Isle of Skye)	0	8	8
5e	3478	Suardal, Dunvegan (Isle of Skye)	0	8	8
5e	3489	Stein	0	8	8
5e	3524/3525	Coishletter, Edinbane (Isle of Skye)	0	8	8
5e	3529	Fanks/Creag Nam Fangan, Edinbane (Isle of Skye)	0	8	8
5e	3536	Aird, Bernisdale(Isle of Skye)	0	8	8
5e	3572	Bornersketaig/Borgh na Sgiotaig/Kilmuir (Isle of Skye)	0	8	8
5e	3574/3575/3576	NE Kilmuir Burial Ground/South Duntulm/Duntulm (Isle of Skye)	0	8	8
5e	3641	Scalpay House/Keepers House (Isle of Scalpay)	0	8	8
5e	3662	Soay, Elgol (Isle of Soay)	0	8	8
5d	3734/3735	Na Breachnaich/Poll nam Partan/ Kildonan/Galmisdale (Isle of Eigg)	0	8	8
3d	912/913/914	Corgrain Point/Coulmore/ Coul Point	0	8	8
3d	928	Munlochy Mains/Munlochy Bay	0	8	8
4	1460	Lubinvullin/Achininver/Talmine	0	8	8
5c	1677	Kylesku	0	8	8
5d	2303/2304	Morar	0	8	8
5f	2565	Kingairloch, Ardgour	0	8	8
5d	1945	Big Sand/Gairloch	6	0	6
5e	3461	Totaig, Dunvegan (Isle of Skye)	0	6	6
5d	3740	Port Mhor/Fionn-Aird (Isle of Muck)	0	6	6
5f	2665/2666/2667/2668/2669	Kinlochleven/Sw of Narrach Br/NE of Clachmore/ Kinlochmore Cemetry	3	3	6
5d	2353	Roshven, Glenluig (Lochailort)	5	0	5
5f	2544	Inninmore, Ardtornish	5	0	5
3e	1002	Kiltearn Beach	3	0	3
3f	1190	Clynemilton/Kintradwell	3	0	3
3g	1200	Westgarty / Loth	3	0	3
5d	1964	Port Henderson	3	0	3
5e	3646	Narrows Cott/Corran a' Chinn Uachdaraich (Isle of Scalpay)	3	0	3
3e	957/958/959	Rosefarm/Shoremill	0	3	3
3e	1018/1019	Balintraid	0	3	3

Sub_Cell	SegmentID	HTMLNAME	Total Erosion Score	Total Flood Score	Total Score
3e	1055	Rockfield Braes/Little Tarrel Castle (nr Rockfield)	0	3	3
3f	1107	A836 NW of Easter Fearn (Nr Ardgay)	0	3	3
3f	1193/1194	Kintradwell Links/Lothbeg/Lothbeg Point	3	0	3
4	1479	Hope (Lairg)	0	3	3
4	1535	Keoldale Pier West/Durness	0	3	3
4	1537	Achiemore, Durness	0	3	3
5c	1683	Kerrachar, Kylesku	0	3	3
5c	1732	Badnaban, Lochinver	0	3	3
5d	2122	Portneora/Drumbuie	0	3	3
5d	2415	Portuairk	0	3	3
5f	2480	Invasion Bay, Ardgour	0	3	3
5f	2579/2580	Inversanda (Ardgour)	0	3	3
5f	2652	Inchree/Bunchree	0	3	3
5f	2695	Cuil/Duror (Appin)	0	3	3
5f	2777	SW of Hollybank, Glen Etive	0	3	3
5f	2779	Druimachoish/Lochetive House, Glen Etive	0	3	3
5e	3370	Portnalong, Carbost (Isle of Skye)	0	3	3
5e	3444	Milovaig, Glendale (Isle of Skye)	0	3	3
5e	3519	Greshornish, Edinbane, Portree (Isle of Skye)	0	3	3
5e	3338	Glenbrittle	3	0	3
4	1494	Polla/Upper Roadstead (Loch Eriboll)	0	3	3
3d	897	Wester Lovat, Beauly	0	3	3
3e	1046	Balintore	0	3	3
3g	1197	Loth	0	3	3
3g	1230	Latheronwheel	0	3	3
5d	2021	Kenmore (Loch Torridon)	0	3	3