Welsh Government

Strategic Environmental Assessment

Environmental Report

Flood and Coastal Erosion Risk Management: Development of a National Strategy for Wales

Lower Swansea Vale Flood Risk Management Scheme

Date of issue: **24 June 2019**
Responses by: **16 September 2019**

Non-Technical Summary

What is this document?

This is the non-technical summary of the environmental report that accompanies the consultation on the draft National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales. The consultation period runs from 24 June to 16 September 2019.

The National Strategy for Flood and Coastal Erosion Risk Management in Wales

The National Strategy for FCERM in Wales herein referred to in this environmental report as 'the Strategy' aims to **reduce risk to people, homes and businesses from flooding and coastal erosion through the sustainable management of our environment.**

The Strategy will deliver this aim through working towards five overarching objectives (A-E):

- Improving our understanding and communication of risk
- Preparedness and building resilience
- Prioritising investment to the most at risk communities
- Preventing more people becoming exposed to risk
- Providing an effective and sustained response to events

Strategic Environmental Assessment

A strategic environmental assessment (SEA) has been undertaken to ensure that environmental effects are considered during the development of the Strategy alongside technical, economic and other considerations. This report sets out the findings of the SEA.

The SEA is well aligned with the Sustainable Development (SD) and Sustainable Management of Natural Resource (SMNR) principles and so it is being used to not only assess the environmental effects of the Strategy but is a valuable tool to demonstrate how the Strategy is delivering and promoting:

- SMNR,
- The national priorities of the Natural Resources Policy,
- Section 6 - Biodiversity and ecosystem resilience duty

and in doing so, contribute to the wellbeing objectives and goals.

Scoping was undertaken in Autumn 2018 to focus the assessment on the likely significant effects of the Strategy. This concluded that significant effects on air quality were unlikely and therefore this topic was scoped out. The scoping also considered what elements of the Strategy are likely to lead to significant effects. For example, the promotion of interventions to reduce the risk of flooding could conceivably lead to environmental effects, whereas the mapping and modelling of flood risk could not. This resulted in objectives A, C and D being taken forward for assessment.

During scoping, relevant policies, plans, programmes and legislation were reviewed to determine potential synergies and conflicts with the Strategy. A summary of baseline information relevant to the Strategy was documented and developed to determine key issues and trends. This informed the development of assessment criteria to be applied to those objectives scoped in to the assessment.

Habitats Regulations Assessment

A Habitats Regulations Assessment is being developed iteratively with the Strategy and the SEA and will be published in a separate draft report alongside the draft Strategy. The conclusions of the draft HRA have been considered within the SEA.

Summary of Significant Environmental Effects

The SEA has been undertaken at a high level, appropriate to the national scale of the Strategy. However, the assessment, focusing on each specific Strategy objective, is presented in a manner that can be applied to, and influence, lower level plans, strategies or even project level EIA, to allow Risk Management Authorities to avoid or reduce adverse effects and maximise beneficial effects when delivering under the objectives.

Population & Human Health

The purpose of the Strategy is the management and reduction of flood risk and coastal erosion for communities, businesses and infrastructure across Wales and in so doing, reduce the impacts and consequences and aid rapid recovery. All objectives demonstrated significant beneficial effects on population and health. The promotion of improved prioritisation of flood risk management to the most vulnerable communities is considered to have significant beneficial effects on reducing inequalities and social deprivation within communities at risk. Informed communities that understand and are prepared for flood events and are effectively supported by efficient emergency response, will develop resilience and be better equipped to respond to events, reduce stress and anxiety and improve well-being.

Biodiversity, Flora and Fauna

Objective A, which includes measures to develop a process to challenge SMP2 policies has the potential for significant adverse effects**,** this is linked with the conclusions of the draft HRA. Much of the coastal area of Wales is internationally designated, yet the conflict arises where coastal communities are at risk of flooding and erosion. Whilst this is a significant adverse effect, the justification under Article 6(4) is made and compensatory mechanisms such as the National Habitat Creation Programme (NHCP) are in place.

The Strategy's strengthening and focus on the use of NFM in interventions is beneficial. It actively promotes nature-based solutions in line with the NRP, however, the strategy recognises that hard engineering is always going to be necessary where there are communities at risk. Given the uncertainty at a national scale, overall effects for objective B were considered neutral.

Land use, Soil, Geology & Contaminated land
No significant effects on soil or contaminated land arising from the Strategy are anticipated. The promotion of nature-based solutions such as NFM will help reduce potential erosion of soils, release of contaminants, and therefore also contribute to reducing diffuse pollution. However, solutions that involve setting back defences, or reduced flood risk management are likely to result in increased frequency in inundation in agricultural areas, potentially meaning reduced protection of soils / soil function in some areas.

Coastal geodiversity and coastal processes could be adversely affected by continuing to hold the line of coastal defence. However, coastal adaptation and changing of SMP2 policies has the potential for adverse or beneficial effects.

Water Resources & Quality
Nature-based solutions, promoted by the Strategy, both on a coastal cell and river catchment basis, that are aligned with WFD objectives are likely to make a more significant contribution. Interventions could have benefits for the water environment in terms of water quality. For example, assets can cut-off contaminant pathways, prevent saline intrusion of groundwater bodies on the coast and nature-based solutions such as NFM and SuDS will reduce diffuse pollution from rural and urban environments. However, interventions also have the potential to alter the natural hydromorphological functions of waterbodies. This is evidenced by physical modifications resulting from flood risk management activities, amongst other things, being listed as one of the Significant Water Management Issues in the second cycle RBMP.

Climatic Factors
The Strategy is anticipated to have significant beneficial effects from objectives to manage the consequences of climate change and help Wales adapt to new climate challenges related to increases in extreme rainfall events, storm surges/intensity, increased river flows and sea level rise. However, the potential for the Strategy to contribute to mitigation of climate change factors is limited and depends on the nature of solutions proposed.

Material Assets
The effects of the Strategy on material assets are predominantly beneficial, with the management of risk to properties and businesses being part of the overarching objective of the Strategy.

Locating new developments and future assets away from flood plains and areas at risk of coastal erosion will help ensure that new material assets are not at risk, and the existing risk of flooding is not exacerbated by new development.

Cultural Heritage
Objectives to manage flood and coastal erosion risks can have significant benefits to the historic environment, by improving the level of protection, enhancing the longevity of features and reducing the cost of maintenance.

Although cultural heritage assets may not necessarily be the principle focus of prioritised investment, there are likely to be secondary benefits where heritage assets / important features lie within those areas prioritised for protection.

The construction and maintenance of FCERM assets has the potential to conflict with cultural heritage where new or existing assets are located in areas of high cultural / archaeological sensitivity. Overall the effect of the Strategy on cultural heritage is uncertain at this national scale.

Landscape & Seascape

The Strategy objectives promoting interventions have the potential to adversely affect landscape or seascape although it depends upon the nature of interventions, with hard engineering having the greatest potential for adverse effects. However, the Strategy also promotes the option appraisal continuum which will result in green engineering, NFM or hybrid options being considered where technically and economically viable.

Mitigation and Enhancement Opportunities

- Opportunities to maximise multiple benefits associated with flood risk objectives by Risk Management Authorities (RMA) working collaboratively with each other and with Public Service Boards.
- Opportunity for RMA's to engage with the Area Statement process to identify collaborative opportunities e.g. influencing land managers in priority catchments to employ measures that decrease run off.
- Opportunities to enhance public health and well-being through design and maintenance of assets that improve access along green corridors and around the coast, to encourage recreational opportunities, thereby contributing to improving health and well-being.
- The process for challenging SMP2 policies must consider and demonstrate the technical, economic and environmental implications of change and will need to include a HRA and modelling of coastal processes.
- Continuing support and contribution by all RMA's to the NHCP.
- Early and effective environmental assessment & HRA of all projects will embed SMNR and SD principles and by doing so minimise adverse effects and maximise delivery of opportunities, including the Section 6 biodiversity and resilience of ecosystems duty.
- Promotion of NFM to maximise delivery of biodiversity enhancement under Section 6 - Biodiversity and resilience of ecosystems duty.
- Lower tier strategies and projects should seek to protect and enhance high quality agricultural soils and recognise them as a finite resource.
- Implementing NFM will have direct and indirect beneficial effects on soil erosion, diffuse pollution, maintain/restore hydromorphological function of waterbodies, minimise use of non-renewable or high energy resources and minimise effects on landscape and seascape.
- Early engagement of and partnership with the relevant conservation (NRW) and heritage organisations (Welsh Archaeological Trust and/or Cadw) in the development of any plans, strategies or projects.

Cumulative Effects of the Strategy

The Strategy promotes and therefore complements the three priorities of the **Natural Resources Policy**. The need for RMA's to demonstrate consideration of nature-based solutions and resource efficiency in their strategies sets the framework for delivery of the NRP for FRM in Wales. The strong focus on RMA's working collaboratively and with local communities also reflects the place-based approach. This could be further strengthened by encouraging RMA involvement in the development of Area Statements and contributing to the delivery of Local Well-Being Plans.

The Strategy promotes and supports **Flood Risk Management Plans** (FRMP) which have been developed on a river basin basis, covering the Dee, the Severn and Western Wales. These were developed alongside the **River Basin Management Plans** (RBMP) to promote more joined up management of the water environment.

The Strategy promotes the adoption of the second-generation **Shoreline Management Plans** (SMP) policies in decision making, whether that be for lower level strategies and projects, or for planning decisions. Potential conflicts may arise in the development of a process to challenge SMP2 policies, however, this can be mitigated by ensuring that environmental implications are considered alongside technical and economical justifications.

In the summer of 2018, Welsh Government published the consultation document "**Brexit and our Land**". The document highlighted the "opportunities for networks of land managers across Wales to slow down water flow by creating or restoring floodplain woodlands, restoring peat bogs, providing land for upstream winter overflow and improving riparian habitats throughout water catchments to collectively reduce the risk of flooding to downstream communities". There is still a great deal of uncertainty around Brexit, but it is important to recognise the opportunity it could present in relation to FRM.

Assessment of alternatives

The SEA Regulations require that an environmental report includes an evaluation of the likely significant effects of the Strategy and reasonable alternatives.

The alternatives considered by Welsh Government were:

1. Do nothing – this is not considered as a reasonable alternative as the Flood and Water Management Act 2010 requires that the Strategy specifies how and when it will be reviewed.
2. Do minimum – a simple review and revision of the 2011 Strategy.
3. A new Strategy prepared in light of new legislation (Well-being of Future Generations Act, Planning Act and Environment Act) and improvements in FCERM information.

The “Do nothing” option is not considered a reasonable alternative, given the legislative requirements of the FWMA 2010.

The assessment of alternatives demonstrated that the 2011 strategy had comparable effects across all environmental receptors as the 2019 strategy. However, the 2019 strategy has greater potential for promotion of beneficial effects in three areas:

- Making evidence more accessible to promote transparent, evidence-based decisions.
- Accessible evidence will also better inform communities and influence behaviours.
- Promotion of collaborative working between RMA’s and key stakeholders.
- Promotion of NFM.

Monitoring the significant effects of the Strategy

The Flood and Water Management Act 2010, under Section 18, requires NRW to report to the Minister about FCERM in Wales, it must include information about the application of this Strategy. The Strategy sets out certain measures, for example, to report annually on the number of properties at risk of flooding in Wales. Some of these measures, such as the number of properties at risk of flooding, delivery of NFM and NHCP are relevant for the significant environmental effects identified in the SEA.
Important high-level reporting through well-being objectives of WG and RMA’s and State of Natural Resources Report (SoNaRR), prepared by NRW, will provide high level monitoring of trends and evidence of well-being and natural resource management.

The proposals for monitoring the effects of the strategy will be developed further in the preparation of the final strategy and will be published in the Statement of Environmental Particulars, alongside the adopted Strategy.

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1. Introduction

1.1 National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales

The National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales[1] herein referred to in this Environmental Report as 'the Strategy' sets the framework for managing flood and coastal erosion risks across Wales. As the climate changes we can expect those risks to increase and more communities will be affected by flooding and coastal erosion.

The Strategy is required under the Flood and Water Management Act 2010 and will replace the first strategy that was published in 2011. Since the publication of the first strategy, new legislation has been introduced that fundamentally influences how flood risk management is undertaken in Wales:

- Well-Being of Future Generations (Wales) Act 2015
- Planning (Wales) Act 2015
- Environment (Wales) Act 2016

The Strategic Environmental Assessment (SEA) aims to present the environmental effects of the Strategy and ensure that Sustainable Development (SD) and Sustainable Management of Natural Resource (SMNR) principles are embedded, maximising delivery against Welsh Governments Well-Being Objectives (Appendix 4) and the objective of SMNR. The SMNR objective is to use natural resources in a way and at a rate that… maintains and enhances the resilience of ecosystems and the benefits they provide. In doing so, this will meet the needs of present generations of people without compromising the ability of future generations to meet their needs and contribute to the achievement of the well-being goals.

The Strategy describes the roles and responsibilities of those involved in managing the risk of flooding and coastal erosion, the approaches to managing those risks and their effects, and the way funding for flood and coastal erosion risk management is allocated. It will work alongside other strategic documents to not only reduce present risk but also prevent more people being exposed to risk by making informed place-based decisions on land, water and development management. The core aim of the Strategy is:

To ensure risk to people and communities from flooding and coastal erosion are effectively managed.

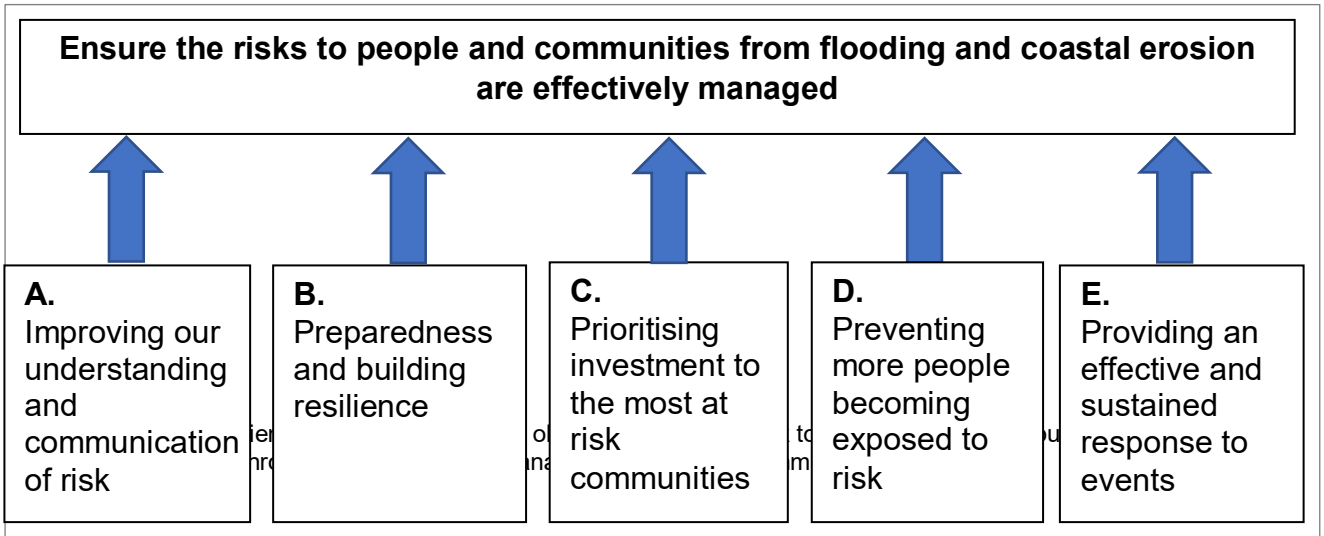


Figure 1.1 Action-orientated risk management objectives to reduce risks to people and communities form flood and coastal erosion are effectively managed

The Strategy supports this core aim through an overarching objective to reduce flood and coastal erosion risk to people, homes and businesses, delivered through 5 supporting objectives, focusing the activities of the Risk Management Authorities (RMA).

Content of the Strategy

Chapter	Summary of Content
1	Introduction to the Strategy, including strategic and legislative context, national strategy objective and measures, an introduction to the Risk Management Authorities in Wales. A review of progress since the first Strategy and a look ahead to the future of FRM in Wales.
2	An overview of flood and coastal erosion risk in Wales, including types of flooding and coastal erosion, how we deal with risk and likelihood and the implications of climate change and the potential impacts.
3	An outline of the roles and responsibilities of the Welsh Risk Management Authorities and a description of the groups and committees which help to deliver different aspects of flood and coastal erosion across Wales.
4	This chapter on Flood and Coastal Erosion Risk Management is divided into 5 sections to reflect the supporting objectives outlined in Figure 1.1 above. Each section describes the actions or measures which RMAs and others can take to help deliver those objectives.
5	The funding mechanisms, budgets, prioritisation of funding and delivery of wider benefits and funding contributions is explored in this chapter.
6	A summary of the measures outlined in Chapter 4 that are aimed at monitoring delivery of the strategy, identifying the lead RMA for each measure.

Flood and coastal erosion risk management

The term 'flood and coastal erosion risk' covers all flooding from rivers, the sea, reservoirs, ordinary watercourses, groundwater and surface water, as well as coastal erosion[1] . Flood risk assessment considers both the likelihood of events and potential impact in order to take measures and actions to mitigate and reduce risk to people, communities, infrastructure and the environment.

Flooding and coastal erosion are natural processes that will always occur, and events are likely to increase due to climate change pressures. The UK Climate Change Risk Assessment[2] published in 2017 highlighted increases in instances of coastal and inland flooding, affecting people, property and infrastructure as a risk for Wales, with higher sea levels, increases in storm intensity, rainfall events and more frequent flooding expected for Wales.

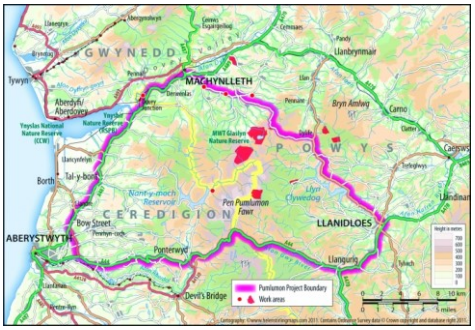
Traditional approaches to managing the risks of flooding centred mainly on the principles of drainage and defence with networks of engineered flood defences,

[1] Draft National Strategy for Flood and Coastal Erosion (2019)
[2] https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Wales-National-Summary.pdf

coastal protection and drainage infrastructure. However, with extreme climate change impacts expected to significantly increase pressure on our existing infrastructure, a new integrated approach, combining natural flood management (NFM) methods with traditional solutions is now considered essential to protect communities and deliver effective flood risk strategies.

In practice this means adopting a combined approach for drainage and defence that incorporates the adoption of sustainable alternatives for long-term solutions to reduce both the likelihood of an event occurring and the consequences of those events. More innovative approaches are now required and combining several different, hybrid options may often be most optimal (Figure 1.2). Examples of alternative sustainable options include: utilising the natural environment such as wetlands or salt marshes, incorporating greater resilience into the design of developments, deploying sustainable drainage systems much more widely, identifying areas suitable for inundation and water storage, enhancing and restoring floodplains and hydrogeological systems to reduce flood risk and improve water quality and quantity, supporting people in taking actions to make their buildings, land and activities more resilient to flooding and ensuring wider awareness of individual risk to increase levels of preparedness and planning for flooding events.

Figure 1.2: Pumlumon Project, Montgomeryshire: Across 40,000 hectares of the Cambrian Mountains, an upland economy is being pioneered, built around long-term sustainability. Established in 2007, the Pumlumon Project is a radical rethink of how the landscapes and natural processes of upland Britain could offer sustainable flood risk management solutions. Partners: NRW, Welsh Government and Montgomeryshire Wildlife Trust



Catchment map illustrating Pumlumon project boundary and work areas.

Flood water storage

AIMS: A large-scale ecological restoration project to revive the ecology and economy of the Welsh uplands. The primary aims are to increase flood water storage, reduce runoff potential and sediment loss to water courses, whilst also providing wide-reaching environmental catchment benefits.

DELIVERY: Increasing flood water storage is a central objective of the project and achieved by working with natural processes measures including peat regeneration, moorland grip-blocking and creation of flood storage areas. The water table was raised by a minimum of 5cm across the area.

BENEFITS: The project has resulted in:

- Significant reductions in flood peaks in surrounding catchment lowlands.
- The peatbog restoration serves as an important carbon storage.
- Wide reaching catchment benefits: habitat creation and connection, increases in biodiversity with wildlife returning to the area and development of green tourism.

Underpinning the practical implementation of flood and coastal erosion risk management is the Welsh Government's commitment to sustainable development, in terms of well-being, as a core organising principle. The Strategy ensures that actions to deliver an effective flood and coastal erosion risk management system in Wales are environmentally sustainable and that we work together with natural processes to build and develop natural ecosystem resilience and adaptation capacity into our environment.

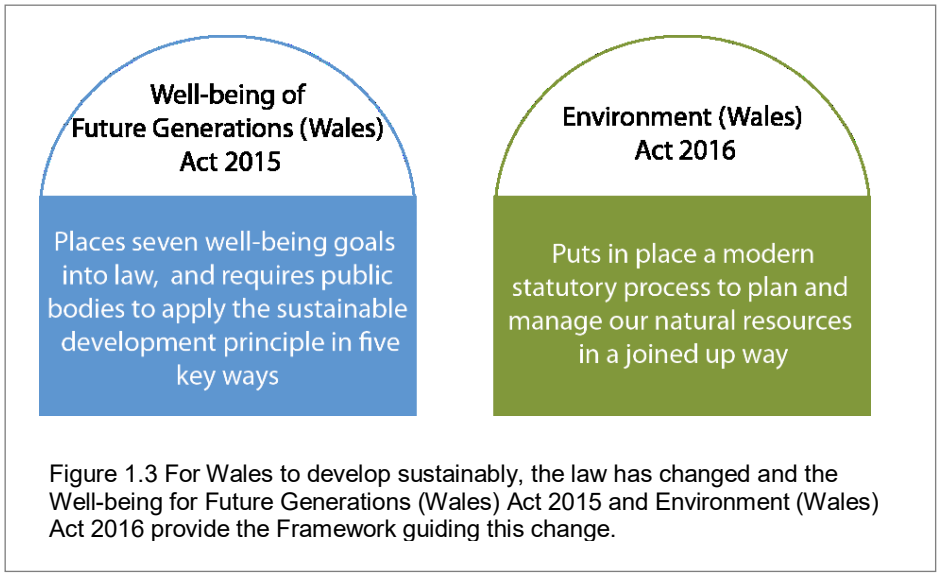


Figure 1.3 For Wales to develop sustainably, the law has changed and the Well-being for Future Generations (Wales) Act 2015 and Environment (Wales) Act 2016 provide the Framework guiding this change.

Embedding Sustainable Management of Natural Resources (SMNR) and Sustainable Development (SD) into the Strategy

The Strategy has been developed within the context of the Wellbeing of Future Generations Act[3] and the Environment (Wales) Act[4] (Figure 1.3). Sustainable development is a key principle that has underpinned the Strategy development and this SEA has aimed to influence the development of the Strategy to maximise opportunities and minimise adverse effects.

[3] Well-being for Future Generations (Wales) Act 2015: https://gov.wales/topics/people-and-communities/people/future-generations-act/?lang=en
[4] Environment (Wales) Act 2016: https://gov.wales/topics/environmentcountryside/consmanagement/natural-resources-management/environment-act/?lang=en

The Strategy must maximise delivery under Welsh Government's Well-being Objectives, to contribute to the seven well-being Goals as outlined in the Wellbeing of Future Generations Act 2015 and embedded in the Environment (Wales) Act 2016. By doing this, the Strategy will set the framework for RMA's to continue this approach and work together in a collaborative and cohesive way to mitigate and reduce flood risk in Wales and in doing so, deliver under their own well-being objectives to improve the social, economic, environmental and cultural well-being of communities (Figure 1.4).

The Environment (Wales) Act 2016 established the objective of sustainable management of natural resources (SMNR): "...using natural resources in a way and at a rate that maintains and enhances the resilience of ecosystems and the benefits they provide. In doing so, meeting the needs of current generations without compromising the ability of future generations to meet their needs, and contributing to the achievement of the well-being goals set out in the Well-being of Future Generations (Wales) Act 2015".

The nine principles for the sustainable management of natural resources are closely aligned to the Sustainable Development Principles. The application of these principles to flood risk and coastal erosion management, encourages long-term thinking, a preventative approach, and working collaboratively with others to sustainably manage and reduce risks to communities in Wales with the objective of maintaining and enhancing the resilience of ecosystems (Figure 1.5).

Welsh Government developed the Natural Resources Policy as required by the Environment (Wales) Act 2016. The policy sets out the national priorities for the sustainable management of natural resources and are the key ways in which natural resources contribute across all well-being goals. The national priorities are:

- Delivering nature-based solutions
- Increasing resource efficiency and renewable energy
- Taking a place-based approach – working locally in a joined-up way

They aim to address the challenges and realise the opportunities associated with our natural resources. The management of our water as a natural resource means these priorities are at the heart of the Strategy.

Figure 1.4 National well-being goals and key priorities for delivery of Well-being of Future Generations (Wales) Act 2015.

Figure 1.5 The Environment (Wales) Act 2016 puts in place nine principles for the sustainable management of natural resources.

Environment (Wales) Act also recognises the essential contribution biodiversity makes to SMNR and our well-being, by putting in place the section 6 - Biodiversity and ecosystem resilience duty. This duty requires public authorities (RMA's) to seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in doing so promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions.

Biodiversity and healthy resilient ecosystems mitigate the impacts of climate change by providing protection against environmental extremes including both flooding and drought (Case study Figure 1.6). Protecting and enhancing ecosystem biodiversity is therefore the vital cornerstone to ensuring ecosystem survival and the provisioning, regulating, cultural and supporting services they provide.
The SEA is well aligned with the SD and SMNR principles and so it is being used to not only assess the environmental effects of the Strategy but is a valuable tool to demonstrate how the Strategy is delivering and promoting:

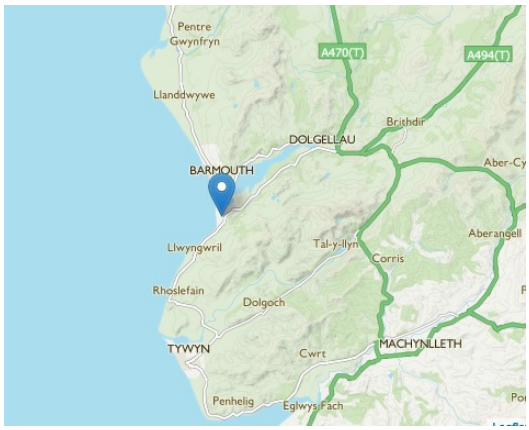
- SMNR,
- The national priorities of the Natural Resources Policy,
- Section 6 - Biodiversity and ecosystem resilience duty

and in doing so, contribute to the wellbeing objectives and goals.

Figure 1.6 Case study: Fairbourne 'Brickpits' Wetland Habitat Creation

At risk from both tidal flooding and fluvial flooding from the Afon Henddol, Fairbourne- a village in West Wales has seen major benefits delivered via a NRW scheme to implement sustainable flood risk solutions whilst enhancing and conserving local biodiversity. The Scheme was future-proof designed by allowing for predicted climate change pressures over the next 50 years and has been awarded a "Best Practice" CIEEM award for nature conservation. Partners: NRW, supported by Black & Veatch Ltd and Galliford Try.

Location:



Major Scheme Initiatives:

- Completed in 2015, the scheme involved strengthening 1.8 miles of the tidal defences at Fairbourne and Arthog, and rebuilding the river Henddol and Morfa outfalls to provide better control of flood water
- A new channel was created for the river Henddol to divert storm flows and floodwater away from the village during high river flows

Benefits:

- NRW's £6.8million scheme protects over 400 properties in Fairbourne from potential tidal flooding from the Mawddach estuary. The scheme also defends Fairbourne from river flooding
- Greater floodplain water storage in the channel that contributes to flood protection
- The reinstatement of natural habitat at Brickpits has led to greatly improved and enhanced biodiversity, and community resources
- Wider ecosystem service benefits: water regulation, carbon storage, environmental resilience, recreation and amenity services
- 5ha of Biodiversity Action Plan habitat was created plus other Amenity enhancements: 2ha of Lowland Meadow habitat, 3.8ha of floodplain grazing meadow and 4 lagoons
- The grassland has been left to recolonise naturally to support regulatory function and enhance local native species

A Habitats Regulations Assessment is being developed iteratively with the Strategy and the SEA and will be published in a separate draft report alongside the draft Strategy. Natural Resources Wales will continue to be engaged in the development of the HRA.

1.2 Purpose and structure of this SEA Environmental Report

A Strategic Environmental Assessment (SEA) is a legal requirement under Directive 2001/42/EC “on the assessment of the effects of certain plans and programmes on the environment” (the SEA Directive). The SEA Directive is implemented in Wales by the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004. The Welsh Government has determined that the Strategy requires SEA.

The purpose of SEA is:
1. To integrate environmental considerations and high-level protection of the environment into strategic decision-making.
2. To ensure the integration of environmental considerations into the preparation and adoption of plans and programmes, and to contribute to the promotion of sustainable development and environmental protection.

The SEA process is structured into five well-defined stages as outlined in Figure 1.7 and involve predicting, evaluating and mitigating the environmental effects of the Strategy.

Stage A and the associated tasks were reported in the Scoping Report that preceded this Environmental Report. During this scoping stage, the environmental baseline was considered in the context of current status and trends to allow identification of key issues relevant to the Strategy. As part of this process, relevant policies, plans, programmes and legislation were reviewed to determine potential synergies and conflicts with the Strategy. A summary of this baseline information is presented in Section 3.2 of this report. Air quality was the only topic scoped out, on the basis that policies, measures and actions arising from the FCERM strategy are considered unlikely to generate significant impacts on air quality.

The Scoping Report was subject to statutory consultation with Welsh Government, Natural Resources Wales and Cadw in October 2018 for a period of 5 weeks. Annex A of this Report summarises the Scoping Report consultation responses and how they have been actioned.

This report documents Stages B and C in the SEA process and specifically:

- Identifies, describes and evaluates the significant environmental effects of implementing the Strategy and any alternatives
- Identifies actions to prevent, reduce or as fully as possible offset any adverse effects
- Provides an early and effective opportunity to engage through consultation in preparation of the Strategy
- Proposes measures to monitor the environmental effects of strategy implementation

Stage D will involve consultation on the draft FCERM Strategy and Environmental Report, which will further develop the Strategy. Implementation and Monitoring (Stage E) will be an ongoing process for the duration of the Strategy to ensure adaptation and continual improvement.

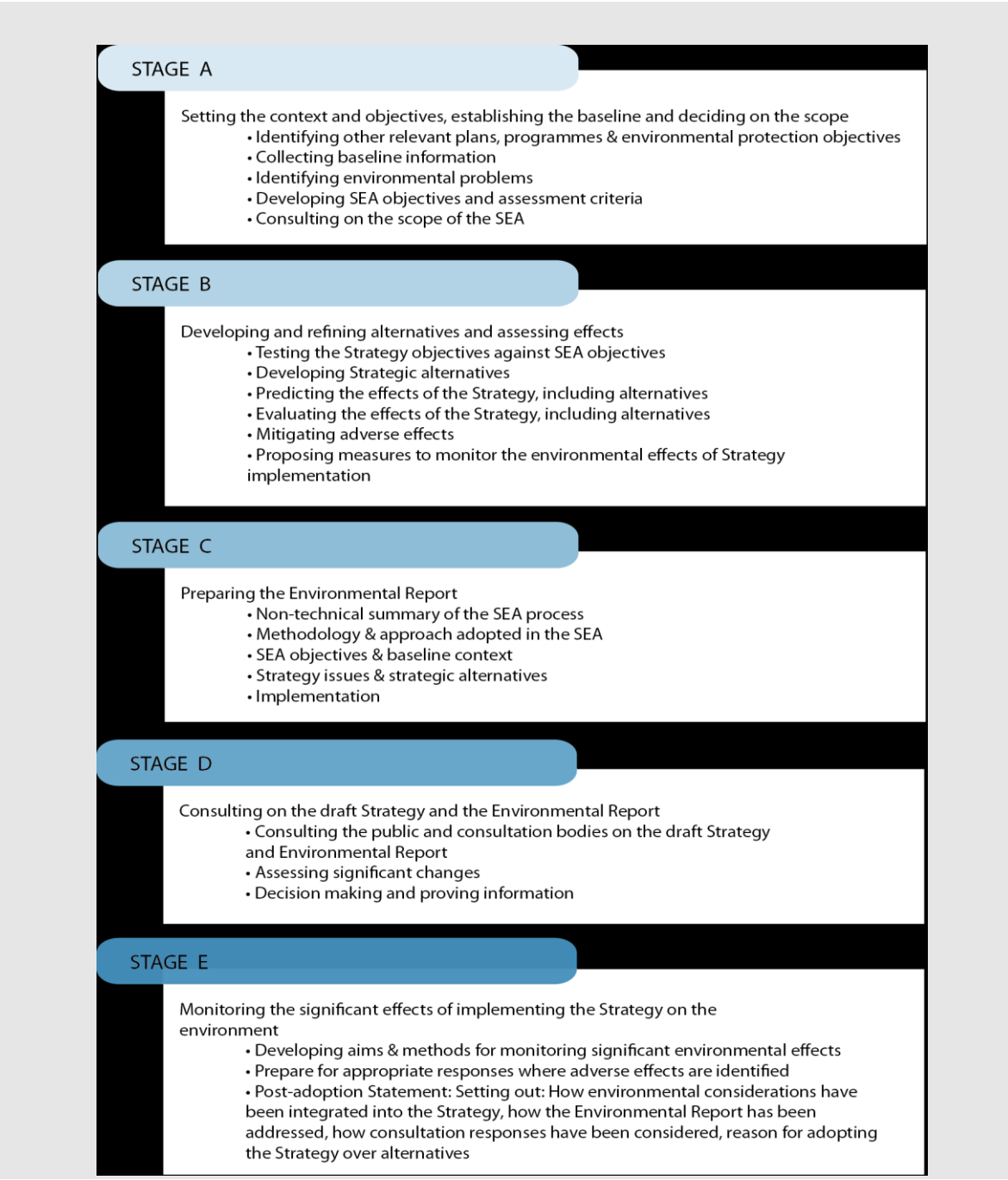


Figure 1.7 Required and implemented stages in the SEA process

1.3 How SEA regulation requirements have been addressed in this Environmental Report

Table 1 Environmental Report Requirements:

SEA regulation requirements	How this has been addressed	Report section
1. An outline of the contents and main objectives of the Strategy, and of its relationship with other relevant plans and programmes.	Section 1.1 sets out the main objectives and an outline of the content of the Strategy. Section 3.1 & 3.2 sets out the relevant key themes arising from a review of relevant plans and programmes. A full list of plans reviewed is provided in Appendix 1.	1, 3.1 and Appendix 1
2. The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the Strategy.	The environmental context for the Strategy was documented and consulted on in the Scoping Report and an amended and summarised version is presented in Section 3.2. This includes an overview of the current state and trends in the absence of the plan.	3.2
3. The environmental characteristics of areas likely to be significantly affected.	The assessment of effects on environmental receptors is documented in Appendix 3 and summarised in Section 4	4 & Appendix 3
4. Any existing environmental problems which are relevant to the Strategy including those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds(a) and the Habitats Directive.	Existing environmental problems are presented as part of the baseline in Section 3. Consideration of designated sites (SAC, SPA and Ramsar sites) is presented in the Habitats Regulations Assessment and summarised in Section 4 and Appendix 3.	3, 4, Appendix 3 and Habitats Regulations Assessment
5. The environmental protection objectives, established at international, Community or Member State level, which are relevant to the Strategy and the way those objectives and any environmental considerations have been taken into account during its preparation.	Environmental protection objectives are summarised as part of the review of relevant plans and programmes in Section 3.1 & Appendix 1	3.1 and Appendix 1
6. The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects.	The likely significant effects of the plan are described in Section 4 and Appendix 3.	4 and Appendix 3

7. The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the Strategy.	Mitigation measures and opportunities for additional environmental improvements are provided in Sections 4, 5 and Appendix 3.	4, 5 and Appendix 3
8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	Section 2.1 sets out the approach to assessing the Strategy, including difficulties encountered. Section 2.2 sets out the alternatives considered and the justification for the alternative presented in in Section 4.	2.1 & 2.2, 4
9. A description of the measures envisaged concerning monitoring.	Proposals for monitoring are provided in Section 5	5
10. A non-technical summary of the information provided under paragraphs 1 to 9.	A non-technical summary is provided at the front of this document.	

1.4 Consultation on the draft Strategy and SEA to date

The draft Strategy consultation document will be issued via the Welsh Government website:
https://gov.wales/consultations

Regulation 12(5) of the SEA Regulations requires consultation with the consultation bodies on the scope and level of detail of the SEA. An SEA scoping report was produced in October 2018 and consulted with colleagues in Welsh Government, Cadw and Natural Resources Wales, and the relevant transboundary consultation bodies, the Environment Agency, Historic England and Natural England were also consulted. A summary of the key points raised and how we responded is detailed in Appendix 2.

1.5 How to comment on the Environmental Report and draft Strategy

We have developed a series of consultation questions, to assist you in providing a consultation response via https://gov.wales/consultations

1) Are there any other key issues or trends that you think should be considered in the SEA?

2) Are there additional environmental effects (including those on humans) that need to be considered when developing the Strategy?

2. Assessment Method

2.1 Approach to assessing the Strategy

Regulation 12 of the SEA Regulations requires that the assessment process identifies, describes and evaluates the likely significant effects on the environment of implementing the Strategy and reasonable alternatives with respect to the objectives and the geographical scope.

Given the high-level nature of the Strategy and the strategic nature of the actions it is not possible to assess the effects with significant accuracy or precision. The assessment has therefore focused on the likely changes resulting from the Strategy but has not attempted to quantify them. Assessment criteria have been developed to focus the assessment on key environmental outcomes.

Whilst the assessment has been undertaken at a high level, we have sought to present it in a manner that can be applied to, and influence, lower level plans, strategies or even project level EIA. It is for this reason that the assessment in Appendix 3 focuses on each specific Strategy objective, to allow RMA's to easily avoid or reduce negative effects and maximise positive effects when delivering under the objectives. Then, the assessment is summarised in Section 4, including drawing together the cumulative effects, and how the Strategy contributes to Welsh Governments well-being objectives and the priorities set out in the Natural Resources Policy.

2.2 Assessment of alternatives

The Strategy is giving effect to the requirements of the Flood and Water Management Act 2010, and it provides a framework for more specific actions to be implemented by the Risk Management Authorities. Given the need to comply with the requirements of the Act, the stated objectives of the Strategy, and the 'high level' framework provided by the Strategy, we consider that there are limited alternatives that would result in materially different environmental effects.

The alternatives considered by Welsh Government were:

1. Do nothing – this is not considered as a reasonable alternative as the Flood and Water Management Act 2010 requires that the Strategy specifies how and when it will be reviewed.
2. A simple review and revision of the 2011 Strategy.
3. A new Strategy prepared in light of new legislation (Well-being of Future Generations Act, Planning Act and Environment Act) and improvements in FCERM information.

Alternatives 2 and 3 listed above will be evaluated for their likely significant effects on the environment in Section 4.

The consideration of alternatives will be a significant factor in the SEAs of local strategies that are developed in accordance with the requirements of the Strategy. Monitoring of the effects of the Strategy may help to identify other alternatives that should be considered in subsequent reviews.

2.3 Scope of the Assessment

2.3.1 Scoping the environmental receptors

Scoping the assessment took into account the key environmental issues and trends across all SEA receptors and determined which were relevant to the Strategy (summarised in Section 3). It also reviewed policies, plans, programmes and legislation relevant to the Strategy. This information was used to develop assessment objectives and associated criteria, which are typically used in SEA to systematically identify the beneficial and adverse effects of a plan on individual environmental issues. We proposed a series of assessment objectives and criteria in the scoping report, against each of the environmental receptors. These were reviewed in light of scoping consultation responses.

The SEA receptors, objectives and how they relate to the relevant Welsh Government Well-being Objectives are outlined in Figure 2.1.

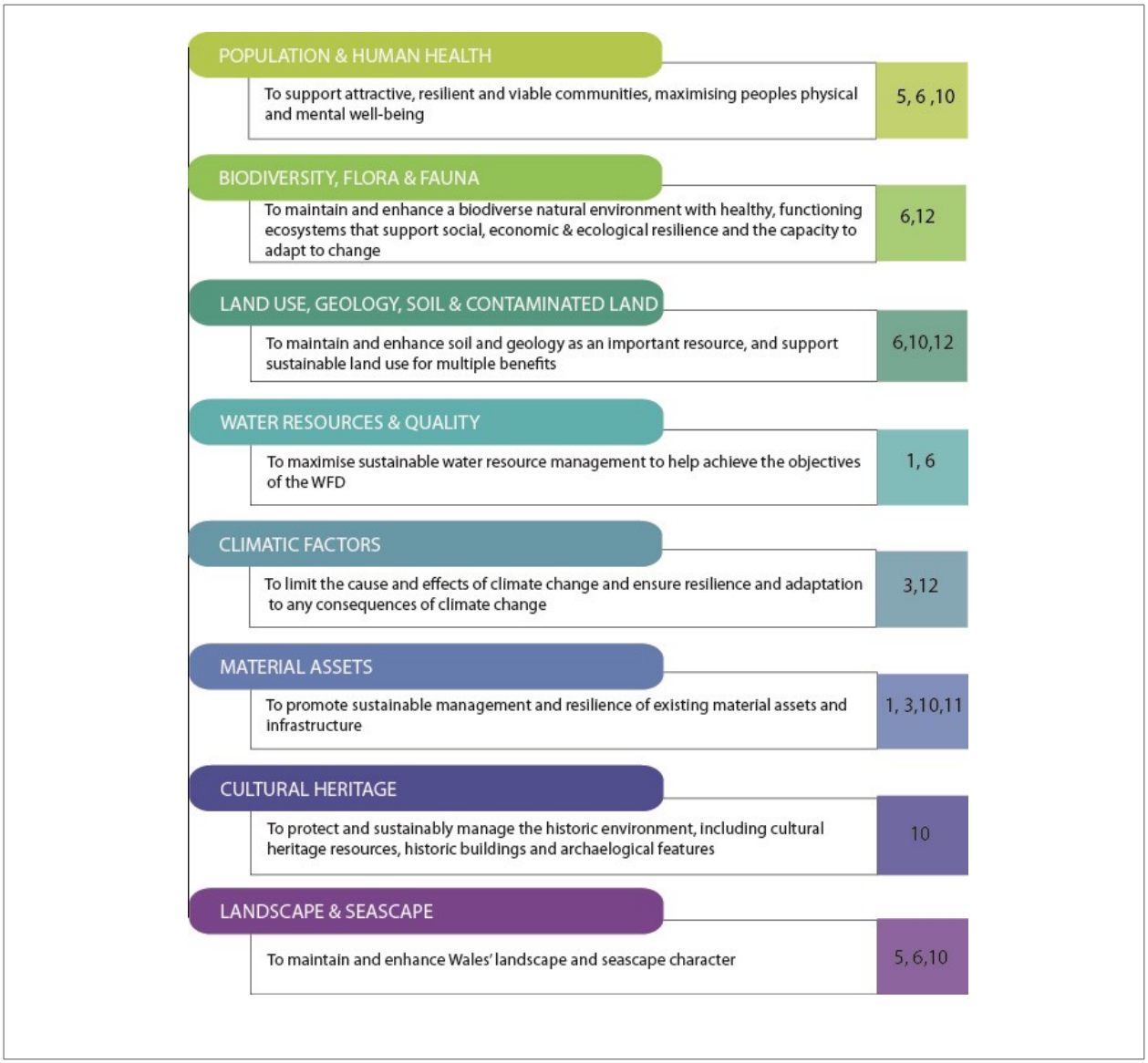


Figure 2.1 Environmental receptors/topics, respective objectives and the relevant Welsh Government Well-being Objectives for Wales (Appendix 4) that these objectives help to achieve.

The assessment criteria related to each environmental receptor are presented in Table 2 below.

Table 2: Assessment criteria used in the assessment of the National FCERM Strategy

Environmental Receptor/ Topic	**Assessment criteria** ***Does the proposed objective…***
Population and Health	• Maintain and enhance the health and well-being of communities? • Reduce levels of social, cultural and economic deprivation? • Reduce inequalities across the life course? • Maintain and enhance recreation and access opportunities?
Biodiversity, Flora and Fauna	• Help to maintain and enhance internationally and nationally designated sites, with the aim of restoring them to favourable condition? • Help to maintain and enhance the: Diversity, Condition, Extent and Connectivity of ecosystems, hence increasing ecosystem resilience and adaptability? • Help to maintain and enhance Wales' priority habitats and species?
Land Use, Geology, Soil and Contaminated Land	• Protect and Conserve soil quality and function (including carbon sequestration) and increase resilience to degradation? • Help to protect and avoid damage to Wales' geodiversity?
Water Resources & Quality	• Contribute to the protection and improvement of the water environment, for the benefit of the human and/or natural environment?
Climatic Factors	• Promote a reduction directly or indirectly, in greenhouse gas (GHG) emissions as a contribution to climate change? • Contribute to Wales' ability to adapt to climate change?
Material Assets	• Conserve and protect important material assets and infrastructure? • Increase the resilience of important material assets and infrastructure to climate change?
Cultural Heritage	• Conserve and where possible enhance, protected and important cultural heritage assets?
Landscape & Seascape	• Ensure the landscape and seascape character of Wales is conserved and, where possible, enhanced?

A key consideration in determining whether an environmental issue should be assessed was the likelihood of the Strategy resulting in significant environmental effects (as described in Schedule 2 (paragraph 6) of the Regulations). Given that the Strategy is focused at the national scale, and includes no location or area specific actions, likely significant national impacts have been the primary focus.

We considered that the Strategy would be unlikely to have significant effects on air quality and hence these issues were scoped out of the assessment. However, 'air quality' should not be discounted from lower-tier strategies, plans or projects, where air quality issues may occur that may be significant at that regional/or local scale, and must therefore be considered as part of the SEA/EIA process at that level.

2.3.2 Assessment of significant effects

The assessment process identifies the significant environmental effects of the Strategy. Due to the national strategic nature the draft plan, effects on local environmental issues were not considered significant within the context of this assessment and are not considered further.

At this high level of assessment all impacts are considered to have a significant level of uncertainty associated with them and we have therefore only considered whether the impacts are likely to be significantly positive or negative. We have not sought to define levels of significance.

The national and high-level nature of this strategy means that it is not possible to provide definitive criteria to determine the significance of an impact. However, an indication of the characteristics of significant impacts can be provided:

- Effects that are likely to result in an adverse effect on the integrity of features of national or international value or will demonstrably increase the extent or improve the value of such features
- Effects that are likely to conflict with environmental legal objectives, goals or duties.
- Effects that are likely to result in a demonstrable change in the health and/or social or economic well-being of communities.

2.3.3 Scoping the Strategy

The Strategy sets out the approach to managing flood and coastal erosion risk under a series of overarching objectives (A-E) for flood and coastal erosion risk management in Wales:

A. Improving our understanding and communication of risk
B. Preparedness and building resilience
C. Prioritising investment to the most at risk communities
D. Preventing more people becoming exposed to risk
E. Providing an effective and sustained response to events

These Strategy objectives have provided the basis for this assessment. During the SEA scoping process, it was determined that not all elements of these objectives were likely to result in pathways to environmental effects. For example, the Strategy promotes flood and coastal risk mapping to communicate flood risk, which in itself could not have any pathway for environmental effects and so was scoped out of the assessment.

To allow us to focus the SEA on the elements of the Strategy that have the potential for environmental effects we split the elements of each objective into sub-objectives, for the purpose of the SEA. The objectives, sub-objectives, whether they have been scoped in or out of the assessment and the justification for this decision is presented in Table 3 below.

Table 3: Scoping of the Strategy objectives and sub-objectives

Strategy Objectives	Scoped in	Justification
1. Improving our understanding and communicating flood risk		
a. The Strategy promotes flood and coastal erosion risk information mapping to fully understand and communicate the risk to the people of Wales.	X	Measures to map and model flood risk will not have an effect on the environment. The maps will influence development decisions and funding, but this is covered under the Objective 4, below.
b. The Strategy makes a commitment to utilise the Flood Risk Assessment Wales and Communities at Risk Register, as the best source of evidence on flood risk, to develop the second cycle of Flood Risk Management Plans (FRMP). The Strategy recognises Shoreline Management Plans (SMP) as live documents that should be reviewed and amended where more current or detailed evidence is available. Measure to develop a process for challenging SMP policies.	✓	The FRMP and SMP are / were subject to SEA and HRA. This sub-objective sets a strategic direction for lower tier plans and introduces a process for challenging SMP policies that could have an effect on the environment.
c. Coastal Monitoring.	X	Monitoring activities will not have an effect on the environment.

2. Preparedness and building resilience		
a. Community resilience to flooding, how it responds to and recovers from a flood event. Working on behavioural change to encourage households and businesses to understand and manage their flood risk. Actions will involve preparation of flood plans, additional flood awareness and outreach work with communities, residents, businesses and schools.	X	Measures are related to raising awareness and engaging communities. These actions will not have an effect on the environment.
b. Awareness raising. Understand risk and prepare accordingly	X	Measures are related to raising awareness and engaging communities. These actions will not have an effect on the environment.
3. Prioritising investment to the most at risk communities		
a. The Strategy promotes interventions to reduce flood risk, prioritising investment according to risk using the Communities at Risk Register (prioritising homes over business) and evidence of flood events, alongside supporting information on properties and wider benefits.	✓	Measures to implement a programme of improvement works in line with investment priorities, could have pathways for environmental effects.
b. Interventions should utilise the option appraisal continuum (no intervention, NFM through to grey (hard) engineering). Hybrid options may be necessary, but the Strategy encourages more interventions that work with natural processes. New appraisal guidance requires at least one NFM option to be included in each business case.	✓	Interventions to manage flood risk could result in environmental effects. The solutions promoted will determine the nature of effects, e.g. opportunities for positive environmental effects through nature based and catchment solutions.
c. NFM opportunity maps have been published and the strategy encourages their use in developing catchment-based approaches with RMA's and partners.	X	The promotion of the use of NFM opportunity maps in developing catchment-based approaches, in itself, will not have an effect on the environment.

d. Continue research and monitoring in to NFM to further develop the approach and improve understanding of impact and effectiveness. Encourage RMA's to share experiences.	X	Research and monitoring activities will not have an effect on the environment.
e. The Strategy acknowledges the importance of hard engineering in flood alleviation but encourages green/grey interventions to improve the function, biodiversity and aesthetics of assets.	✓	Interventions to manage flood risk could result in environmental effects. The solutions promoted will determine the nature of effects.
4. Preventing more people becoming exposed to risk		
a. Managing development flood risk - The Welsh Government's policy of directing development away from areas at high risk of flooding and managing water is set out in Planning Policy Wales and Technical Advice Note (TAN) 15 which is being updated alongside this Strategy.	✓	Measures will seek to influence and inform planning policy, Local Development Plans and strategic policy which could have an impact on the environment in the future, depending upon policy decisions.
b. SuDS are a requirement on all new developments from January 2019.	✓	Interventions such as SuDS could result in environmental effects.
c. Coastal adaptation – SMPs are a material consideration in planning and in Local Development Plans.	✓	Objective requiring coastal adaptation could have environmental effects.
d. RMA's must consider how they can adapt management of the coast in light of climate change predictions and raise awareness and work with communities affected, particularly where SMP policies change from hold the line to managed realignment or no active intervention.	✓	Objective requiring coastal adaptation could have environmental effects.
e. NHCP continues to monitor and predict coastal squeeze impacts on intertidal habitats and European sites. It also aims to deliver projects to proactively deliver compensatory	✓	Delivery of a programme of projects aimed at managing and creating habitat could result in environmental effects.

habitat to allow RMA's to manage flood risk in coastal communities.		
f. Asset maintenance – programme for regular maintenance of assets.	✓	Maintenance of flood risk assets could have environmental effects.
5. Providing an effective and sustained response		
a. Production of response plans to plan and train for flood events in high risk communities	X	Actions are unlikely to have an effect on the environment: Emergency response planning, medical treatment, providing accommodation, insurance, resilience, evacuations, flood warnings and recovery.
b. Review – investigating, reporting and learning from flood events.	X	Research, investigations and review of flood events would not have an effect on the environment.
c. Section 19 reporting following a flood event reports on the full impact of the event and can help us learn from events and improve our understanding of flood risk.	X	Section 19 reports are a reporting mechanism. They may be used as evidence towards future interventions, but in themselves, will not direct any interventions.

3. The Environmental Context

3.1 Policy, plan and legal context

The SEA Regulations require that consideration is given to the relationship with other policies, plans, programmes and environmental objectives set at an international, (European) community or national level. Given the national context of this Strategy, this review has considered relevant national policies, plans, programmes and legislation. Table 4 sets out the key themes arising from the policy review. The purpose of the review is to align the Strategy to compliment and work with other environmental policies and legislation rather than against them. The plans and programmes most relevant to the development and implementation of the Strategy are briefly summarised below and listed in Appendix 1. Details of the review were set out in the Scoping Report and consulted upon. Responses have been taken into account in revising the review.

Table 4. Common Themes and influences from the Policies, Plans, Programmes and Legislation Review

Category of Policy, Plan, Programme, Legislation	Common themes
Water and flood risk management	Protection, improvement, sustainable management and use of the water environment (surface ground, estuarine and coastal waters), in terms of quantity and quality – for the benefit of the human and natural environment / wildlife.
Marine and Coastal	Sustainable development and integrated management of coastal areas, balancing the mixed uses of the coastal environment such as nature conservation, fisheries, navigation, recreation and access, and coastal protection. Aims to complement planning policy to reduce the risk of new development to coastal change and restrict inappropriate development.
Biodiversity and conservation	Protection and enhancement of important habitats and species, both from a statutory basis (International and National conservation designations and priority habitats and species listed under Section 7 of the Environment Act) and through policy objectives, such as for healthy functioning and resilient ecosystems.
Land Use, Geology, Soil and Contaminated Land	Long term protection, sustainable management and improvement of soils and high quality (ALC 1,2,3a) agricultural land. Contaminated land issues and links to pollution of the water environment. Consideration of soil management and agricultural practices as a potential FCERM mitigation measure.
Climate / Climatic factors / Air quality	Long term aims for reduction of carbon dioxide emissions including binding targets, and wide-reaching policies across all sectors to deliver these reductions. Requirements to adapt to climate change and associated threats, the need for increased resilience to climate change.
Economy and sustainable development	Sustainable economic development, for the benefit of the economy, communities and the wider environment.
Planning, transport and infrastructure (material assets)	Aims to complement planning policy to restrict inappropriate development in flood risk areas and promote regeneration. Improvement and sustainable development of public services, and management of transport networks.
Population and human health	Improved health, wellbeing and standard of living and the reduction of inequalities. Prosperous, healthy and sustainable local communities. Provision and enhancement of public access and recreation, protection of open spaces and recreational areas.
Cultural Heritage	Sustainable development in relation to historic assets through conservation and enhancement.
Landscape	Legislation and policy to protect existing sensitive landscapes (such as National Parks and AONBs), and to promote the enhancement of natural beauty and amenity of inland and coastal waters.

3.2 Environmental baseline

This section of the report presents an overview of the existing state of the environment, particularly aspects of relevance to the Strategy. The information presented in this section is a summary of that documented in the scoping report, amended following consultation. It is at a strategic level, appropriate to the national scale of the Strategy and is broadly set out according to the environmental receptors, as set out in the SEA Regulations.

Summary of Environmental Baseline

1.Population and Health

The current resident population estimate of Wales (June 2017) is 3,125,000, a 2% increase since the 2011 consensus, with projected increases of 4.6% by 2041. Such increases will result in unprecedented pressures on housing – with associated water and waste services and increases in emissions adversely affecting the environment.

Over 60% of the population are living and working at the coast with associated vulnerabilities to coastal flooding and erosion. In 2013, 208,500 properties (148,150 residential, 60,350 non-residential) were at risk from flooding from rivers or the sea and this number is expected to rise with impacts from climate change.

All flood events carry a risk to life, either for those directly affected or for others involved in emergency services and assistance. The dangers of flood waters cannot be overstated. However, beyond the risk to life there are other impacts associated with flooding including health impacts from water and contaminant exposure, and long-term mental health impacts. A recent study by Public Health England[5] recorded a significant association between displacement due to flooding and symptoms of depression, anxiety and post-traumatic stress one year after flooding.

Issues relevant to the Strategy

- Early strategic involvement, and influence in the planning process, for example through the effective application and integration of national planning policy on flood risk (TAN15) can help to manage flood risk implications and contribute to sustainable communities / reduce inequalities.
- Flooding affects human health, both physically and mentally, and impacts on some vulnerable communities may be greater.

[5] Munro, A et al, Effect of evacuation and displacement on the association between flooding and mental health outcomes, 2017 Lancet Planet Health: https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(17)30047-5/fulltext

- Flood risk management infrastructure, such as flood defence bunds, can improve access along green corridors and around the coast to encourage recreational opportunities, thereby contributing to improving health.
- Flood risk management can enhance the physical environment in deprived areas to deliver social justice in protecting people and places and support sustainable communities[6].

Likely evolution without the Strategy

- Climate change is likely to increase the risk of flooding and coastal erosion, with sea level rises, increased intensity of storm events and increase in peak river flows, leading to increased impacts to human health and communities.
- The risk to health (and life) through not implementing any Strategy or enabling any associated flood programme is significant.
- Even without any increase in risk from climate change, the risk to people would still rise dramatically when existing assets come to the end of their working life.

2. Biodiversity, Flora and Fauna

Biodiversity underpins ecosystem resilience and the sustainable management of natural resources and provides natural solutions to support both human well-being and increases ecosystem adaptation capacity to climate change. Working towards ecosystem resilience goes hand in hand with our Section 6 - Biodiversity and resilience of ecosystems duty to maintain and enhance biodiversity.

Legislation (both national and international) designates approximately 30% of the land and water in Wales as protected conservation sites either for the habitats, wildlife, their scenic beauty or their geological value. Wales has extensive biodiverse and economically significant semi-natural grassland, heathland and peatland habitats, in addition to extensive coastal habitats of sand dunes, saltmarsh, mudflats, reedbeds and sea cliffs important for nature conservation, and regulating services. The condition of the habitats and species of European Sites in Wales remains mostly unfavourable.

Invasive Non-Native Species (INNS) can directly impact on FCERM by affecting how we manage our watercourses and assets and indirectly through deforestation when it is required due to disease, for example where Rhododendron, an INNS, that is susceptible to Phytophthora infection, then spreads to trees.

Issues relevant to the Strategy

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291071/se2-067-1-tr-e-e.pdf

- Biodiversity and nature conservation legislation can place significant constraints in terms of how we manage flood and coastal erosion risk, and place statutory obligations to which we must comply.
- Coastal flood risk management can result in short term effects on habitats through the delivery of projects and long term inter-tidal habitat losses due to coastal squeeze.
- The biodiversity and ecosystem resilience duty (Section 6 of Environment (Wales) Act) placed on public authorities requires RMA's to seek to maintain and enhance biodiversity in the exercise of their functions and to promote and take account of the resilience of ecosystems.
- The Strategy presents the opportunity to use nature-based solutions such as NFM and green engineering to help maintain and enhance ecosystem biodiversity, condition and connectivity, thereby building natural ecosystem resilience to protect against environmental pressures such as climate change.
- Sustainable flood risk management has the potential to contribute to Prioritised Improvement Plans and Thematic Action Plans, aiming to restore habitats and species to favourable condition.

Likely evolution without the Strategy

- Potential adverse effects on biodiversity such as intertidal habitat losses from climate change and coastal squeeze.
- Potential degradation and fragmentation of habitats, threatening the survival of species and resulting in declining biodiversity.

3. Land Use, Geology, Soil & Contaminated Land

Wales covers an area of 20,000 km^2 with the predominant land use being agricultural (87%) of which a higher proportion is grazing land compared to arable farming. The most productive lowlands are more susceptible to flood risk, with associated productivity implications.

In the summer of 2018, Welsh Government published the consultation document "Brexit and our Land". This is only at consultation and so cannot be considered in the strategic context review undertaken for this SEA. However, the document highlights the "opportunities for networks of land managers across Wales to slow down water flow by creating or restoring floodplain woodlands, restoring peat bogs, providing land for upstream winter overflow and improving riparian habitats throughout water catchments to collectively reduce the risk of flooding to downstream communities". There is still a great deal of uncertainty around Brexit, but it is also important to recognise the opportunity it could present in relation to FRM.

Forests and woodlands in Wales form 14% of land cover with a further estimated 15 million trees found outside woodlands. As important biodiverse ecosystems, woodlands provide habitats for a wide variety of flora and fauna, in addition to delivering significant regulating services: maintaining and restoring landscape quality, protecting soils and river catchments, carbon sequestration and improvements to air quality, all critically important with respect to the growing

climate change pressures[7]. Welsh woodlands also provide a suite of important services to local communities that contribute to the Well-being Goals for Wales[8] - including recreational opportunities that directly benefit population health and well-being, timber extraction contributing to our national economic development, and a wide range of local educational opportunities[9].

The bedrock of Wales is extremely varied, and the geodiversity of Wales has led to landscapes and environmental settings in Wales with strong cultural and heritage service value. Soils provide essential functions in food production, carbon storage, water cycle, biodiversity and a range of ecosystem services. In Wales, there is a scarcity of high quality agricultural soils (7% land area) and peat soils only comprise 4.3% of land area in Wales.

Soils in Wales have been contaminated from a range of human activities including industrial processes, and mobilisation of contaminants from these sinks can present widespread environmental hazards. Also, unsustainable soil management practices in some areas have resulted in soil erosion, reduced biodiversity, decreased carbon storage, reduced water retention, nutrient and gas cycle disruptions and reduced contaminant degradation. Climate change is expected to exacerbate these issues.

Issues relevant to the Strategy

- Improvements in land and soil management practices, have the potential to deliver multiple benefits, including benefits for flood risk management such as improved water retention and less compaction of soils to aid infiltration.
- Nature-based solutions and in particular natural flood management techniques have wider benefits than flood risk management as the reduction or slowing of run off can reduce soil erosion, diffuse pollution and greenhouse gas emissions, as well as enhancing biodiversity and landscape. Consideration of soil and land management is therefore an important element in delivering FCERM solutions with wider benefits.
- Measures should be taken through the Strategy to protect and enhance high quality agricultural soils and recognise them as a finite resource.
- Soils in Wales have been contaminated or degraded from past and present human activity. Industrial processes or activities have resulted in contaminated land that can sometimes pose an environmental hazard.

Likely evolution without the Strategy

- Climate change is likely to exacerbate many of the physical pressures that soils face already, for example, hotter, drier conditions make soils more susceptible to wind erosion, coupled with intense rainfall incidents that can

[7] Woodlands for Wales Strategy, 2018: https://beta.gov.wales/sites/default/files/publications/2018-06/woodlands-for-wales-strategy_0.pdf
[8] Welsh Government Well-being Statement 2017 https://beta.gov.wales/sites/default/files/publications/2017-10/prosperity-for-all-the-national-strategy-well-being-statement-2017.pdf
[9] Woodlands for Wales- Strategies: wide-reaching benefits: https://beta.gov.wales/forestry

wash soil away. Since climate change is also likely to affect soil processes, changes in key soil attributes such as organic matter content, water holding capacity, fertility and pH, are expected. Such changes directly affect the soil stability, further increasing the risks of wind and water erosion.

4. Water Resources & Quality

Water is abstracted from water bodies in Wales for a range of purposes including public water supply, agriculture, industry and generation of electricity. Most of this water is abstracted from surface rather than groundwater, with electricity generation abstracting the most (82%) followed by public water (13%).

Under the WFD standards, in Wales (2015) 39% and 55% of all surface water bodies and groundwater respectively were classified as good or better ecological status. The 2015 classification shows an increase of 7% in water bodies achieving good or better status due to improvements in monitoring, data collection and assessment.

The main reasons for water body failure in Wales are due to pollution from abandoned mines and contaminated land, agricultural pollution, barriers to fish migration and impoundments, but other factors also contribute to lowering water quality including: sewage discharges, acidification, forestry, flood protection and land drainage, surface water drainage from urban and transport development, abstraction and industrial discharges.

Issues relevant to the Strategy

- The WFD requires the prevention of the deterioration of all water bodies, and sets aims to improve their status (chemical, biological and physical). This provides significant potential constraints for FCERM, which need to be considered in the development of the strategy.
- The Strategy provides significant opportunities for flood and coastal erosion risk management to help in delivering the aims and objectives of the WFD, particularly in relation to physical (hydromorphological) improvements and Natural Flood Management techniques, where nature-based solutions such as woodland creation can have wider benefits such as improving water quality.

Likely evolution without the Strategy

- Climate change projections show increases in storm intensity with associated extreme rainfall events, coupled with predicted sea level rises. This scenario would lead to an increasing risk of future flood events, with associated potential increase in pollution risk from contaminated land, agriculture, sewerage, and abandoned mines – the primary sources of water pollution in Wales.

5. Climatic Factors

The World's climate is changing due to increased atmospheric greenhouse gas emissions, caused by burning fossil fuels, deforestation and land use change.

Statistics[10] for Wales showed a 0.9% increase in average temperatures from the period between 1961-90, when compared to 2005-14. Average rainfall over Wales has not changed significantly since 1910 but rises in sea levels around Wales have been estimated at 1.4 mm +/- 0.2 mm increase per year since 1901.

Based upon medium levels of greenhouse gas emissions, predictions show increases in mean summer temperatures of 0.9-4.5ºC by 2050. Rainfall averages are expected to remain stable, however significant changes to rainfall patterns are expected with more frequent and intense winter rainfall events - with 19% increases in winter rainfall predicted by 2080.

Future sea level rise around the Welsh coast is expected to result in significant coastal erosion and inundation events in low-lying coastal areas. Expected sea-level rises are currently predicted to be 36 cm by 2080[9]. The most significant threats of climate change to Wales[11] include: flooding (coast and inland) affecting people, property and infrastructure, and changes in coastal evolution including erosion and coastal squeeze.

Welsh Government has recently consulted on 32 proposed carbon reduction actions that will inform the first Low Carbon Delivery Plan that will be published in spring 2019. Welsh Government also consulted on a draft Climate Change Adaptation Plan in December 2018, which sets out the key climate risks for Wales and actions to build resilience to those impacts across sectors. The two Plans will replace the Mitigation and Adaptation Delivery Plans that were developed along with the Climate Change Strategy for Wales published in 2010 (referenced in the document). The SEA can only consider published documents and regulations but given the obvious and important links to FRM it is important to mention them here.

In addition to these climate change specific policies, decarbonisation has been added recently as a sixth priority area in the Prosperity for All Strategy.

Environmental Issues relevant to the Strategy

- Due to the increased pressures that climate change will place on existing flood and coastal erosion management regimes, such as expected increases in rainfall and river flows, sea level rises and increases in storm intensity, flood risk management regimes, people and ecosystems will need to be flexible and adaptable to future environmental pressures.
- Opportunity to contribute to the Welsh Government's climate change objectives and targets.
- Potential negative effects through the delivery and implementation of Strategy can be mitigated through implementation of innovative sustainable solutions and materials and use of renewable energy (eg in pumping stations).

[10] The UK Climate Change Risk Assessment Summary for Wales (2017): https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Wales-National-Summary.pdf
[11] The UK Climate Change Risk Assessment Summary for Wales (2017): https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Wales-National-Summary.pdf

- Protect and enhance the existing natural resources of Wales such as peatlands, wetlands, soils and forests, that absorb and store carbon, in addition to the new habitat creation, to contribute to climate change mitigation.
- An integrated sustainable approach to flood risk management with consideration to wider catchment consequences and benefits, such as upstream flood storage or natural flood management measures to deliver carbon sequestration whilst also managing flood and coastal erosion.

Likely evolution without the Strategy

- The frequency and intensity of rainfall events is predicted to increase with climate change, leading to increased river flows and risk of surface water flooding.
- Statistics show historic increases in the frequency of heavy rainfall events in UK and projected increases for the future. For example, in the past few decades there has been a general increase in annual average rainfall across the UK with the most recent decade (2008-2017) being 8% wetter than 1961-1990.
- Around 23% of the Welsh coastline is actively eroding, a natural process that can be exacerbated by heavy or prolonged rainfall and coastal storms. Erosion can have significant impacts on infrastructure assets, especially homes, businesses and transport networks located in exposed coastal areas and next to the coastline and results in habitat loss affecting biodiversity and ecosystem resilience.
- Sea level rise between 50cm and 1 metre is expected by the end of the century, increasing the likelihood of a severe 1-in-100-year coastal flood in west Wales to between a 1-in-10 and 1-in-20 annual chance. Modelling predictions suggests the number of assets exposed to a high risk of flooding from the sea is projected to increase significantly with climate change.

6. Material Assets

There are 245 118 properties at risk of flooding (fluvial, pluvial and tidal) in Wales[12]. Surface water hazard and risk maps produced by the Lead Local Flood Authorities in December 2013 showed approximately 163,000 properties were at risk of flooding due to surface water. This data is under review and will be updated once the Flood Risk Analysis Wales project is published.

A network of flood risk management assets across Wales, owned and maintained by NRW, local authorities and privately, protect property and infrastructure. Projected population increases by 4.6% between 2016-2041 and 30% predicted rises in single person households over the next 20 years, both result in projected increases in the household number and housing demand[13].

[12] Flood Risk Assessment Wales
[13] https://gweddill.gov.wales/statistics-and-research/national-population-projections/?lang=en

Serious indirect impacts from flooding include damage to energy, water, and communications infrastructure, in addition to disrupting public services such as schools and hospitals. A sizeable part of our important infrastructure and public services are in flood risk areas. Over 80% of water and sewage pumping stations or treatment works are in flood risk areas, with 67% at significant risk. In addition, nearly 800 police, fire and ambulance stations are within flood zones.

Issues relevant to the Strategy

- Only 6.7% of land in Wales is at risk of flooding from even a rare extreme flood event of up to a 1 in 1000 (0.1%) chance in any year. This emphasises the importance of controlling flood risk by keeping inappropriate development away from the floodplain, and coastal areas identified as being at risk from coastal erosion and/or flooding.
- Future approaches to flood and coastal erosion risk management must consider the potential impact on material assets, be that infrastructure related to residential, commercial or utilities.
- Increasing flood and coastal risk, as a result of climate change, could reduce the availability of land for development, placing additional pressure on the achievement of home building targets. There may be opportunities to develop good environmental and sustainable infrastructure that can deliver wider benefits (e.g. increased recreational opportunities, habitat improvements), in addition to protecting people, property and material assets from flooding/coastal erosion.
- In light of projected climate change, sea-level rise and increases in extreme weather events, Wales faces significant flood and erosion risk challenges for assets located along our coastline. Potential risks to these assets are especially high without intervention and implementation of the Shoreline Management Plan policies of managed realignment. Shoreline Management Plans set the policy for the most sustainable approach to coastal management over the next 100 years with respect to climate change, and in particular to projected sea-level rises.

Likely evolution without The Strategy

- Projected climate change, sea-level rises and increases in extreme weather events[14], means that Wales faces significant future flood and erosion risk challenges to material assets located along our coastline. Potential risks to these assets are especially high without intervention and implementation of sustainable management policies.
- Potential increased competition on land use between sectors

7. Cultural Heritage

[14] UKCP09 outputs: https://www.metoffice.gov.uk/research/collaboration/ukcp
State of the UK climate 2017 (published July 2018): https://www.metoffice.gov.uk/climate/uk/about/state-of-climate https://rmets.onlinelibrary.wiley.com/doi/10.1002/joc.5798

The unique and irreplaceable historic environment of Wales is an important economic and social asset and contributes greatly to the Welsh sense of identity and culture. There are three World Heritage Sites with a fourth under consideration, scheduled monuments, conservation areas and registered historic parks and gardens. The seas around Wales also contain a wealth of archaeological sites and remains, including eight designated historic wrecks.

Wales' cultural heritage assets are vulnerable from development, land management and the effects of climate change. However, current figures indicate that overall, 60 per cent of scheduled monuments inspected are in a stable / improved condition and 15 per cent show deterioration such for them to be categorised as being at risk. The percentage of listed buildings in a stable or improved condition is 75 per cent.[15]

Issues relevant to The Strategy

- Heritage assets, many of which lie adjacent to water bodies or lie within flood or coastal zones, present potential constraints to flood and coastal erosion risk management. They may also be at risk from erosion or flooding, or changes in the water table may affect the preservation of archaeological remains in soils. Heritage assets are a fragile resource requiring stringent protection as lost heritage features cannot be recreated.
- Policies / strategies / projects to re-connect floodplains or undertake managed realignment have the potential to conflict with heritage protection and conservation, although benefits are also possible.

Likely evolution without the Strategy

- The influence of climate change may exacerbate problems and risks to heritage assets and features. Rising sea levels and possible increase in storminess may endanger historic landscapes, structures and archaeology in the coastal zone. More frequent intense rainfall, leading to increased extremes of wetting and drying can cause increased erosion of archaeological sites.

8. Landscape & Seascape

Landscape defines natural, urban and peri-urban and includes land, inland water and marine areas, and seascape as landscapes with views of the coast or seas and the adjacent marine environment with cultural, historical and archaeological links to each other.

Wales is characterised by a beautiful and rugged landscape, ranging from the mountains and lakes of Snowdonia, to estuaries of the mid-Wales coast, to beaches and cliffs of Pembrokeshire and the industrial heritage of South Wales Valleys. The National Landscapes of Wales comprises of three National Parks,

[15] Wellbeing of Future Generations National Indicator 40, 2017-18 : https://www.wcva.org.uk/about-us/news/2018/10/welsh-government-—well-being-of-wales-2017-18-report?seq.lang=en-GB

five Areas of Outstanding Natural Beauty, 495 km of Heritage Coast and 58 landscapes of outstanding/special historic interest[16].
Issues relevant to the Strategy
• Environmental pressures especially related to climate change, coastal erosion, housing/business development and land management are likely to significantly impact our landscape. • FCERM policies may have a negative effect upon landscape features through changing the ways our flood and coastal zones look and function. • Implementation of NFM has potential to revert floodplains back to their natural states, enabling fluvial and coastal processes to once again naturally shape our aquatic ecosystems. • New natural habitats can be created and opportunities for new strategic habitat development may exist to strengthen local ecosystem resilience against climate change.
Likely evolution without The Strategy
• The environmental consequences of climate change and responses to predicted threats will impact our landscape and seascape.

4. Significant Effects of the Strategy

4.1 Actions proposed within the Strategy

The Strategy proposes five objectives to achieve the core aim to "**Reduce the risk to people, homes and businesses from flooding and coastal erosion through the sustainable management of our environment**". In Section 2 of this report we introduced the sub-objectives and screened out those that could have no pathways for significant environmental effects. The assessment of significant effects on the environment will be focussed on the objectives and sub-objectives as outlined below in Table 5.

Table 5 Five action-orientated Strategy objectives and associated sub-objectives

A.	**Improving our understanding and communicating flood risk**
1.	The Strategy makes a commitment to utilise the Flood Risk Assessment Wales and Communities at Risk Register to develop the second cycle of Flood Risk Management Plans (FRMP). The Strategy recognises Shoreline Management Plans (SMP) as live documents that should be reviewed and

[16] The National Association of Outstanding Natural Beauty. Areas of Outstanding Natural Beauty – Landscapes for Life: http://www.landscapesforlife.org.uk

amended where more current or detailed evidence is available. Measure to develop a process for challenging SMP policies.

B. Preparedness and building resilience

Scoped out of assessment

C. Prioritising investment to the most at risk communities

1. The Strategy promotes interventions to reduce flood risk, prioritising investment according to risk using the Communities at Risk Register (prioritising homes over business) and evidence of flood events, alongside supporting information on properties and wider benefits.
2. Interventions should utilise the option appraisal continuum (no intervention, NFM through to grey (hard) engineering). Hybrid options may be necessary, but the Strategy encourages more interventions that work with natural processes. New appraisal guidance requires at least one NFM option to be included in each business case.
3. The Strategy acknowledges the importance of hard engineering in flood alleviation but encourages green/grey interventions to improve the function, biodiversity and aesthetics of assets.

D. Preventing more people becoming exposed to risk

1. Managing development flood risk - The Welsh Government's policy of directing development away from areas at high risk of flooding and managing water is set out in Planning Policy Wales and Technical Advice Note (TAN) 15 which is being updated alongside this Strategy.
2. SuDS are a requirement on all new developments from January 2019.
3. Coastal adaptation – SMPs are a material consideration in planning and in Local Development Plans.
4. RMA's must consider how they can adapt management of the coast in light of climate change predictions and raise awareness and work with communities affected, particularly where SMP policies change from hold the line to managed realignment or no active intervention.
5. NHCP continues to monitor and predict coastal squeeze impacts on intertidal habitats and European sites. It also aims to deliver projects to proactively deliver compensatory habitat to allow RMA's to manage flood risk in coastal communities.
6. Asset maintenance – programme for regular maintenance of assets.

E. Providing an effective and sustained response to flood and coastal erosion events

Scope out of assessment

The assessment has been undertaken at a high national level, but in a way that can easily be applied to lower level plans, strategies or even project level EIA. It is for this reason that the assessment focussed on each specific Strategy objective, taking into account scoped in sub-objectives, to allow RMA's to easily avoid or reduce adverse effects and maximise beneficial effects when delivering under the objectives. This is detailed in Appendix 3.

4.2 Assessment of significant environmental effects of the Strategy

This Section draws together a summary of the assessment (Appendix 3) under each environmental receptor to determine the overall significance of effects of the Strategy.

Assessment of significant environmental effects of the draft Strategy are presented in a comprehensive series of completed assessment matrices in Appendix 3: Tables A1 to A3, one table for each of the scoped in Strategy Objectives (A,C,D) and organised by environmental receptor. In the final column of the tables, opportunities to mitigate any adverse effects, and potential enhancement opportunities that can contribute to maximising positive effects are described.

A judgement is made for each action on whether it is likely to lead to significant environmental effects, adverse or beneficial, and allocates within the table the level of significance, with associated colour-coded classification, as follows:

+	Significant beneficial effect
0	No significant/ neutral effect
-	Significant adverse effect

Assessment of Significant Environmental Effects

1.Population and Health

	Five Strategy Objectives				
Receptor Objective	A	B	C	D	E
To support attractive, resilient and viable communities, maximising peoples physical and mental well-being.	+	N/A	+	+	N/A

The purpose of the Strategy is the management and reduction of flood risk and coastal erosion for communities, businesses and infrastructure across Wales and in so doing, reduce the impacts and consequences and aid rapid recovery. Across all objectives this demonstrated significant beneficial effects on population and health.

The objectives promote improved prioritisation of flood risk management to the most vulnerable communities. This is considered to have significant beneficial effects on reducing inequalities and social deprivation within communities at risk. Areas of

deprivation and social inequality in England and Wales are sectors of communities most vulnerable to flood risk and least able to cope with the consequences[17].

Informed communities that understand and are prepared for flood events and are effectively supported by efficient emergency response will develop resilience and be better equipped to respond to events, reduce stress and anxiety and improve well-being.

The promotion of nature-based solutions has potential beneficial effects by reducing the need for hard engineering in urban locations and benefitting recreation and access to green recreational areas and waterside environments.

Planning policies that manage and restrict developments in high risk areas such as floodplains, will prevent communities being at risk when considering future trends of climate change.

Mitigation and Opportunities

- Opportunities to maximise multiple benefits associated with flood risk objectives by RMA's working collaboratively with each other and with Public Service Boards.
- Opportunities to enhance public health and well-being through design and maintenance of assets that improve access along green corridors and around the coast, to encourage recreational opportunities, thereby contributing to improving health and well-being.

2. Biodiversity, Flora and Fauna

	Five Strategy Objectives				
Receptor Objective	A	B	C	D	E
To maintain and enhance a biodiverse natural environment with health, functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change.	-	N/A	0	0	N/A

Objective A, which includes measures to develop a process to challenge SMP2 policies has the potential for significant adverse effects. It is thought unlikely that the challenge process would be applied to change hold the line policies to managed realignment or no active intervention. Given that RMA's focus is managing risk to the most at risk communities, the assessment has therefore been based on changing managed realignment or no active intervention policies to hold the line, with consequences for intertidal habitat. Much of the coastal area of Wales is internationally designated, yet the conflict arises where coastal communities are at risk of flooding and erosion. The accompanying draft Habitats Regulations Assessment documents more specifically the potential environmental effects on European Sites. This concludes that despite the implementation of mitigation, it is not possible to be certain that there will not remain the possibility of adverse effects upon the integrity of one or more sites of European importance, either alone, or in combination with other plans or projects arising from the

[17] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291071/se2-067-1-tr-e-e.pdf

implementation of the Strategy. Whilst this is considered to be a significant adverse effect, the justification under Article 6(4) is made and compensatory mechanisms, the National Habitat Creation Programme (NHCP) are in place.

The Strategy's strengthening and focus on the use of NFM in interventions is beneficial. It actively promotes nature-based solutions in line with the NRP, for example requiring NFM options to be short listed in all business cases for interventions. However, the strategy recognises that hard engineering is always going to be necessary where there are communities at risk. The creation of hard engineered structures in riverine or coastal environments can result in reduction or fragmentation of habitat, or reduction in the quality of valuable habitat. The promotion of the option appraisal continuum which encourages RMA's to use nature-based solutions, or hybrid options, will help to minimise the need for hard engineering options. Whilst the promotion of NFM will be beneficial to biodiversity, flora and fauna, there is still the acknowledgement that hard engineering will continue to be necessary and so, given the uncertainty at a national scale, overall effects for objective B were considered neutral.

FCERM can make a significant contribution to the protection and maintenance of sites valued for nature conservation that would otherwise be at risk from flooding or coastal erosion. For example, coastal defences may protect freshwater sites from saline inundation, pumping and storage can be optimised to contribute to nature conservation objectives.

Development restrictions in areas at risk of flooding and coastal erosion will likely have beneficial effects on the conservation of these natural habitats, enabling enrichment of natural biodiversity. The requirement to incorporate SUDS into all new development will also have beneficial effects in reducing rate of run-off and improving water quality and in themselves providing green infrastructure in urban environments.

Mitigation and Opportunities

- The process for challenging SMP2 policies must consider and demonstrate the technical, economic and environmental implications of change and apply the principles of Sustainable Development and SMNR in doing so. The environmental consideration will need to include a Habitats Regulations Assessment, with support and contribution to the NHCP where the statement of case has been established and compensatory habitat is deemed to be required.
- Early consultation with relevant conservation bodies in relation to projects and when challenging SMP2 policies.
- PPSs must consider the sensitivity of habitats and species present at an early stage of their development and seek to avoid adverse effects.
- The Environmental Assessment of all projects should seek to embed SMNR and SD principles and by doing so minimise adverse effects and maximise delivery of opportunities, including the Section 6 - Biodiversity and resilience of ecosystems duty.

- Opportunity when implementing objectives to protect communities to use nature-based solutions such as green engineering and seek to work with natural processes and in so doing maximise delivery of biodiversity enhancement under Section 6 - Biodiversity and resilience of ecosystems duty.
- The Strategy supports and promotes the NRP priorities to RMA's
- Opportunity to contribute to improving the ecological status of waterbodies by identifying synergies with FRM interventions and WFD measures.
- Opportunity to deliver actions under the Prioritised Improvement Plans and Thematic Action Plans of European Sites through FRM interventions.
- Opportunity for RMA's to engage with the Area Statement process to identify collaborative opportunities e.g. influencing land managers in priority catchments to employ measures that decrease run off.
- Opportunity to maintain the existing network of flood defences in a manner that maximises biodiversity e.g. seeding and mowing regimes that maximise benefit for pollinators and manage spread of INNS.
- Opportunity to enhance biodiversity through an FCERM intervention, for example green-grey interventions along a coastline or reconnecting a river to its floodplain.

3. Land Use, Geology, Soil & Contaminated Land

	Five Strategy Objectives				
Receptor Objective	A	B	C	D	E
To maintain and enhance soil and geology as an important resource and support.	0	N/A	0	0	N/A

No significant effects on soil or contaminated land arising for the Strategy are anticipated. Interventions can play an important role in determining whether soils, and the contaminants within them, are mobilised and discharged into water bodies. Traditional engineered solutions, such as walls close to river banks or on the coast may restrict or cut-off the pathway between contaminated ground and waterbodies.

The promotion of nature-based solutions such as NFM will help reduce potential erosion of soils, release of contaminants, and therefore also contribute to reducing diffuse pollution. However, solutions that involve setting back defences, or reduced flood risk management are likely to result in increased frequency in inundation in agricultural areas, potentially meaning reduced protection of soils / soil function in some areas.

Avoiding inappropriate development in the flood plain could also help to protect soil function. For example, contributing to buffer areas along river corridors, and not increasing impervious areas adjacent to waterbodies. Improved drainage and the use of SuDS may also play a similar role in an urban context by reducing diffuse pollution resulting from un-constrained urban runoff.

Coastal geodiversity and coastal processes could be adversely affected by continuing to hold the line of coastal defence. However coastal adaptation and changing of SMP policies also has the potential for adverse or beneficial effects.

Mitigation and Opportunities

- When considering the change of SMP policies, modelling of coastal processes should be undertaken to consider the effects and to inform the business case for change.
- Lower tier strategies and projects should seek to protect and enhance high quality agricultural soils and recognise them as a finite resource.
- Opportunity, through engagement with the Area Statement process, and influencing of the evolving "Brexit and Our Land" work to identify opportunities for RMA's to collaborate with and influence land managers to move towards sustainable land and soil management practices to deliver FRM benefits.
- Implementing NFM would have indirect beneficial effects on soil erosion and diffuse pollution.

4. Water Resources & Quality

	Five Strategy Objectives				
Receptor Objective	A	B	C	D	E
To maximise the sustainable management of water resources and help achieve the objectives of the WFD.	0	N/A	0	+	N/A

The extent to which interventions proposed as part of the Strategy can contribute to improving the water environment is dependent on the geographic area, the exact nature of the measure taken, and the sensitivity of the water bodies affected. Nature-based solutions, promoted by the Strategy, both on a coastal cell and river catchment basis, that are aligned with WFD objectives are likely to make a more significant contribution. Benefits to the hydromorphological functioning of the water body, the ecological status and potentially water quality can all result.

Interventions could have benefits for the water environment in terms of water quality. For example, assets can cut-off contaminant pathways, prevent saline intrusion of groundwater bodies on the coast and nature-based solutions such as NFM and SuDS will reduce diffuse pollution from rural and urban environments.

However, interventions also have the potential to alter the natural hydromorphological functions of waterbodies. This is evidenced by physical modifications resulting from flood risk management activities, amongst other things, being listed as one of the Significant Water Management Issues in the second cycle RBMP. For example, the supply and transport of sediment, both in river catchments and along the coast, can be affected by the introduction of hard structures and the introduction of barriers designed to control flow.

Restricting and avoiding inappropriate development in flood risk areas is likely to have significant beneficial effects to water quality and hydromorphological function.

Mitigation and Opportunities

- Mitigation and opportunities for wider benefits primarily focus on the benefits of establishing links with WFD objectives to maximise the benefits to the water environment. This should be established by the RMA's and partners, through reference to the relevant RBMP.
- Opportunity to contribute to improving the ecological status of waterbodies by identifying synergies with FRM interventions and WFD measures.
- Emphasis on nature-based solutions when implementing objectives will help to maintain / restore hydromorphological function of waterbodies.
- Innovative catchment and land management-based solutions may be identified and delivered through collaboration with land managers. RMA's should seek opportunities through engagement with the Area Statement process.

5. Climatic Factors

	Five Strategy Objectives				
Receptor Objective	A	B	C	D	E
To limit the causes and effects of climate change and ensure resilience and adaptation to any consequences of climate change.	0	N/A	0	+	N/A

The Strategy is anticipated to have significant beneficial effects from objectives to manage the consequences of climate change and help Wales adapt to new climate challenges related to increases in extreme rainfall events, storm surges/intensity, increased river flows and sea level rise. However, the potential for the Strategy to contribute to mitigation of climate change factors is considered to be limited, and also depends on the nature of solutions proposed.

There are potential adverse effects on climate change mitigation due to the carbon footprint associated with construction of traditional hard-engineered defences and through the operation and maintenance of certain structures e.g. pumping stations. Although this is unlikely to be significant at a national scale. The Strategy, promotes, in line with the NRP, that RMA's should seek to increase resource efficiency and renewable energy in the construction and maintenance of FRM assets.

The Strategy promotion of nature-based solutions, in line with the NRP, have potential for positive mitigation effects. For example, the creation of wetlands for storage, or woodland planting to reduce run-off, can have benefits from carbon sequestration. Adopting such solutions that work with natural processes may also help natural systems to adapt to the effects of climate change.

The Strategy promotes planned adaptation around the coast, in line with the emerging Climate Change Adaptation Delivery Plan for Wales. Prioritising the highest risk areas for protecting vulnerable communities from flooding and coastal erosion will result in significant positive effects on the country's ability to adapt to climate change. Through advanced planning, flood warning, improving resilience to flood inundation and managing its consequences, this will also have significant benefit in helping communities adapt to climate change and its effects.

Avoiding inappropriate siting of developments within the floodplain and implementing SuDS, will ensure that long term plans for development, and their supporting drainage infrastructure, will result in significant beneficial effects on managing and adapting to climate change pressures.

Mitigation and Opportunities

- Nature-based solutions and solutions that seek to minimise the use of non-renewable or high energy (e.g. concrete or steel) resources should be sought in the maintenance or construction of interventions.
- Renewable energy should be used in the operation of assets where possible.
- Consideration can be given to whether FCERM interventions can contribute to adapting to other effects of climate change e.g. by considering the effect on a river of low flows or contributing to reducing urban heat island effects.

6. Material Assets

	Five Strategy Objectives				
Receptor Objective	A	B	C	D	E
To promote sustainable management and resilience of existing material assets and infrastructure.	+	N/A	+	0	N/A

The effects of the Strategy on material assets are considered to be predominantly beneficial, with the management of risk to properties and businesses being part of the overarching objective of the Strategy.

The objectives to design a process for challenging SMP policies and promoting coastal adaptation to climate change pressures will be beneficial by seeking to reduce the risk to existing communities, businesses and infrastructure.

Prioritised investment is likely to result in significant beneficial effects for the protection of the most important existing material assets. Increasing the resilience of infrastructure may also aid in reducing adverse effect/ consequences of flooding, albeit to a lesser extent, since it may not avoid all inundation of assets. However, the Strategy recognises that investment needs to be rigorously prioritised based on homes at risk, which may leave other material assets at increasing risk if the beneficiaries are not enabled or empowered to mitigate their own risk.

Locating new developments and future assets away from flood plains and areas at risk of coastal erosion will help ensure that new material assets are not at risk, and the existing risk of flooding is not exacerbated by new development. Managing run-off of new developments through SuDS implementation will also help conserve material assets.

Mitigation and Opportunities

- Prioritisation of investment and working collaboratively with RMA's and partners to secure other sources of funding for FCERM will be essential to make the most effective use of finances available and ensuring protection for the areas at greatest risk of flooding and coastal erosion.
- Investment in the protection from flood and coastal erosion risk will need to take into account long term influences such as climate change, for example increased storminess / storm surges, increased river flows, and other influences such as development pressure and land use change.

7. Cultural Heritage

	Five Strategy Objectives				
Receptor Objective	A	B	C	D	E
To protect and sustainably manage the historic environment including cultural heritage resources, historic buildings and archaeological features.	+	N/A	0	0	N/A

Objectives to manage flood and coastal erosion risks can have significant benefits to the historic environment, by improving the level of protection, enhancing the longevity of features and reducing the cost of maintenance. Although cultural heritage assets may not necessarily be the principle focus of prioritised investment, there are likely to be secondary benefits where heritage assets / important features lie within those areas prioritised for protection. Conversely, areas of heritage interest away from prioritised areas may become more exposed to flood and coastal erosion risk.

The Strategy supports nature-based solutions, which can result in benefits of managing flood risk at a landscape scale, and also potentially benefit or complement important historic landscapes.

The construction and maintenance of FCERM assets has the potential to conflict with cultural heritage where new or existing assets are located in areas of high cultural / archaeological sensitivity. Heritage assets such as listed buildings, scheduled monuments, bridges, weirs, or important undiscovered archaeology can often be adjacent to rivers or on the coast and can be directly affected by FCERM interventions.

Overall the effect of the Strategy on cultural heritage is uncertain at this national scale. However, potential pathways for effects have been identified and mitigation should be implemented in lower tier strategies and projects.

Mitigation and Opportunities

- Early engagement of and partnership with the relevant heritage organisations in any proposals to deliver interventions and in the development of a process to challenge SMP2 policies.
- Coastal adaptation should include recommendations to record sites that are at risk of being lost, where a case cannot be made to protect and preserve.
- Nature-based solutions such as reconnecting floodplains or managed realignment, should attempt to reduce conflict with heritage protection and conservation.
- Projects and local strategies must consider at an early stage of their development, the sensitivity of historic assets including their settings and seek to avoid adverse effects.

8. Landscape & Seascape

Receptor Objective	Five Strategy Objectives A	B	C	D	E
To maintain and enhance Wales' landscape and seascape character.	0	N/A	0	0	N/A

Maintaining hold the line SMP policies and coastal adaptation are unlikely to have adverse effects on landscape and seascape in the short term, but longer term adverse effects could be brought about by the need to raise the height or improve the structural integrity of defences as sea levels rise. The significance of effects will depend upon the nature of SMP policy implementation and coastal adaptation.

The Strategy objectives promoting interventions have the potential to adversely affect landscape or seascape although it depends upon the nature of interventions, with hard engineering having the greatest potential for adverse effects. However, the Strategy also promotes the option appraisal continuum which will result in green engineering, NFM or hybrid options being considered where technically and economically viable. In urban areas, if sensitively designed, interventions can contribute to the continuity and character of a local townscape, thereby maintaining or even enhancing regional or local distinctiveness.

The avoidance of development in flood or coastal erosion risk areas will support the maintenance of natural landscape character. NHCP will also aim to restore natural coastal habitat, with potentially beneficial effects at a local level, although this will be dependent upon the nature, scale and location of projects.

Mitigation and Opportunities

- Promoting nature-based solutions that minimise damage to the environment and seek to deliver biodiversity benefits are all consistent with minimising adverse effects on the landscape and seascape.

- Where interventions are in urban environments, as is often the case, obtain early landscape architect input to the projects to ensure the options and design are sensitive to the landscape.

4.3 Cumulative effects of the Strategy with other policies, plans and programmes

This Section considers the cumulative and synergistic effects of the Strategy, considering its interaction with other policies, plans, programmes and legislation, and demonstrating performance under Welsh Government well-being objectives and Natural Resources Policy. The relationship of the Strategy to some of these is discussed in the assessment above (e.g. WFD and Habitats Directive) and therefore this section only identifies additional cumulative effects:

- The Strategy has been assessed as having a significant beneficial effect on the country's ability to adapt to **climate change**. This supports and will enhance wider policy initiatives to adapt to the impacts of climate change.
- The Strategy promotes and therefore complements the three priorities of the **Natural Resources Policy**. The need for RMA's to demonstrate consideration of nature-based solutions and resource efficiency in their strategies and projects and justify where hard engineering options are the only technically and economically viable option, sets the framework for delivery of the NRP for FRM in Wales. The strong focus on RMA's working collaboratively and with local communities also reflects the place-based approach. This could be further strengthened by encouraging RMA involvement in the development of Area Statements and contributing to the delivery of Local Well-Being Plans.
- Welsh Government well-being objectives are our commitment to delivering the well-being goals. The Table in Appendix 4 shows where the Strategy can contribute to these objectives.
- The FCERM Strategy for England is under development alongside this Strategy and so in its draft format it is not appropriate to consider cumulative and synergistic effects. WG and DEFRA and NRW and the Environment Agency work closely together to ensure flood and coastal issues that occur across the Wales-England border are managed appropriately.
- The **Flood Risk Management Plans** (FRMP) have been developed on a river basin basis, covering the Dee, the Severn and Western Wales. The Dee and Severn being cross-border plans. These were designed to promote more joined up management of the water environment, as they are the same study area as the **River Basin Management Plans** (RBMP). The Strategy requires, in line with the Floods Directive, the production of FRMPs and they will be developed on a 5-year cycle alongside RBMPs, in line with the framework set by this Strategy and seeking to complement the RBMPs. The first cycle of FRMPs underwent SEA and HRA, ensuring environmental effects were considered in their development and adoption.
- **Shoreline Management Plans** (SMP) were developed according to areas of coastline within a littoral sediment cell. The Strategy promotes the adoption of the policies in decision making, whether that be for lower level strategies and projects, or for planning decisions. Potential conflicts may arise in the development of a process to challenge SMP2 policies, however, this can be mitigated by ensuring that

environmental implications are considered alongside technical and economical justifications. This should include an appropriate level of environmental assessment and Habitats Regulations Assessment.

- The **Welsh National Marine Plan** is under development, with the draft having been published. The plan will provide policy guidance and spatial planning for the inshore and offshore marine areas. The inshore, coastal areas are considered relevant in relation to cumulative effects within the strategy. The aim of the WNMP is: "To support the sustainable development of the Welsh Marine area by contributing across Wales' well-being goals. Ensuring the SMNR by taking account of the cumulative effects of all uses of the marine environment". The Sustainability Appraisal undertaken for the WNMP tested the emerging policies to ensure they support the policies and actions of SMPs. The WNMP is composed of cross-cutting safeguarding policies and sector specific policies, the former includes a policy stating that "Proposals should demonstrate how they are resilient to coastal change and flooding over their lifetime". The implementation of the marine plan will promote a more considered approach to marine spatial planning, allowing cumulative effects to be determined for plans and projects affecting the coastal environment. The Strategy and WNMP are therefore complementary and will work towards the same goals for coastal management.
- In the summer of 2018, Welsh Government published the consultation document "**Brexit and our Land**". This is only at consultation and so cannot be considered in the strategic context review undertaken for this SEA. However, the document highlights the "opportunities for networks of land managers across Wales to slow down water flow by creating or restoring floodplain woodlands, restoring peat bogs, providing land for upstream winter overflow and improving riparian habitats throughout water catchments to collectively reduce the risk of flooding to downstream communities". There is still a great deal of uncertainty around Brexit, but it is also important to recognise the opportunity it could present in relation to FRM in delivering nature-based solutions.
- The Wales Spatial Plan is to be replaced by the National Development Framework (NDF) in 2020. The NDF is currently under development but it will set out where nationally important growth and infrastructure is needed and how the planning system can deliver it and provide direction for Strategic and Local Development Plans. The NDF will sit alongside Planning Policy Wales which has recently been updated and published (Dec 2018) and is supported by Technical Advice Notes (TAN), including TAN 15 on Development and Flood Risk. Planning Policy Wales and TAN15 deter inappropriate development on floodplains and on the coast and ensures flood and coastal erosion risk are considered at an early stage in the planning process.

4.4 Additional environmental mitigation and opportunities

This assessment has identified the significant effects on the wider environment likely to occur as a result of implementation of the Strategy. The assessment process also identified opportunities to enhance the beneficial effects and mitigate any adverse significant environmental effects of actions proposed in the Strategy.

A number of these opportunities are incorporated directly within the proposed actions within the Strategy. For example, the requirement for projects to include NFM in the short listing of options and the continuing support and promotion of the NHCP.

Additional safeguards exist to ensure that the environmental implications are addressed in related decision-making processes:

- The Strategy, provides a FCRM specific framework for RMA's to deliver their duties under the WFGA and the Environment (Wales) Act.
- Sustainability Appraisal will be undertaken during the development of Local Development Plans. These are required to comply with the SEA Regulations and should take into account the objectives of the Strategy and associated plans or strategies.
- The implementation of planning decisions in accordance with the provisions of Technical Advice Note 15 will help to ensure that inappropriate development is not constructed in flood risk areas. The Strategy supports the strengthening of policy advice on managing development of flood risk in the TAN15 review.
- Habitats Regulations Assessments are undertaken to determine whether a proposed, plan, strategy or project is likely to adversely affect the integrity of a European designated site.
- Water Framework Directive compliance assessments are undertaken to ensure compliance with WFD objectives.

4.5 Assessment of alternatives

The SEA Regulations require that an environmental report includes an evaluation of the likely significant effects of the Strategy and reasonable alternatives.

The Strategy is giving effect to the requirements of the Flood and Water Management Act 2010, and it provides a framework for more specific actions to be implemented by the Risk Management Authorities. Given the need to comply with the requirements of the Act, the stated objectives of the strategy, and the 'high level' framework provided by the Strategy, we consider that there are limited alternatives that would result in materially different environmental effects. The alternatives considered by Welsh Government were:

1. Do nothing – this is not considered as a reasonable alternative as the Flood and Water Management Act 2010 requires that the Strategy specifies how and when it will be reviewed.
2. Do minimum – a simple review and revision of the 2011 Strategy.
3. A new Strategy prepared in light of new legislation (Well-being of Future Generations Act, Planning Act and Environment Act) and improvements in FCERM information.

The "Do nothing" option is not considered a reasonable alternative, given the legislative requirements of the FWMA 2010. The assessment of alternatives will therefore consider, at a high level, the environmental effects of the 2011 objectives by applying the assessment criteria we have developed for this environmental assessment, to ensure it reflects the effects on the current environmental baseline. This assessment is presented in Appendix 4.

Given the high-level nature and the lack of spatial policy or objectives of the Strategy, the consideration of reasonable alternatives is difficult to assess with any certainty. Many elements of the two strategies are the same, as demonstrated by the objectives in Table 5.

Table 5: Comparison of 2011 Strategy Objectives with 2019 Strategy Objectives

2011 Strategy Objectives	2019 Objectives
	Improving our understanding and communication of risk
Raising awareness of and engaging people in the response to flood and coastal erosion risk. SCOPED OUT	Preparedness and building resilience SCOPED OUT
Prioritising investment in the most at risk communities.	Prioritising investment to the most at risk communities
Reducing the impacts on individuals, communities and businesses from flooding and coastal erosion.	Preventing more people becoming exposed to risk
Providing an effective and sustained response to flood and coastal erosion events.	Providing an effective and sustained response to events SCOPED OUT

The assessment of alternatives demonstrated that the 2011 strategy had comparable effects across all environmental receptors as the 2019 strategy. However, the 2019 strategy has greater potential for promotion of beneficial effects in three areas:

- Making evidence more accessible to promote transparent, evidence-based decisions.
- Accessible evidence will also better inform communities and influence behaviours.
- Promotion of collaborative working between RMA's and key stakeholders.
- Promotion of NFM.

New legislation has influenced the 2019 Strategy as it places various duties on Welsh Government and RMA's in relation to sustainable development, SMNR and biodiversity maintenance and enhancement and consideration of the resilience of ecosystems. For example, there is greater emphasis on nature-based solutions and green engineering as a result of the Environment Act and Natural Resources Policy. This has the potential for greater environmental benefits in terms of biodiversity, water quality and resource and climate adaptation, but there is a high degree of uncertainty given that hard engineering is also recognised as a necessary option for managing flood risk in those communities at highest risk.

5. Monitoring the effects of the Strategy

5.1 Outline of proposed monitoring for significant environmental effects

Once the draft Strategy is finalised and adopted, Article 10(1) of the Strategic Environmental Assessment Directive requires its significant environmental effects to be monitored. This section presents an outline of the actions we expect to undertake in relation to monitoring the significant environmental effects of the strategy.

The Flood and Water Management Act 2010, under Section 18, requires NRW to report to the Minister about FCERM in Wales, in particular it must include information about the application of this Strategy. To date, Natural Resources Wales has published two reports, covering the periods 2011 -2014 and 2014-16. The third report, will cover the period 2016 to 2018. These reports are produced from information provided by RMA's and reflect the work they do to manage the risks to people and property from all sources of flooding and erosion of the coastline. It summarises the significant investment, key developments and operational improvements made to reduce flood risk and coastal erosion in Wales and to improve awareness and preparedness of those at risk.

Whilst it is feasible to monitor the significant effects of the Strategy, it will not be possible to determine whether any changes in these factors can be attributed to the Strategy. There are too many other influences on environmental outcomes for a direct relationship to be identified. Nevertheless, it is reasonable to monitor environmental outcomes to determine whether changes to the Strategy are required to further reduce conflicts or make a greater contribution to achievement of environmental objectives.

The table below recommends specific monitoring linked to environmental receptors that is already undertaken and used in the development of policy and FCERM actions. We also recommend additional monitoring to help demonstrate how RMA's are contributing to the well-being goals and ecosystem resilience. The priority for Welsh Government is monitoring the reduction of risk to homes and businesses, but in doing so, opportunities should be sought to capture any additional benefits.

Important high-level reporting through well-being objectives of WG and RMA's and State of Natural Resources Report (SoNaRR), prepared by NRW, will provide high level monitoring of trends and evidence of well-being and natural resource management.

Table 6: Proposed monitoring of the effects of the National FCERM Strategy

Environmental Receptors	Proposed monitoring
Population and human health / Material Assets	NRW is required to report to the Welsh Government an annual update of the number of properties at different levels of flood risk on an annual basis. *Recommendation to collate information on the access and recreational improvements delivered through FCERM activities.*

Biodiversity, Flora and Fauna	The NHCP monitors gains and losses of coastal habitat brought about through coastal squeeze and to proactively deliver compensatory habitat to allow RMA's to continue to defend coastal communities at risk. The number of NFM and hybrid schemes undertaken will be reported to Welsh Government annually through grant reporting and reported to Welsh Ministers by NRW through Section 18 Reports. *Recommendation to collate information on enhancements delivered that contribute to the NRP priorities and the Section 6 - Biodiversity and ecosystem resilience duty*
Water	Monitoring is undertaken to determine progress towards meeting WFD objectives for water body status, including ecological status. This is reported every 5 years in the RBMPs. The FRMPs will also be developed on the same 5-year cycle so synergies and conflicts are identified and managed accordingly.
Climatic factors	As one of the purposes of FCERM is to enable adaptation to the effects of climate change, evidence such as the Flood Risk Assessment Wales maps, annual topographic surveys by the Wales Coastal Monitoring Centre and the National Asset Database will allow Welsh Government and RMA's to monitor adaptation to climate change. *Recommendation to utilise the Carbon Calculator through projects delivery to raise the profile of resource efficiency and contribute to climate change mitigation.*
Cultural Heritage	*Recommendation to collate information where FCERM activities have benefitted the historic environment.*

The proposals for monitoring the effects of the strategy will be developed further in the preparation of the final strategy and will be published in the Statement of Environmental Particulars, alongside the adopted Strategy.

5.2 Future strategic environmental assessment activities

This environmental report concludes the main stage of the strategic environmental assessment process for the Strategy. A Strategic Environmental Assessment 'Statement of Particulars' will be published alongside the adopted strategy, explaining how consultation responses and the findings of this environmental report have influenced the Strategy-making process and how monitoring requirements have been finalised. Table 6 sets out monitoring that can be used to be taken into consideration in future reviews of the Strategy.

Appendix 1: Plans, Policies and Programmes reviewed for the SEA

Category of Plan / Strategy	Common themes	Key influences of the plans / strategies and opportunities	Plans, Strategies, legislation of relevance
Water and flood risk management	Protection, improvement, sustainable management and use of the water environment (surface ground, estuarine and coastal waters), in terms of quantity and quality – for the benefit of the human and natural environment / wildlife.	• A series of legal and policy drivers relating to protection and enhancement of the water environment, which must be complied with in delivering flood and coastal erosion risk management. • FRM strategies, measures etc. arising from the national strategy can help deliver improvements to the water environment required by legislation.	**European Union (EU) Directives, Strategies & Policy Packages** • Bathing Waters Directive 2006/7/EC • Water Framework Directive (2000/60/EC) • Floods Directive 2007/60/EC • Directive 2006/118EC on the protection of groundwater against pollution and deterioration • Drinking Water Directive (98/83/EC) • Nitrates Directive (91/676/EEC) **National Primary / Secondary Legislation** • The Environment (Wales) Act 2016 • Well-being of Future Generations (Wales) Act 2015 • Flood and Water Management Act 2010 • Water Act 2003 • Water Industry Act 1991 • Water Resources Act 1991 • Land Drainage Act 1991 • Reservoirs Act 1975 • Salmon and Freshwater Fisheries Act 1975 • The Environmental Impact Assessment (Land Drainage Improvement Works) (Amendment) Regulations 2017 • The Bathing Waters Regulations 2013 • Groundwater (England and Wales) Regulations 2009 • The Protection of Water Against Agricultural Nitrate Pollution (England and Wales) Regulations 2006 (as amended)

			• The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 • Urban Wastewater Treatment Regulations (England and Wales) 1994 **National / Regional Plans and Programmes** • National Development Framework – Issues, Options and Preferred Option 2018 • The Welsh National Marine Plan – Initial Draft 2017 • People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016 • Welsh Government Natural Resources Policy 2017 • The State of Natural Resources Report 2016 • Welsh Government Water Strategy for Wales 2015 • National Strategy for Flood and Coastal Erosion Risk Management in Wales 2011 • Water for People and the Environment: Water Resources Strategy for Wales 2009 • TAN15: Development and Flood Risk 2004 • DCWW Draft Water Resources Management Plan 2018 • DCWW Water Resources Management Plan 2014 • DCWW Drought Plan 2015 • Flood Risk Management Plans (various) • River Basin Management Plans (various) • Catchment Abstraction Management Strategies (CAMS) (various)
Marine and Coastal	Sustainable development and integrated	• Controls over the nature of coastal protection works, and	**European Union (EU) Directives, Strategies & Policy Packages** • Birds Directive (2009/147/EC)

	management of coastal areas, balancing the mixed uses of the coastal environment such as nature conservation, fisheries, navigation, recreation and access, and coastal protection. Aims for reduction of the risk of new development to coastal change and restriction of inappropriate development.	drivers for sustainability, working with natural processes, and considering key environmental receptors in the coastal environment. PPs can help contribute to the aims of the national strategy by discouraging / preventing inappropriate development in coastal areas at risk of flooding / coastal erosion. • FRM strategies, measures etc. arising from the national strategy can help contribute to the sustainable development of the coastal environment, by considering sensitivities and nature-based solutions, recognising the wide area of	• Marine Strategy Framework Directive 2008/56/EC • Directive on the Conservation of Wild Birds (09/147/EC) • Bathing Waters Directive 2006/7/EC • Water Framework Directive (2000/60/EC) • Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) & Subsequent Amendments **National Primary / Secondary Legislation** • The Environment (Wales) Act 2016 • Well-being of Future Generations (Wales) Act 2015 • Marine and Coastal Access Act 2009 • The Bathing Waters Regulations 2013 • Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended 2010) **National / Regional Plans and Programmes** • National Development Framework – Issues, Options and Preferred Option 2018 • The Welsh National Marine Plan – Initial Draft 2017 • People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016 • Welsh Government Natural Resources Policy 2017 • The State of Natural Resources Report 2016 • Shoreline Management Plans (various) • National Strategy for Flood and Coastal Erosion Risk Management in Wales 2011 • TAN 14 - Coastal Planning 1998 • Partnership for Growth: The Welsh Government Strategy for Tourism 2013 – 2020

		influence of coastal processes.	• Wales Marine and Fisheries Strategic Action Plan 2013
Biodiversity and conservation	Protection and enhancement of important habitats and species, both from a statutory basis (International and National conservation designations and protected species) and through policy objectives, such as for healthy functioning ecosystems and for BAP habitat creation.	• When implementing strategies, measures etc. arising from the national strategy, due consideration must be given to relevant conservation legislation and biodiversity sensitivities, with protection and enhancement of biodiversity wherever possible. • Through integration with FCERM policies arising from the national strategy, delivering nature-based solutions wherever possible, policy objectives to restore, enhance and improve biodiversity can be delivered.	**International / European Plans and Programmes** • Rio Convention 1992 • Bern Convention 1979 • Bonn Convention 1975 • Ramsar Convention 1971 **European Union (EU) Directives, Strategies & Policy Packages** • Birds Directive (2009/147/EC) • The Eel Directive 2007/1100/EC • Directive on the Conservation of Wild Birds (09/147/EC) • Water Framework Directive (2000/60/EC) • Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) & Subsequent Amendments • EU Biodiversity Strategy to 2020 – towards implementation 2011 **National Primary / Secondary Legislation** • The Environment (Wales) Act 2016 • Well-being of Future Generations (Wales) Act 2015 • Marine and Coastal Access Act 2009 • Natural Environment and Rural Communities Act 2006 • Wildlife and Countryside Act 1981 (as amended) • Countryside and Rights of Way Act 2000 • Salmon and Freshwater Fisheries Act 1975 • UK Biodiversity Action Plan 1994 • The Eels (England and Wales) Regulations 2009 • Conservation of Habitats and Species Regulations 2017

			• Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended 2010) **National / Regional / Local Plans and Programmes** • Vital Nature: Making the connection between biodiversity and the people and places of Wales – NRW strategic steer for Biodiversity to 2022 • National Development Framework – Issues, Options and Preferred Option 2018 • The Welsh National Marine Plan – Initial Draft 2017 • People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016 • Welsh Government Natural Resources Policy 2017 • The State of Natural Resources Report 2016 • TAN 5: Nature Conservation and Planning 2009 • Defra (Various) Eel Management Plans • Natural Resources Wales (various) Salmon Action Plans • Local Biodiversity Action Plans (LBAPs), including Species and Habitats Action Plans (various)
Soils Contaminated Land Geology	Long term protection, sustainable management and improvement of soils. Contaminated land issues and links to pollution of the water environment.	• Will encourage the national strategy to consider the impact of its strategies, plans etc. on soils and agricultural land. • Without due consideration, FCERM strategies, measures etc. arising	**European Union (EU) Directives, Strategies & Policy Packages** • European Commission (EC) (2006) Thematic Strategy for Soil Protection EU Directives on Environmental Impact Assessment (Codified Directive 2011/92/EU and Revised Directive 2014/52/EU) • Drinking Water Directive (98/83/EC) • Nitrates Directive (91/676/EEC) • Directive on the Landfill of Waste (99/31/EC) • Environmental Liability Directive 2004

	Consideration of soil management and agricultural practices as a new potential FCERM mitigation measure.	from the national strategy has the potential to exacerbate pollution of water environment through mobilisation of contamination. • National strategy potentially at odds with policy aims to reduce risk of flooding to sensitive agricultural areas.	• Mining Waste Directive 2006/21/EC **National Primary / Secondary Legislation** • Part II of the Environmental Protection Act 1990 • Contaminated Land (Wales) Regulations 2006 (as amended in 2012) • Environment Act 1995 • Environmental Permitting Regulations 2010 (as amended) • Environmental Damage (Prevention and Remediation) (Wales) Regulations 2009 • Wildlife and Countryside Act 1981 (as amended) **National / Regional / Local Plans and Programmes** • National Development Framework – Issues, Options and Preferred Option 2018 • People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016 • Welsh Government Natural Resources Policy 2017 • The State of Natural Resources Report 2016 • Food for Wales, Food from Wales 2010-2020 Food Strategy for Wales 2010 • TAN5: Nature Conservation and Planning 2009 • UK Geodiversity Action Plan 2011 • Local Planning Authority Local Plans (various) • AONB Management Plans • National Park Management Plans (various) • Local Geodiversity Action Plans (LGAPs)
Climate / Climatic	Long term aims for reduction of	• Sets policies and targets for energy	**International / European Plans and Programmes** • Kyoto Protocol 1997

factors / Air quality	carbon dioxide emissions including binding targets, and wide-reaching policies across all sectors to deliver these reductions. Requirements to adapt to climate change and associated threats, the need for increased resilience to climate change.	efficiency, renewable energy, carbon emissions reduction, which the national strategy should seek to contribute to. FCERM policy must allow for and accommodate climate change predictions - for sea level rise, increased river flows. • Through integration of policy aims, FCERM strategies, measures etc. arising from the national strategy can help deliver objectives in relation to climate change, both through adaptation, and consideration of mitigation.	• Paris Agreement; Europe 2020 • A Roadmap for Moving to a Competitive Low Carbon Economy in 2050 **European Union (EU) Directives, Strategies & Policy Packages** • A Roadmap for Moving to a Competitive Low Carbon Economy in 2050 • Strategy on Adaptation to Climate Change 2013 • A Policy Framework for Climate and Energy in the Period from 2020 to 2030 • National Emissions Ceiling Directive 2001/81/EC • Renewable Energy Directive (2009/28/EC) • Energy 2020 - A Strategy for Competitive, Sustainable and Secure Energy • Industrial Emissions Directive (2010/75/EU) • Ambient Air Quality and Cleaner Air for Europe **National Primary / Secondary Legislation** • Climate Change Act 2008 • The Environment (Wales) Act 2016 • Well-being of Future Generations (Wales) Act 2015 • The Air Quality Standards (Wales) Regulations 2010 **National / Regional / Local Plans and Programmes** • National Development Framework – Issues, Options and Preferred Option 2018 • People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016

			• Welsh Government Natural Resources Policy 2017 • The State of Natural Resources Report 2016 • Environment Strategy for Wales 2006 • The Climate Change Strategy for Wales 2010 • National Strategy for Flood and Coastal Erosion Risk Management in Wales 2011 • DCWW Water Resources Management Plans (various) • DCWW Water Resources Management Plan 2014 • River Basin Management Plans (various) • Shoreline Management Plans (various) • Flood Risk Management Plans (various) • Local Planning Authority Local Plans (various) • Air Quality Management Plans (various) • Air Pollution in Wales 2015 • The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007
Economy and sustainable development	Sustainable economic development, for the benefit of the economy, communities and the wider environment.	FCERM Strategies, measures etc. arising from the national strategy need to consider consideration of Sustainable Development principles, such as local sourcing of materials, use of local workforce.	**International / European Plans and Programmes** • The World Summit on Sustainable Development (WSSD), Johannesburg, September 2002 - Commitments arising from Johannesburg Summit (2002) **European Union (EU) Directives, Strategies & Policy Packages** • Renewable Energy Directive (2009/28/EC) • Renewed EU Sustainable Development Strategy 2006 **National Primary / Secondary Legislation** • Well-being of Future Generations (Wales) Act 2015 **National / Regional / Local Plans and Programmes**

			• National Development Framework – Issues, Options and Preferred Option 2018 • The Welsh National Marine Plan – Initial Draft 2017 • People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016 • Welsh Government Natural Resources Policy 2017 • Tackling Poverty Action Plan 2013 • Prosperity for All 2017 • Woodlands for Wales 2018 • One Wales: One Planet: The Sustainable Development Scheme of the Welsh Assembly Government 2009 • TAN 6 – Planning for Sustainable Rural Communities 2010 • TAN 4: Retailing and Town Centres 2016 • TAN 8: Renewable Energy 2005 • TAN 13: Tourism 1997 • TAN 23: Economic Development 2014
Planning, transport and infrastructure (material assets)	Improvement and sustainable development of public services, and management of transport networks.	• FCERM Strategies, measures etc. arising from the national strategy need to take into account consideration of critical transport networks, encouraging the close working with transport operators / organisations.	**European Union (EU) Directives, Strategies & Policy Packages** • Waste Framework Directive (2008/98/EC) **National Primary / Secondary Legislation** • Planning (Wales) Act 2015 • Well-being of Future Generations Act (Wales) 2015 • Town and Country Planning Act 1990 / EIA Regulations • Active Travel (Wales) Act 2013 **National / Regional / Local Plans and Programmes** • Prosperity for All 2017

		• The national strategy should consider and influence the sustainable development of plans / strategies for transport networks, so that they do not contribute to flood and coastal erosion risk issues, and where possible help to improve them.	• National Development Framework – Issues, Options and Preferred Option 2018 • People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016 • Welsh Government Natural Resources Policy 2017 • The State of Natural Resources Report 2016 • One Wales: One Planet: The Sustainable Development Scheme of the Welsh Assembly Government 2009 • Towards Zero Waste: One Wales: One Planet 2010 • The Wales Transport Strategy: One Wales: Connecting the Nation 2008 • Glastir (agri-environment scheme) • Amaeth Cymru – The future of agriculture in Wales: the way forward 2017 • Woodlands for Wales 2018 • UK Forestry Standard: The Government's approach to sustainable forestry 2017 • TAN 2: Planning and Affordable Housing 2006 • TAN 6 Planning for Sustainable Rural Communities 2010 • TAN 18: Transport 2007 • TAN 21: Waste 2014
Population and human health	Emphasis on preventing illness, on supporting people to manage their own health and wellbeing. Enhanced	• FCERM Strategies, measures etc. arising from the national strategy need to take into account consideration, and where possible	**International / European Plans and Programmes** • Aarhus Convention **European Union (EU) Directives, Strategies & Policy Packages** • EU Noise Directive (2000/14/ec)

	standard of living and the reduction of inequalities. Prosperous, healthy and sustainable local communities. Provision and enhancement of public access and recreation, protection of open spaces and recreational areas.	promotion, of public access and recreation. • FCERM Strategies, measures etc. arising from the national strategy should ultimately deliver improvements to the health and wellbeing of local communities by managing the risk and consequences of flooding and coastal erosion. Open spaces and recreational areas can be created in flood zones therefore FCERM Strategies for making space for water / storage / realignment can complement recreational objectives.	**National Primary / Secondary Legislation** • Active Travel (Wales) Act 2013 • Well-being of Future Generations Act (Wales) 2015 • National Parks and Access to the Countryside Act 1949 • Welsh Language (Wales) Measure 2011 • Welsh Language Standards 2016 **National / Regional / Local Plans and Programmes** • National Development Framework – Issues, Options and Preferred Option 2018 • People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016 • Welsh Government Natural Resources Policy 2017 • The State of Natural Resources Report 2016 • Partnership for Growth: The Welsh Government Strategy for Tourism 2013 – 2020 • Tackling Poverty Action Plan 2013 • TAN 11 Noise 1997 • TAN 13: Tourism 1997 • TAN 16: Sport, Recreation and Open Space 2009 • A Healthier Wales: our plan for health and social care 2018 • All Wales Black, Asian and Minority Ethnic Engagement Project 2017-20 • Cymraeg 2050 – A Million Welsh Speakers • The Strategy for Older People in Wales 2008-13 • Improving lives and communities – Homes in Wales 2010
Cultural Heritage	Sustainable development in relation to historic	• Potential constraints to flood and coastal erosion risk	**International / European Plans and Programmes** • UNESCO World Heritage Convention 1972

	assets through conservation and enhancement.	management strategies, especially those that accept / encourage setback / realignment – exposure of historic assets to greater erosion / flooding. • Can also help deliver or contribute to heritage aims and objectives for the protection of historic assets.	**National Primary / Secondary Legislation** • Historic Environment (Wales) Act 2016 • Well-being of Future Generations Act (Wales) 2015 • Ancient Monuments and Archaeological Areas Act 1979 • Protection of Wrecks Act 1973 • The Historic Buildings and Ancient Monuments Act 1953 • Planning (Listed Buildings and Conservation Areas) Act 1990 **National / Regional / Local Plans and Programmes** • National Development Framework – Issues, Options and Preferred Option 2018 • People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016 • TAN 24: The Historic Environment 2017 • Welsh Government Natural Resources Policy 2017 • The State of Natural Resources Report 2016 • Local Planning Authority Local Plans (various) • Register of Landscapes of Historic Interest 2001
Landscape	Legislation and policy to protect existing sensitive landscapes (such as National Parks and AONBs), and to promote the enhancement of natural beauty and amenity of inland	• Legislation to protect important landscape designations, which may constrain the implementation of FRM measures in sensitive landscape areas.	**International / European Plans and Programmes** • The European Landscape Convention 2004 • UNESCO - World Heritage Convention 1972 **National Primary / Secondary Legislation** • Well-being of Future Generations Act (Wales) 2015 • National Parks and Access to the Countryside Act 1949 • Countryside and Rights of Way Act 2000 **National / Regional / Local Plans and Programmes** • National Development Framework – Issues, Options and Preferred Option 2018

	and coastal waters.		• People, Places, Futures: The Wales Spatial Plan 2008 Update • Draft Planning Policy Wales (Edition 10) 2018 • Planning Policy Wales (Edition 9) 2016 • Welsh Government Natural Resources Policy 2017 • The State of Natural Resources Report 2016 • Policy Statement for the National Parks and National Park Authorities in Wales 2007 • Rural Development Programme for Wales 2014-2020 • NRW - National Landscape Character Areas 2013 • National Seascape Assessment for Wales 2015 • AONB Management Plans / National Park Management Plans (various) • Register of Landscapes of Historic Interest 2001

Appendix 2: Scoping Consultation Responses Summary

Organisation responding	Response to SEA scoping consultation for the National Strategy for Flood and Coastal Erosion Risk Management in Wales	Action taken
WG Forestry	Appendix 1: Highlighted the relevance of Woodlands for Wales Strategy 2018 to water and flood risk management- attention to the specific objective in the strategy: 6.5 “trees contribute to soil and water management”. Indicated relevance also to the climate change and biodiversity sections. Suggested inclusions: 4.2: under Relation to National FCERM Strategy- “creation of wetlands and woodlands…” 4.3: “improvements in land and soil management practices, including tree planting…” 4.4: “where nature-based solutions such as woodland creation can have wider benefits…”	Agreed and Scoping Report amended accordingly
Cadw	Update “Plans, Strategies, legislation of relevance” with the following additions: -The Registered Landscapes of Outstanding Historic Interest in Wales & Registered Landscapes of Special Historic Interest in Wales 2001 -Conservation Principles for the Sustainable Management of the Historic Environment in Wales (2011) Update to Cultural Heritage: Overview and Trends: - 3 (not 6) World Heritage sites and a fourth under consideration: Pontcysyllte Aqueduct and Canal, Blaenavon World Heritage Site, The Castles and Town Walls of Edward in Gwynedd and The Slate Industry of N Wales - 4,191 scheduled monuments	Agreed and Scoping Report amended accordingly

	- 30,006 listed buildings, 529 conservation areas and 394 registered historic parks and gardens - Amend Register name: The Registered Landscapes of Outstanding Historic Interest in Wales & Registered Landscapes of Special Historic Interest in Wales 2001 - Replacement of broad indicator classification description with: "current figures indicate that overall, 60 per cent of scheduled monuments inspected are in a stable / improved condition and 15 per cent show deterioration such for them to be categorised as being at risk. The percentage of listed buildings in a stable or improved condition is 75 per cent[2]."	
NRW	**Key Comments**	
1	The development of this second National Strategy FCERM was welcomed and supported, together with the commitment to SEA. The clear and 'easy to follow' structure of the report was noted.	Noted
2	References to the Natural Resources Policy (NRP) and State of Natural Resources Report (SoNRR) were welcomed. However, it was suggested that both documents should be given greater prominence, for example the NRP is only specifically mentioned in the text in relation to biodiversity and ecosystem resilience, whereas its scope is significantly broader.	Agreed. Implementation of the NRP through the FRMS provides opportunities to deliver direct and indirect positive effects. Included reference to this in Section 2 of the Scoping Report. We will consider further at the assessment stage to embed consideration of the NRP across all receptors. Feed back to WG re the need for the strategy to explicitly be in line with the NRP.
3	It was noted that whilst Section 7 of the Environment Act Wales was referenced, insufficient emphasis was given to Section 6- Biodiversity and resilience of ecosystems duty. A stronger emphasis on the Section 6- Duty was suggested, which requires public authorities, in carrying out their functions, to 'seek to maintain and enhance biodiversity… and promote the	Noted. Section 6 - Biodiversity and resilience of ecosystems duty and 7 of the Act are referenced and embedded into the approach to the SEA in Section 2 and to the baseline

	resilience of ecosystems'. Public authorities also have a duty to embed the consideration of biodiversity and ecosystems into their early thinking and business planning, including 'any policies, plans, programmes and projects, as well as their day-to-day activities'.	in Section 4. Minor amendments made to scoping report, but greater prominence will be given to the section 6- Biodiversity and resilience of ecosystems duty during the assessment stage.
4	In relation to climate change, additional information relating to the latest research and publications should be included in section 4.6. Ref Points 27-29 below	See responses to points 27-29 below
5	A number of additional SEA guide questions were suggested ref point 32 below	See responses to point 32 below
6	The statement in Annex 1 that 'National Strategy potentially at odds with policy aims to reduce risk of flooding to sensitive agricultural areas' is not discussed elsewhere. This appears to be a fundamental issue to be considered through sections 3, 4 and 5.,	This is a reference to Planning Policy Wales which promotes conservation of Grade 1, 2 and 3a agricultural land (DEFRA ALC) from development. Reference to this is included in Section 3, 4 and 5. Text added in section 4 to make it more explicit. This will be considered further at assessment stage.
NRW	**Section 1: Introduction**	
7	Clarify introductory statement: 'The assessment identifies the significant effects of the strategy but defers the assessment of spatial implications to lower tiers of plans and projects'. Given that only plans are subject to SEA, do 'projects' refer to Environmental Impact Assessment (EIA)?	Agreed and Scoping Report amended accordingly
8	There have been two Section 18 reports published since the first strategy.	Agreed and Scoping Report amended accordingly
9	Requirement to confirm the life of the strategy.,	No change made. Review period is 8 years unless significant policy updates are required prior to that time.

10	Clarify whether the list of flooding that the strategy considers should include sewer flooding. If sewer flooding is now included it would be useful to have some narrative to explain this.	Comment to be addressed by the strategy.
NRW	**Section 3: Providing a strategic context**	
11	Table 2: Common Themes and Influences from the Plans / Strategies Review Under both *Soils, contaminated land and geology* and *Climate change* reference to the role of trees and woodland as a potential FCERM mitigation measure. Under *Population and human health,* reference to the wider well-being benefits linked to woodland and green infrastructure as an FCERM mitigation measure.	Amendments made to Soil, contaminated land and Geology section of the table and Population and Human Health.
12	Suggestion to amend the text in the *Common themes* column to read as "*Long term protection, sustainable management and improvement of soils and high quality (ALC 1,2,3a) agricultural land. Contaminated land issues and links to pollution of the water environment. Consideration of soil management, agricultural* ***and forestry*** *practices as a potential FCERM mitigation measure"*.	Agreed and Scoping Report amended accordingly
13	Suggestion to amend the text in the *Strategies and opportunities* column to read as "Will encourage the national strategy to consider the impact of its strategies, plans etc. on soils, agricultural land **and forestry, as well as the role of land managers in adopting practices which can help to reduce flood risks**…"	Agreed and Scoping Report amended accordingly
14	Why is this section is called "*Soils, Contaminated Land, Geology*" when section 4.3 refers to "*Land Use, Geology, Soil and Contaminated Land*"? Land use is a much broader term that incorporates how the land is used, in addition to describing the individual components of the system. As such, it invites the development of a more strategic approach to the FCERM, including how all land can be managed in ways that contribute to multiple objectives.	Agreed and Scoping Report amended accordingly
NRW	**Section 4: Environmental context** **4.1. Population & Human Health**	

15	Give context to the Wales Coast Path and Lon Teifi as being examples of a very extensive network of walking and cycling paths and areas, many of which are currently or potentially subject to flooding.	Agreed and Scoping Report amended accordingly
16	Amend “the Wales Coast Path” to “the Wales Coastal Path”. The Wales Coast Path is not one of the 15 National Trails in England and Wales, and more accurate to state *'often spectacular coastal scenery'*, since not all of the Wales Coast Path is *'spectacular coastal scenery'*.	Agreed and Scoping Report amended accordingly
17	Suggested information to be considered in the *Overview and Trends* section: With Reference link to NHS 2018 report: Health and its determinants in Wales Informing strategic planning).	Agreed and Scoping Report amended accordingly
18	Refer to figures referenced under section 4.7 - the numbers at risk from surface water flooding and from coastal erosion (e.g. current figures suggest 163,000 properties (120,000 residential and 43,000 non-residential) at risk from surface water flooding, and an estimated 2126 properties (1944 residential and 182 non-residential) at risk from coastal erosion. These figures would reduce with full implementation of *Shoreline Management Plan 2* policies.	Agreed and Scoping Report amended accordingly
NRW	**Section 4.2 Biodiversity, Flora and Fauna**	
19	A clearer focus is suggested throughout the SEA on ecosystem resilience, in line with the Environment (Wales) Act, and the SMNR principles in Table 1 of the scoping document, in particular: ‘*The SEA must consider the effects of the strategy on the resilience of ecosystems through considering their diversity, connectivity, scale, condition and adaptability. Influencing strategy development to proactively maintain and enhance the resilience of those ecosystems. This goes hand in hand with our S6 Biodiversity and Resilience of Ecosystems duty to seek to maintain and enhance biodiversity as well as the resilience of ecosystems.’*	Agreed and Scoping Report amended accordingly
20	Suggestion to highlight the following legislative duties with respect to biodiversity:	Text added to section 4.2

	• With reference to the Environment (Wales) Act 2016, it is suggested to highlight the duty under Section 6 - Biodiversity and resilience of ecosystems duty, that *a public authority must seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions*.' • When referring to the Section 7 lists of habitats and species of principal importance for maintaining and enhancing biodiversity in relation to Wales, the Welsh Government minister's duty should be referenced - '*take all reasonable steps to maintain and enhance* these habitats and species, *encourage others to take such steps*'.	
NRW	**Section 4.3 Land Use, Geology, Soil and Contaminated Land**	
21	It is suggested that this section is generally weak on the role of trees and woodlands.	Agreed and Scoping Report amended accordingly
22	The Agricultural Land Classification is mentioned on page 8, suggestion that a map would be useful to illustrate where the most agriculturally productive Welsh soils are located, and especially since maps are used for other parts of section 4.	Added to Environmental Report
23	Suggestion to amend the text of the final paragraph in section 4.3 to read "*…Natural flood management techniques have wider benefits than flood risk management as the reduction or slowing of run off can reduce soil erosion, diffuse pollution and GHG emissions, as well as enhancing biodiversity and landscape. Consideration…"*.	Agreed and Scoping Report amended accordingly
24	Recommendations to better link this section to the developing policy environment on land use, especially in view of the UK's impending departure from the EU, the loss of CAP funding for farmers, and the recent Welsh Government consultation on developing two new replacement schemes focussed on Economic Resilience and Public Goods (see *Brexit and our land* linked in Pt 32).	"Brexit & our Land" is a consultation document and so hasn't been included in the PPP review. Added text in the scoping report acknowledging the uncertainty that Brexit will bring, but also an opportunity to influence land management to benefit FRM.

25	Advise that it would be useful to include some clarification in relation to *high quality agricultural soils* – i.e. does this refer to the best and most versatile soils? and include a reference link for the 7% statistic.	Agreed and Scoping Report amended accordingly and map to be included.
NRW	**Section 4.5 Air**	
26	The decision to screen out air quality from further consideration in the SEA is agreed. However, a key pollutant- ammonia- has been omitted from this section	Agreed and Scoping Report amended accordingly
NRW	**Section 4.6 Climatic Factors**	
27	Recommendations for Section: *Overview and* Trends to make amendments, specifically related to latest developments including: • the regulations being laid by WG in 2019 in relation to GHG reduction targets set by the Environment Act • reference to WG Low Carbon Delivery Plan and Climate Change Adaptation Plan being published in 2019 and Dec 2018 respectively	Scoping Report amended to refer to the emerging publications and regulations, but we cannot consider regulations or publications being laid in the future.
Point 28	In *Overview and Trends*, when referring to historic climate statistics and the UKCP09 projections, there is a focus on reference to annual rainfall trends and projections. Important, especially in relation to the FCERM, to include the historical increase in frequency of heavy rainfall events and the projected increase in extreme rainfall events in future (Statistics within the UKCP09 outputs and State of the UK Climate reports). For example: in the past few decades there has been a general increase in annual average rainfall across the UK with the most recent decade (2008-2017) being 8% wetter than 1961-1990. The extremely wet days index shows an increase of 17% when comparing the most recent decade (2008-2017) with the 1961-1990 climatology. The maximum 5-day precipitation showed a general increase across the UK between the 1960s and 2000 of 4%.	Agreed and Scoping Report amended accordingly
29	There could be more explicit mention of the embedded emissions within flood defence schemes in relation to the FCERM Strategy, as well as the direct emissions from pumping stations to manage flood risk.	Agreed, text added to make this more explicit.
NRW	**Section 4.7 Material Assets**	

30	The significant challenges regarding infrastructure such as railway and utility assets along the coast appears to be downplayed. There are lots of these material assets potentially at risk from erosion or flooding along the coast, especially if the *Shoreline Management Plan* policies of managed realignment or no active intervention are implemented. *Shoreline Management Plans* set the policy for the most sustainable approach to coastal management over the next 100 years in the face of climate change – primarily sea-level rise.	Noted. Comment put forward for the Strategy to address.
31	Under section: 'Relation to National FCERM Strategy' - there appears to be a focus on avoiding inappropriate and less emphasis on how to tackle existing material assets which may become increasingly unsustainable due to climate change.	Amended
NRW	**Section 5: How will we undertake the Strategic Environmental Assessment?**	
32	Table 3: Scoping of strategy objectives. Suggestion to include an additional FCERM strategy objective: "*Seeking win-win solutions in which FCERM maximises the delivery of a range of other objectives in line with the aspirations of the Natural Resource Policy and the WBFG Act*".	To be considered by the Strategy itself. SEA is promoting delivery under NRP and WBFGA.
	Table 4: SEA Criteria - Suggested additional guide questions: SEA Objective Will the draft strategy… 1. Population & Human Health Maximise opportunities to improve people's physical and mental wellbeing through: • Increasing and improving access to green and blue space? • Providing opportunities for people to be physically active in the outdoors? • Taking a least restrictive access approach to facilities, infrastructure and open green/blue spaces and places? • Reduce inequalities across the life course? • Reduce levels of social, cultural and economic deprivation? • Maintain and enhance recreation and access opportunities?	Some amendments have been made to the guide questions as below: 1. Population & Human Health: Have not included "maximise opportunities to improve people's physical and mental wellbeing through…. etc". We feel that these points will be captured by the direct and indirect effects of "Maintain and enhance recreation and access opportunities". Other suggestions added.

	2. Biodiversity, flora and fauna Suggest rewording current middle question as follows: • Help to maintain and enhance the • diversity, • condition, • extent and • connectivity of ecosystems, hence increasing ecosystem resilience? 3. Land use, soil, geology and contaminated land • Consider impact on the most productive agricultural land in Wales? • Promote the use of natural flood risk management techniques in those places where such an approach can make the most effective contribution? • Promote tree planting and woodland creation (upstream, downstream and in urban and peri-urban areas) to reduce and mitigate flood risk? 6. Material Assets • Increase the resilience of important material assets and infrastructure to climate change e.g. by re-routing in some locations, which would also help to restore natural resilience, biodiversity, etc?	2. Biodiversity, flora and fauna: amended 3. Land use etc: Bullet points 1 & 4 are already covered by the guide questions, albeit at a high level. Bullet point 2 will be considered by the strategy itself. Bullet point 3 has been incorporated into the guide questions. 4. Material assets: amended The guide questions need to be comparable across all the receptors to ensure that the assessment is balanced. They also need to be appropriate for the type of strategy we are assessing, eg non-spatial & national.
NRW	**Annex 1 Policies, Plans and Programmes to be considered by the SEA**	
	Comments relating to the *Common themes* column: Marine and Coastal • This refers to restricting inappropriate development but should also refer to adapting where required to. Planning, transport and infrastructure (material assets) • This refers to these assets not having an FCERM impact and looking for opportunities to contribute to managing risk. This should also refer to the potential to adapt existing infrastructure, as discussed above. Soils, contaminated land and geology • Correct and amend "*Soils, Contaminated land Geology*" to "*Land Use, Geology, Soil and Contaminated Land*".	Agreed and Scoping Report amended accordingly. See response to point 6 above in relation to sensitive agricultural areas.

	• The statement "*National strategy potentially at odds with policy aims to reduce risk of flooding to sensitive agricultural areas*" has not been previously discussed. This would be a fundamental issue to be considered under section 5.3, with more discussion on the potential for using agricultural land for multiple purposes, including both natural flood management techniques (to reduce risk) and also for flood storage. It is also not clear what the use of the word *sensitive* means in this context.	
	Additional relevant plans, strategies and legislation for inclusion in Annex 1: Water & Flood Risk Management • Flood Risk Regulations 2009 • Environmental Permitting Regulations 2016 - these cover how we permit flood risk activities and help protect against flooding, but also protect the environment. Population & Human Health • Wellbeing Plans • Welsh National Marine Plan- covers well-being of coastal communities. • Health and its determinants in Wales, Public Health Wales Observatory 2018. (Reference NHS Report 2018: Health and its determinants in Wales Informing strategic planning) Soils, contaminated land and geology • Woodlands for Wales 2018 • Purpose and Role of the Welsh Government Woodland Estate • Brexit and our land consultation document https://beta.gov.wales/sites/default/files/consultations/2018-07/brexit-and-our-land-consultation-document_0.pdf The future of land management in Wales	Scoping Report amended. Well-being plans have not been included in the review as the review is being undertaken at a national level. The WFGA, Well-being goals and WG WBO are all considered. WNMP is not included as it has not yet been adopted. Brexit consultation document not included, as it is a consultation not a publication.

	https://www.assembly.wales/laid%20documents/cr-ld10995/cr-ld10995-e.pdf	

Appendix 3: Tables A1-A3: Assessment of significant environmental effects of the Strategy

TABLE A1: Strategy Objective: Improving our understanding and communicating flood risk

Composition of Strategy Objective:

- Flood and coastal risk information mapping and communication of risk – Screened out of SEA
- **FRMP and SMP. Development of a process for challenging SMP policies – Screened in to SEA**
- Coastal Monitoring – Screened out of SEA

Outputs / Methods to Deliver Strategy Objective:

RMA's managing risk to communities from coastal erosion or flooding, where the SMP policy may increase risk by recommending "no active intervention" or "managed realignment", would have the opportunity to review and challenge policies taking into account more detailed local studies and most current data. Development of process for challenging SMP policies to embed environmental and sustainability considerations.

Whilst development of a process, in itself, will not lead to environmental effects, the changing of SMP2 policies could. This is the focus for the assessment undertaken below which can then be used to feed in to the design of the process.

Environmental Receptor and SEA Objective	Assessment criteria. Does the proposed objective…..	Description of Effect	Significance of Effect	Opportunities and mitigation
Population and Health To support attractive,	• Maintain and enhance the health and well-being of communities?	There could be the reduction of risk of coastal erosion and flooding for certain communities into the future resulting in significant beneficial effects on communities, in terms of	+	Opportunities to maximise multiple benefits associated with flood risk assets by working with Public Service Boards and local communities.

resilient and viable communities, maximising peoples physical and mental well-being.	• Reduce levels of social, cultural and economic deprivation? • Reduce inequalities across the life course? • Maintain and enhance recreation and access opportunities?	improved wellbeing, reducing stress brought about by flood events and reduction in the occurrence of property blight. Areas of deprivation and social inequality are sectors of communities most vulnerable to flood risk and least able to cope with the consequences of flooding. Therefore, improved resilience in coastal communities can have significant benefits. By maintaining existing policy along the coast, it is likely that recreation and access assets will also be maintained.		Opportunities to enhance public health and well-being through improved access to green corridors, urban greenspaces and recreational opportunities
Biodiversity, Flora and Fauna To maintain and enhance a biodiverse natural environment with healthy, functioning ecosystems that support social, economic and ecological resilience and	• Help to maintain and enhance internationally and nationally designated sites, with the aim of restoring them to favourable condition? • Help to maintain and enhance the: Diversity, Condition,	Where the change process is recommending a change in policy to hold the line, rather than realign or remove intervention, there is potential for coastal squeeze having adverse effects on coastal habitats and species, affecting their ability to reach favourable condition. The draft HRA concludes that significant effects cannot be ruled out such that site integrity may be affected. The HRA outlines the consideration under Article 6(4) of the Habitats Directive. The assessment is necessarily precautionary and	-	The SMP2 HRA and SEA predicted effects based on the proposed policies and the development of a process for policy challenge will need to consider the review of these assessments. This will need to include a review of the Article 6(4) consideration which sets out the justification, alternatives considered, reasons of overriding public interest and compensatory mechanisms. The process for challenge must consider and demonstrate the technical, economic and environmental implications of change and apply

the capacity to adapt to change.	Extent and Connectivity of ecosystems, hence increasing ecosystem resilience and adaptability? • Help to maintain and enhance Wales' priority habitats and species?	compensation and mitigation is possible. Potential beneficial effect on freshwater habitats and species that would continue to be protected from saline intrusion by the maintaining of coastal defences. It is thought unlikely that the challenge process would be applied to change hold the line policies to managed realignment or no active intervention, given that RMA's focus is managing risk to the most at risk communities. The significant adverse effect has therefore been based on challenging managed realignment or no active intervention policies.		the principles of SD and SMNR and section 6 duties. The NHCP is the compensatory mechanism for habitat loss where it is not possible to fully mitigate effects locally. The NHCP must be reviewed and updated where changes to SMP policy are proposed. Opportunity, when implementing the objectives to protect communities to use nature-based solutions such as green engineering and seek to work with natural processes and in so doing maximise delivery of biodiversity enhancement, as required under Section 6 - Biodiversity and resilience of ecosystems duty of the Environment Act.
Land Use, Geology, Soil and Contaminated Land To maintain and enhance soil and geology as an important	• Protect and Conserve soil quality and function (including carbon sequestration) and increase resilience to degradation?	Maintaining existing SMP policies could have benefits by protecting soils and agricultural land and cutting off pathways for diffuse pollution between contaminated land and the coast. Coastal geodiversity and coastal processes could be adversely affected by continuing to hold the	**0**	Coastal modelling will be required at a local level to determine the effects and to inform the decision over a change in policy. It is recommended that this technical information be required by the change process. Application of predictive modelling of coastal processes during early

resource and support sustainable use of land for multiple benefits.	• Help to protect and avoid damage to Wales' geodiversity?	line of coastal defence. However, changing the policy also has the potential for adverse effects. At a national scale, the overall effects of changing SMP policy are considered to be neutral.		project design phase to identify potential transport of harmful environmental contaminants or changes to geodiversity and coastal processes. This will allow negative effects to be avoided, reduced or mitigated.
Water Resources and Quality To maximise the sustainable management of water resources and help achieve the objectives of the WFD	• Contribute to the protection and improvement of the water environment, for the benefit of the human and/or natural environment?	Potential benefits for the water environment, in terms of water quality (e.g. cut-off of contaminant pathways, prevention of saline intrusion of important groundwater bodies on the coast). However, could also mean conflict in terms of effects on natural hydromorphological functions, depending upon how policies are implemented. Overall therefore considered neutral, but likely to be a mixture of beneficial and adverse effects, the significance of which depends upon the nature of policy change proposed.	**0**	Emphasis on nature-based solutions when implementing coastal SMP policies to maintain/restore hydromorphological function.
Climatic Factors To limit the causes and effects of	• Promote a reduction directly or indirectly, in greenhouse gas (GHG)	Potential adverse effects on GHG emissions if changes in policies require active intervention in terms of building / maintaining defences or operating pumping stations.	**0**	Nature-based solutions, solutions that seek to minimise the use of non-renewable or high-energy (e.g. steel or concrete) resources should be sought in the maintenance or construction of defences.

climate change and ensure resilience and adaptation to any consequences of climate change	emissions as a contribution to climate change? • Contribute to Wales' ability to adapt to climate change?	Potential benefits to local communities in promoting a planned adaptation to the effects of climate change around the coast, in line with the emerging Climate Change Adaptation Delivery Plan for Wales. With the implementation of the suggested mitigation, development of a method to amend SMP policies, is considered neutral at a national scale.		Renewable energy should be used in the operation of assets where possible.
Material Assets To promote sustainable management and resilience of existing material assets and infrastructure	• Conserve and protect important material assets and infrastructure? • Increase the resilience of important material assets and infrastructure to climate change?	Delivery of this objective will protect material assets around the coast and allow adaptation to future predictions of climate change. This includes houses, utilities and businesses in coastal communities, as well as travel infrastructure such as railways and roads.	+	
Cultural Heritage To protect and sustainably	• Conserve and where possible enhance, protected and important	Although unlikely to be the principal focus of prioritised investment, delivery of this objective could provide secondary benefits by protecting cultural	+	Early engagement of and partnership with the relevant heritage organisations in any proposals to amend SMP2 policies is recommended. This will facilitate

manage the historic environment including cultural heritage resources, historic buildings and archaeological features	cultural heritage assets?	heritage assets around the coast, allowing adaptation to future predictions of climate change.		the identification and mitigation for assets with historic value.
Landscape and Seascape To maintain and enhance Wales' landscape and seascape character	• Ensure the landscape and seascape character of Wales is conserved and, where possible, enhanced?	Maintaining hold the line policies is unlikely to have adverse effects on landscape and seascape in the short term, but longer term adverse effects could be brought about by the need to raise the height or improve the structural integrity of defences as sea levels rise. The significance of effects will depend upon the nature of policy implementation.	**0**	Promoting nature-based solutions that minimise damage to the environment and seek to deliver biodiversity benefits are all consistent with minimising adverse effects on the landscape and seascape.

TABLE A2: Strategy Objective: Prioritising investment to the most at risk communities

Composition of Strategy Objective:

- **Interventions to reduce flood risk – Screened in to SEA**
- **Interventions to utilise the option appraisal continuum (no intervention, NFM to Grey engineering) – Screened in to SEA**
- Use of NFM opportunity maps for developing catchment-based approaches – Screened out of SEA
- NFM research and monitoring to develop approach and improve understanding – Screened out of SEA
- **Acknowledge role of hard engineering whilst encouraging green/grey hybrid interventions – Screened in to SEA**

Outputs / Methods to Deliver Strategy Objective:

Actions include implementing a programme of improvement works in line with investment priorities. Interventions to reduce flood risk are prioritised according to risk using the Communities at Risk Register and evidence of flood events alongside supporting information on properties and wider benefits. To help direct investment and mitigate flood risk, the National Asset database will be developed by the end of 2020, as a key data information tool to help understand and mitigate risk. Interventions should utilise the option appraisal continuum (no intervention, NFM through to Grey (hard) engineering) to work with natural processes when possible and new appraisal guidance requires at least one NFM option to be included in each business case. Continue research and monitoring in to NFM to further develop the approach and improve understanding of impact and effectiveness.

Environmental Receptor and SEA Objective	Assessment criteria. Does the proposed objective…..	Description of Effect	Significance of Effect	Opportunities and mitigation
Population and Health To support attractive, resilient and viable communities, maximising	• Maintain and enhance the health and well-being of communities? • Reduce levels of social, cultural and	Communities at greatest risk protected from flooding and coastal erosion will result in significant beneficial effects to communities' health and well-being. Improved prioritisation of protection to the most vulnerable communities at risk with limited capacity to	+	Actions to reduce and manage flood risk and minimise related stress in vulnerable communities at risk should be linked in with the relevant local Well-being Plan. Enhancement of public health and well-being through improved physical environment improvements

peoples physical and mental well-being	economic deprivation? • Reduce inequalities across the life course? • Maintain and enhance recreation and access opportunities?	recover from flood consequences, whilst enhancing of their physical environment, would result in beneficial effects with delivery of social justice for a more equal Wales and supporting sustainable communities. The promotion of nature-based solutions in options appraisal has potential beneficial effects on recreation and access to green recreational areas and waterside environments.		and access to green corridors, urban greenspaces and recreational opportunities.
Biodiversity, Flora and Fauna To maintain and enhance a biodiverse natural environment with healthy, functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change	• Help to maintain and enhance internationally and nationally designated sites, with the aim of restoring them to favourable condition? • Help to maintain and enhance the: Diversity, Condition, Extent and Connectivity of	Potential for delivering beneficial effects related to implementing innovative nature-based solutions to flood and coastal erosion - protecting and enhancing local ecosystem structure, function and biodiversity. Prioritising of investment in light of increased pressure on public finances may result in lack of funding and therefore neglect of biodiversity issues, particularly wider biodiversity (beyond protected / priority sites / species). However, potential for adverse impacts depends on the nature of the solutions proposed, therefore	**0**	Opportunity to work with natural processes to manage flood risk and enhance biodiversity and ecosystem resilience through habitat creation, green engineering and natural management techniques, in line with Section 6 - Biodiversity and resilience of ecosystems duty of the Environment Act. Section 6 - Biodiversity and resilience of ecosystems duty for RMA's to deliver net biodiversity enhancements through their operations should mitigate the potential negative effect on biodiversity.

	ecosystems, hence increasing ecosystem resilience and adaptability? • Help to maintain and enhance Wales' priority habitats and species?	uncertainty over significance of the effects. The strategy recognises the need for traditional hard-engineered defences in some cases, which can result in reduction / fragmentation / reduction in quality of valuable habitat along river corridors and in the coastal zone. The strategy recommends that interventions should utilise the option appraisal continuum and include an NFM option. This will encourage interventions that utilise nature-based solutions – including hybrid options, that help to build ecosystem resilience and result in beneficial effects on biodiversity. Given the greater focus on NFM and the need to include NFM options in the short list for interventions and to deliver multiple benefits the overall effect on biodiversity of this objective is considered likely neutral.		The NHCP provides a cost-effective means of offsetting overall impacts of FCERM on coastal habitats, where it is not possible to fully mitigate effects locally. Potential opportunity to protect and conserve local ecosystem biodiversity through implementation of hybrid flood risk solutions. Potential to contribute to improving ecological status of water bodies by identifying synergies between FCERM solutions and WFD measures. An opportunity to work collaboratively with others (e.g. conservation bodies, wildlife trusts / organisations) when developing FCERM solutions, to continue to deliver sympathetic solutions with wider biodiversity benefits.
Land Use, Geology, Soil and Contaminated Land	• Protect and Conserve soil quality and function (including	The strategy promotion of nature-based solutions and NFM will result in land and soil protection, and a reduced risk of diffuse pollution from the transport of contaminants	**0**	Opportunity to move towards sustainable land and soil management practices to deliver flood risk management alternatives that improve water retention and

To maintain and enhance soil and geology as an important resource and support sustainable use of land for multiple benefits	carbon sequestration) and increase resilience to degradation? • Help to protect and avoid damage to Wales' geodiversity?	mobilised into watercourses, where such measures are implemented. This will result in a significant beneficial effect on soil and contaminated land. Implementation of these measures has the potential to effect land use and land management practices and whilst this may change, it cannot be predicted at this scale whether this would be beneficial or adverse. It would be considered further at a project scale. Effects are dependent on the type of investments prioritised, that will directly affect catchment processes. Implementing traditional solutions that rely on defences alone are likely to have more adverse effects with increased likelihood of inundation and associated soil function impacts on soil quality and pollution transport. However, the promotion of nature-based solutions could mitigate these effects, resulting in this assessment concluding overall neutral effect.		soil structure resulting in increased water infiltration during extreme weather events. Potential to implement natural flood management techniques that deliver FCERM solutions with wider environmental benefits, such as reducing or slowing runoff that subsequently reduces both soil erosion and diffuse pollution. Taking account of location of contaminated land during development of FCERM solutions and provide opportunities for key parties to work together to remediate contaminated land and bring land that has already been contaminated back into use. Linking land management solutions to other catchment management schemes such as agri-environment and woodland management, could engage land managers to adopt necessary measures delivering wider flood risk management benefits through improvements to soil functions and reductions in diffuse pollution. RMA's engaging with the development of the Area

				Statements could help identify opportunities for collaborative working.
Water Resources and Quality To maximise the sustainable management of water resources and help achieve the objectives of the WFD	• Contribute to the protection and improvement of the water environment, for the benefit of the human and/or natural environment?	For the highest priority investment areas, likely positive benefits for the water environment is expected – positively impacting both aquatic and coastal water quality status, by restricting contaminant transport into local watercourses and prevention of saline intrusion of coastal groundwater. Dependent on the nature of proposed solutions, the natural hydromorphological functions could be impacted, resulting also in negative effects. Overall therefore considered neutral, but likely to be a mixture of beneficial and adverse effects, the significance of which depends on the nature of solutions proposed.	**0**	Opportunity for flood and coastal erosion risk management to embrace, facilitate and deliver WFD objectives to prevent water body deterioration and improve water quality status (chemical, biological and physical). Contribute to WFD objectives through the 3rd cycle RBMPs, to maximise both the qualitative and quantitative status of water bodies. Seek to maximise opportunity to work with natural catchment processes for hydrological improvements by implementation of innovative alternatives to traditional grey engineered defences.
Climatic Factors To limit the causes and effects of climate change and ensure	• Promote a reduction directly or indirectly, in greenhouse gas (GHG) emissions as a contribution to	Prioritised investment into nature-based solutions that tap into natural processes to protect and enhance existing ecosystem - build natural resilience, and create new habitats, has the potential for significant beneficial climate mitigation effects	**0**	Promote sustainable development and infrastructure opportunities that actively reduce GHGs. Adopt solutions that work with natural processes such as wetland creation / woodland planting, can provide carbon sequestration,

resilience and adaptation to any consequences of climate change	climate change? • Contribute to Wales' ability to adapt to climate change?	eg creation of wetlands and carbon sequestration. Dependent on the investment solutions proposed since traditional hard engineering has significant negative effects with respect to mitigating climate change effects and deliver a significant carbon footprint. Prioritising the highest risk areas / communities vulnerable to flooding and coastal erosion will result in significant beneficial effects on the country's ability to adapt to climate change.		hence contributing to mitigating climate change whilst also benefit natural systems in adapting to effects of climate change. Apply an integrated sustainable approach to flood risk management with consideration to wider catchment consequences and benefits, such as upstream flood storage or natural flood management measures to deliver carbon sequestration whilst also managing flood and coastal erosion. Opportunity to contribute to the Welsh Government's climate change objectives and targets.
Material Assets To promote sustainable management and resilience of existing material assets and infrastructure	• Conserve and protect important material assets and infrastructure? • Increase the resilience of important material assets and infrastructure to	Investment into protection of existing infrastructure has the potential to significantly benefit local communities and national interests.	+	Future investment decisions should reflect the SD principle, including wider social costs and benefits as well as specific consideration of risk to life and environmental impacts. Future predicted pressures on land availability for development due to increased flood and coastal risk opens new opportunities for development of environmentally sustainable infrastructure that may deliver wider benefits such as new

	climate change?			recreational opportunities and habitat improvements
Cultural Heritage To protect and sustainably manage the historic environment including cultural heritage resources, historic buildings and archaeological features	• Conserve and where possible enhance, protected and important cultural heritage assets?	Secondary benefits likely to heritage assets in areas designated for protection, although unlikely to be a priority for investment. Potential negative effects in areas not prioritised for investment are possible - areas of cultural importance may be at risk dependent on the type and location of flood and coastal infrastructure proposed. Overall therefore neutral, but likely to be a mixture of beneficial and adverse effects.	**0**	Prioritising FCERM actions should provide the benefit of helping to prioritise important heritage sites at risk from flooding and erosion for recording before they are lost. Attention should be given to the design of FCERM measures that directly affect historic assets or their setting, most appropriately considered at the project level. Approaches that work with natural processes may help to manage flood risk in a way that is less damaging to the historic environment. Implementation of resilience measures can also potentially be applied to heritage assets.
Landscape and Seascape To maintain and enhance Wales' landscape and seascape character	• Ensure the landscape and seascape character of Wales is conserved and, where possible, enhanced?	Potential for adverse effects depends on the nature of solutions proposed, therefore uncertainty over significance of effects. Beneficial landscape effects are to be gained from prioritising investment into nature-based FCERM solutions that are sensitive	**0**	The promotion of nature-based solutions by the FCERM Strategy, has the potential to deliver positive effects on the landscape and seascape of Wales. Promoting solutions that work with natural processes, minimising damage to the environment and seeking to provide environmental

		to the environment, and that deliver wide-reaching landscape benefits on both a regional and national scale. Financial pressures could potentially result in an adverse landscape effect due to a lack of prioritised investment into the design of environmentally sensitive FCERM solutions.		benefits are all consistent with minimising adverse effects on the landscape, for example, reverting floodplains back to their natural states, coastal processes will again naturally shape our coastline ecosystems. Where the use of hard engineering is unavoidable, innovative solutions and sympathetic design should be used to deliver designs that are sensitive to landscape character.

TABLE A3: Strategy Objective: Preventing more people becoming exposed to risk
Composition of Strategy Objective: • **Managing flood risk development – Screened in to SEA** • **SUDS requirement from January 2019 – Screened in to SEA** • **Coastal adaptation – Screened in to SEA** • **RMAs must consider coastal adaptation management plans with respect to climate change and raise awareness in local communities – Screened in to SEA** • **Continuation of NHCP to monitor and predict impacts on N2K intertidal sites. Aims to also deliver projects that facilitate RMA to proactively manage coastal flood risk through compensatory habitat creation– Screened in to SEA** • **Asset maintenance – programme for regular maintenance of assets– Screened in to SEA**

Outputs / Methods to Deliver Strategy Objective: Welsh Government's policy of directing development away from areas of high flood risk and managing water is set out in Planning Policy Wales and Technical Advice Note (TAN) 15 which is being updated alongside this strategy. SMP policies are a material consideration in planning and in Local Development Plans promoting coastal adaptation to climate change. Actions included under this element are issues in relation to planning policy, Local Development Plans and strategic policy. Where coastal adaptation requires the maintenance or improvement of defences the strategy promotes the NHCP to proactively monitor and predict the effects of coastal squeeze on European sites and to deliver compensatory habitat where losses are predicted.				
Environmental Receptor and SEA Objective	**Assessment criteria. Does the proposed objective…..**	**Description of Effect**	**Significance of Effect**	**Opportunities and mitigation**
Population and Health To support attractive, resilient and viable communities, maximising peoples physical and mental well-being	• Maintain and enhance the health and well-being of communities? • Reduce levels of social, cultural and economic deprivation? • Reduce inequalities across the life course? • Maintain and enhance recreation and access opportunities?	Informed communities that are effectively supported by efficient emergency response will develop flood and coastal erosion resilience and be better equipped to respond to events, reduce stress and improve general well-being. Significant effects are expected across all communities, and vulnerable communities less capable of coping with adverse consequences of flooding benefiting significantly. Planning policies that manage and restrict developments in high risk areas such as floodplains, will prevent communities being at risk and becoming at risk when considering future trends of climate change. This will result in	+	Risk management authorities should work with the Public Service Boards and local Wellbeing Plans to address the vulnerable sectors in communities, to support those least resilient to consequences of flooding and coastal erosion. In the delivery of habitat or maintenance of defences, opportunities should be sought that maximise the delivery of benefits to the health and wellbeing of local communities e.g. through maximising recreational and access benefits

		significant positive effects on a national scale.		
Biodiversity, Flora and Fauna To maintain and enhance a biodiverse natural environment with healthy, functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change	• Help to maintain and enhance internationally and nationally designated sites, with the aim of restoring them to favourable condition? • Help to maintain and enhance the: Diversity, Condition, Extent and Connectivity of ecosystems, hence increasing ecosystem resilience and adaptability? • Help to maintain and enhance Wales' priority habitats and species?	Development restrictions in areas at risk of flooding and coastal erosion will likely have significant beneficial effects on the conservation of these natural habitats, enabling enrichment of natural biodiversity. Effects are dependent on the nature of proposed developments. Construction of new or maintenance of existing defences may have adverse effects with expected traditional hard engineered defences potentially resulting in loss of ecosystem connectivity, fragmentation and loss of important habitats. Nature-based solutions and habitat creation that are catchment focused are likely to result in ecosystem resilience and biodiversity gains. Implementation of SuDS features that manage development run-off are likely to result in beneficial effects to ecosystems with resulting gains for biodiversity.	**0**	Priority to integrate management solutions that work with natural processes, with a focus on supporting, protecting and enhancing biodiversity in line with the Section 6 - Biodiversity and resilience of ecosystems duty. Potential FCERM solutions should contribute to improving the ecological status of water bodies by exploring synergies with WFD measures. Opportunities exist to protect and improve both water quality and biodiversity with implementation of Sustainable Drainage Systems (SuDS) into development plans. The implementation of the NHCP will help provide cost effective means to offset FCERM impacts on coastal habitats where it is not possible to fully mitigate effects locally. In development of FCERM solutions, opportunities exist for

		Overall a neutral effect is predicted. Opportunities for the conservation of habitats through the restriction on development must be considered against the need to adapt and compensate for losses brought about through coastal squeeze.		RMA's to explore and consider alternative funding streams whilst collaborating with others (eg conservation bodies, wildlife trusts and organisations) and achieve wider biodiversity gains with environmentally sensitive management solutions. RMA's should engage with the Area Statement process to identify opportunities for collaboration. Opportunity to maintain existing network of flood defences in a manner that maximises biodiversity e.g. through seeding and mowing to maximise benefit for pollinators.
Land Use, Geology, Soil and Contaminated Land To maintain and enhance soil and geology as an important resource and support sustainable use	• Protect and Conserve soil quality and function (including carbon sequestration) and increase resilience to degradation? • Help to protect and avoid damage to	Restricting and avoiding development in flood risk areas could potentially have significant effects on protecting soil function i.e. maintaining important buffer areas along river corridors. Disturbance to land would also be avoided, hence reducing risk of contaminant mobilisation into adjacent watercourses. Integration of effective SuDS drainage systems would help	**0**	Opportunity to move towards sustainable land and soil management practices to deliver flood risk management benefits that would also benefit and protect soil structure and prevent soil erosion and diffuse pollution. The location of contaminated land should be identified and considered at early stages of FCERM plans. Opportunities exist to collaborate with key parties to remediate existing contaminated land and return to use.

of land for multiple benefits	Wales' geodiversity?	manage excess water run-off and help prevent erosion. Implementing innovative land management solutions has significant potential to also help reduce soil erosion and diffuse pollution with associated contaminant release. Management solutions that involve construction of defences or reduced flood risk management in agricultural areas may result in compromised soil structure and function.		
Water Resources and Quality To maximise the sustainable management of water resources and help achieve the objectives of the WFD	• Contribute to the protection and improvement of the water environment, for the benefit of the human and/or natural environment?	Restricting and avoiding inappropriate development in flood risk areas are likely to have significant beneficial effects to local water quality status and hydromorphological function eg maintaining buffer areas adjacent to watercourses that would also facilitate and reinforce habitat connectivity. Actions to increase resilience and manage polluted sites may potentially have significant beneficial effects on improving	+	Implementation of Natural Flood Management techniques by RMA's and partners to meet and maximise WFD objectives to improve hydrological and geomorphological processes. In the management of flood risk, opportunities should be sought to deliver measures recommended within the relevant RBMP that are aimed at improving the ecological status or potential of waterbodies. Innovative catchment and land management-based solutions may be identified and delivered through

		water quality status, by reducing diffuse pollution. Effective SuDS catchment drainage management is likely to have beneficial effects on the water environment, but will depend on the nature, construction and maintenance demands of these systems.		collaboration with land managers through the Area Statement process.
Climatic Factors To limit the causes and effects of climate change and ensure resilience and adaptation to any consequences of climate change	• Promote a reduction directly or indirectly, in greenhouse gas (GHG) emissions as a contribution to climate change? • Contribute to Wales' ability to adapt to climate change?	Significant beneficial effects are expected to result from proposed FCERM Strategy actions to manage the consequences of Climate change and help Wales adapt to new climate challenges related to increases in extreme rainfall events, storm surges/intensity, increased river flows and sea level rise. Avoiding inappropriate siting of developments within the floodplain and implementing SuDS, will ensure that long term plans for development, and their supporting drainage infrastructure, can make a significant contribution to managing and adapting to climate change pressures.	+	Explore and adopt FCERM solutions that work with natural processes and protect and enhance the existing natural resources of Wales such as peatlands, wetlands, soils and forests, that absorb and store carbon to contribute to climate change mitigation. Opportunities to manage and maintain the significant existing network of FRM assets in a way that minimises the emission of GHG.

		Overall significant positive in relation to adaptation and neutral for mitigation.		
Material Assets To promote sustainable management and resilience of existing material assets and infrastructure	• Conserve and protect important material assets and infrastructure? • Increase the resilience of important material assets and infrastructure to climate change?	Measures and actions to plan adaptation of the coast to climate change has potential benefits on important infrastructure located around the coast such as rail and road networks. Managing run-off through SuDS may help conserve existing infrastructure. Overall beneficial effects, although not significant given uncertainty in the scale of delivery.	**0**	Future investment decisions should reflect sustainable development principles, including wider social costs and benefits as well as specific consideration of risk to life and environmental impacts.
Cultural Heritage To protect and sustainably manage the historic environment including cultural heritage resources, historic buildings and	• Conserve and where possible enhance, protected and important cultural heritage assets?	Managing flood risk through improving communication, resilience, emergency response and catchment run-off is unlikely to have significant adverse effects on cultural heritage assets and could result in benefits where heritage structures are protected. The construction and maintenance of defences and SuDS could have an impact on cultural heritage assets, however this is dependent on design type and location.	**0**	Approaches should consider the sensitivity of historic assets including their settings and seek to avoid damage to the historic environment. The development of specific mitigation for the protection / conservation of cultural heritage assets will need to be considered at the project level. Working with natural processes and implementation of resilience measures may help to manage flood risk in a way that is less

archaeological features		Overall it is not possible to say if this objective will have a significant impact at this national level, therefore neutral.		damaging to the historic environment. Coastal adaptation should include recommendations to record sites that are at risk of being lost, where a case cannot be made to protect and preserve.
Landscape and Seascape To maintain and enhance Wales' landscape and seascape character	• Ensure the landscape and seascape character of Wales is conserved and, where possible, enhanced?	Supports approaches sensitive to landscape character, with avoidance of development in flood or coastal erosion risk areas within the land use planning system. Implementation of both coastal flood risk management actions and adaptation have potential for significant effects to both Landscape and seascape, the extent of which will depend on the nature and location of interventions. The NHCP has the potential to restore natural coastal habitats, the significance of effects will depend upon the scale and location of these projects. Construction and maintenance of coastal defences and SuDS	**0**	Promote FCERM solutions that integrate natural processes to increase resilience, with the aim of long-term environmental benefits and minimal impact on the landscape. Specific consideration is required where FCERM interventions lie within or in the vicinity of the designated landscapes in Wales, including AONBs / National Parks / Heritage Coast / Special Landscape Areas. Sensitive/sympathetic design approaches of proposed resilience measures are necessary in sensitive landscape settings such as AONBs and conservation areas.

		drainage management could have an adverse impact of landscape character; however, opportunities exist that could mitigate this effect.		

Appendix 4: Environmental effects of alternatives

Environmental Receptor and SEA Objective	2011 Strategy Objectives		
	Prioritising investment in the most at risk communities.	**Reducing the impacts on individuals, communities and businesses from flooding and coastal erosion.**	**Providing an effective and sustained response to flood and coastal erosion events.**
Population and Health To support attractive, resilient and viable communities, maximising peoples physical and mental well-being.	Communities at greatest risk protected from flooding and coastal erosion will result in significant beneficial effects on communities, in terms of improved wellbeing, reducing stress of flood events. The effects between 2011 and 2019 objectives are comparable.	Communities with higher resilience and improved emergency response will result in significant beneficial effects on communities, in terms of improved wellbeing, reducing stress of flood events. The 2011 strategy had less emphasis on working with communities and working collaboratively between RMA's. Work on planning policy will ensure that inappropriate development is not sited within the floodplain, placing future communities at risk.	Providing effective and sustained responses to flood events will result in beneficial effects on human health and wellbeing, due to quicker and more effective recovery. The effects between 2011 and 2019 objectives are comparable.

Biodiversity, Flora and Fauna To maintain and enhance a biodiverse natural environment with healthy, functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change.	Potential for adverse effects depends on the nature of the solutions proposed. The 2011 strategy had less emphasis on seeking solutions that work with natural processes. Traditional hard-engineered defences can result in adverse effects on ecosystem resilience. The 2019 strategy objective, **requires** that all interventions consider natural flood management options at appraisal. Therefore, it is considered that the 2011 strategy objective would have resulted in greater adverse effects in comparison to 2019 or missed opportunities to deliver enhancements.	Actions to improve resilience and emergency response would not have a significant impact on biodiversity. Avoiding inappropriate development in flood risk and coastal erosion areas, can benefit areas of high conservation value (designated sites) and will help to protect natural process and conserve habitats and species. The 2011 strategy promoted SuDS, however, this has since been placed into legislation, making it a requirement for new developments.	Supporting actions focus on advanced planning, research, improved resilience and response focused on communities affected by flooding. Emergency works or clean-up operations, have the potential to have adverse effects on biodiversity and ecosystem resilience. The effects between 2011 and 2019 objectives are comparable.
Land Use, Geology, Soil and Contaminated Land To maintain and enhance soil and geology as an important resource and	The 2011 Strategy had less emphasis on natural flood management. This limited the potential for benefits in the protection of soils and reducing risk of diffuse pollution when the focus is on the highest risk / high priority investment areas. The 2011 Strategy recognised the benefits of a catchment management approach on soil	Actions to improve resilience and emergency response would not have a significant impact on soils or contaminated land. Avoiding inappropriate development in the flood plain could help to protect soil function i.e. contribute to maintaining buffer areas along river corridors, not increasing impervious areas adjacent to water bodies.	Actions considered unlikely to result in significant effects on soils or soil function. Improved, more efficient clean-up operations may have minor benefit of reducing diffuse pollution following flood events. The effects between 2011 and 2019 objectives are comparable.

support sustainable use of land for multiple benefits.	and land management but did not require more natural interventions.		
Water Resources and Quality To maximise the sustainable management of water resources and help achieve the objectives of the WFD	The 2011 strategy had less emphasis on natural flood management. This limited the potential for benefits for the water environment, in terms of water quality and the restoration of hydromorphological function for the highest risk / high priority investment areas. The 2011 Strategy recognised the benefits of a catchment management approach on water resources and quality but did not require more natural interventions.	Actions to improve resilience and emergency response are not likely to have significant effects on the water environment. Avoiding inappropriate development in flood risk areas will help protect the water environment, helping to improve hydromorphological function and benefit water quality.	Actions considered not relevant / no effect in relation to morphological function of watercourses. Improved, more efficient clean-up operations, and improved resilience if / where applied to areas at risk of creating / contributing to pollution, potential for water quality benefits. The effects between 2011 and 2019 objectives are comparable.
Climatic Factors To limit the causes and effects of climate change and ensure resilience and adaptation to any	In terms of climate change mitigation, the 2011 strategy had less emphasis on natural flood management and the use of renewable, low carbon materials. It recognised the effect of traditional hard-engineered defences on carbon footprint and recommended alternative, innovative solutions that work with	Actions to improve resilience and emergency response will contribute to climate change adaptation. Avoiding inappropriate siting of developments within the flood plain and implementing sustainable drainage, will ensure that long term plans for development, and their supporting drainage infrastructure, can make a significant contribution to adapting to climate change. It will	Nature of actions supporting the objective mean limited capability to contribute to mitigation of factors contributing to climate change. The actions however will have beneficial effect on the country's ability to adapt to climate change, through advanced planning, improving resilience to flood inundation and the consequences,

consequences of climate change	natural processes, but did not require it, like the 2019 strategy. The 2011 and 2019 strategies are comparable in terms of resulting in significant beneficial effects on the country's ability to adapt to climate change.	be possible to design infrastructure that can accommodate increased rainfall / storm events exacerbated by climate change. The effects between 2011 and 2019 objectives are comparable.	which would otherwise be exacerbated by climate change. The effects between 2011 and 2019 objectives are comparable.
Material Assets To promote sustainable management and resilience of existing material assets and infrastructure	Prioritised investment likely to result in significant beneficial effects on protection of the most important existing infrastructure. The 2011 and 2019 strategies are comparable in terms of the benefits to material assets.	Increasing resilience and improved post-flood recovery has potential to assist in reducing the adverse effect / consequences of flooding on existing infrastructure. Siting development outside of the floodplain will help ensure that new and future assets are protected. Managing catchment run off better may help conserve existing infrastructure (although uncertainty to the level of protection this will provide).	Given the nature of the actions, considered limited ability to conserve important material assets. The effects between 2011 and 2019 objectives are comparable.
Cultural Heritage To protect and sustainably manage the historic environment including cultural heritage resources,	The 2011 and 2019 strategies are comparable as heritage assets are still unlikely to be principal focus of prioritised investment but are likely to be secondary benefit where heritage assets / important features lie within those areas prioritised for protection. With less emphasis on NFM the 2011 strategy could result in more engineered interventions,	Improving resilience and emergency response, and managing catchment run off will not have a significant impact on cultural heritage assets, although improved resilience could result in some benefits, e.g. where applied to listed structures / buildings. Building and maintaining defences and repairing damage could have an impact on, or present conflict	Actions will not conserve heritage assets, nor lead to detrimental effect. Some potential benefit if / where resilience measures consider important heritage, such as listed structures / buildings. The effects between 2011 and 2019 objectives are comparable.

historic buildings and archaeological features	increasing the potential for adverse effects where they are proposed in areas of high cultural / archaeological sensitivity.	with the conservation of cultural heritage assets (e.g. bridges, weirs). The effects between 2011 and 2019 objectives are comparable.	
Landscape and Seascape To maintain and enhance Wales' landscape and seascape character	Potential for adverse effects depends on the nature of the solutions proposed. The 2011 strategy had less emphasis on seeking solutions that work with natural processes. Traditional hard-engineered defences can result in adverse effects on landscape and seascape. The 2019 strategy objective, **requires** that all interventions consider natural flood management options at appraisal. Therefore, it is considered that the 2011 strategy objective would have resulted in greater adverse effects in comparison to 2019.	Improving resilience and emergency response will not have a significant impact on landscape character. Managing catchment run off, building and maintaining defences and repairing damage could have an adverse impact on landscape character. The 2019 strategy objective strengthens the need to consider NFM in catchment runoff management, meaning increased likelihood of delivery of enhancements to landscape.	Actions considered unlikely to result in landscape or seascape effects. Clean-up operations / plans may help to conserve character, although not considered significant. The effects between 2011 and 2019 objectives are comparable.

Appendix 5: Welsh Government Well-being Objectives[18] for 2016-2021

Welsh Government Well-being Objectives for 2016-2021		Strategy contributions
Prosperous and Secure Wales	01 Support people and businesses to drive prosperity	**Prioritisation of flood risk management to the communities most at risk.**
	02 Tackle regional inequality and promote fair work	**n/a**
	03 Drive sustainable growth and combat climate change	**Promotion and intervention to allow climate change adaptation.**
Healthy and Active Wales	**04** Deliver quality health and care services fit for the future	**n/a**
	05 Promote good health and well-being for everyone	**Promotion of multiple benefits and uses of flood risk assets, e.g. Wales Coastal Path, multi-use urban pathways on flood embankments promoting health and well-being.**
	06 Build healthier communities and better environments	**Promotion of nature-based solutions will contribute to ecosystem resilience and improve biodiversity and landscape which will have benefits for health and well-being of the people of and visitors to Wales**

[18] Welsh Government Well-being Statement 2017. Available from: https://beta.gov.wales/sites/default/files/publications/2017-10/prosperity-for-all-the-national-strategy-well-being-statement-2017.pdf [Accessed November 2018].

Ambitious and Learning Wales	**07** Support young people to make the most of their potential	**n/a**
	08 Build ambition and encourage learning for life	**n/a**
	09 Equip everyone with the right skills for a changing world	**n/a**
United and Connected Wales	**10** Build resilient communities, culture, and language	**Consider flood risk in development planning decisions will prevent the stress and anxiety associated with flood events. The work with communities at risk to increase awareness and resilience will also help reduce stress and anxiety associated with flooding in these communities.**
	11 Deliver modern and connected infrastructure	**Ensuring new infrastructure takes into account climate change adaptation, e.g. storm water run-off, sea level rise etc**
	12 Promote and protect Wales' place in the world	**n/a**