Carmarthenshire Local Flood Risk Management Strategy

SEA Environmental Report

APRIL 2025

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Non-Technical Summary

Purpose of the Non-Technical Summary

N.1. This document provides a summary in non-technical language of the Strategic Environmental Assessment (SEA) of Carmarthenshire's 'Local Flood Risk Management Strategy'. Further details can be found in the SEA Environmental Report.

What is the 'Local Flood Risk Management Strategy'?

N.2. The new LFRMS for Carmarthenshire for the period 2024-2030 builds on the previous Flood Risk Management Strategy (2013). The LFRMS focuses on identifying and managing local sources of flood risk and considers management of the risk of flooding and erosion from the sea.

N.3. This LFRMS encapsulates Carmarthenshire's commitment to managing climate change, promoting community resilience and wellbeing, and enhancing the natural environment with nature-based solutions. It also has a community-led focus, facilitating collaboration between citizens, businesses, and the council to create tailored solutions and strategies that are rooted in the local population's needs and aspirations.

What is the Strategic Environmental Assessment

N.4. SEA is a requirement of several pieces of legislation including the European Directive 2001/42/EC on 'the assessment of the effects of certain plans and programmes on the environment' (The Strategic Environmental Assessment Directive). The SEA Directive is implemented in Wales through the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004, and Welsh Government has set out guidance for preparing SEAs.

N.5. SEA is a process of assessing the contents of the LFRMS, as it is written, against a series of sustainability objectives in order to help promote sustainable development and test the LFRMS before it comes into force. The SEA has been undertaken alongside the preparation of the LFRMS, and it has been able to feedback recommendations to improve the relative sustainable development performance of the LFRMS. The SEA is high-level and considers both positive and negative effects of the LFRMS. The purpose of this is to help ensure that future land-uses in Carmarthenshire over the next seven years are sustainable.

SEA and LFRMS processes so far

N.6. The SEA Screening exercise was carried out to establish whether or not the LFRMS will lead to significant environmental effects. The SEA Screening Report was submitted to the responsible bodies for SEA under the Environmental Assessment of Plans and Programmes (Wales) 2004 (Natural Resources Wales and Cadw) for comment. Following the advice of the statutory bodies, the Local Planning Authority (Carmarthenshire County Council) determined that there is the potential for the SEA process to have a significant influence on the LFRMS through a high-level assessment, which may enable any potential significant environmental effects to be identified and addressed.

N.7. The SEA Scoping Report represented Stage A, 'Setting the Context and Objectives, Establishing the Baseline and Deciding on Scope', of the SEA process for the emerging Strategy and set the scope for the remainder of the process. The key tasks carried out included:

- A1: Identifying other relevant policies, plans and programmes and sustainability objectives.
- A2: Collecting baseline information.

- A3: Identifying environmental problems.
- A4: Developing SEA objectives.

N.8. The consultation on the SEA Scoping Report was held between 11th December 2024 to 15th January 2025. The comments from Natural Resources Wales (NRW) were taken into consideration and the SEA Scoping Report, and this SEA Environmental Report have been updated accordingly.

How was the SEA undertaken?

N.9. The geographical scope of the SEA was driven by the geographical scope of the LFRMS, i.e. the whole of Carmarthenshire. The LFRMS is intended to apply until 2030. This timescale has been reflected in the SEA. The intention of the SEA was to enable to principles of sustainable development to be embedded into the LFRMS from the outset and throughout its duration.

SEA Framework

N.10. A key output of the SEA Scoping Report was the SEA Framework. The SEA Framework is the main assessment tool used during the SEA and comprises six SEA Objectives covering key environmental issues identified during the SEA Scoping stage. These are listed in Table NTS-1. The performance of the LFRMS was tested by appraising each element of the LFRMS for its likely effects against each SEA Objective.

Table NTS-1: SEA Objectives in the SEA Framework

No.	SEA Objective
1	To protect and enhance biodiversity avoiding damage to or loss of designated and undesignated wildlife sites
2	To improve physical and mental health and wellbeing for all and reduce health inequalities
3	To protect and enhance water quality
4	To protect and enhance natural resources, including air and soil
5	To limit and adapt to climate change
6	To protect and enhance the historic environment, landscape and townscape

Reasonable Alternatives

N.11. Carmarthenshire has adopted a catchment-based approach to managing local flood risk, which promotes collaborative working to deliver social, economic, and environmental benefits while the LFRMS is in effect. Public engagement and consultation activities were undertaken during the development of the LFRMS to inform its strategy. The Council considered the following three options when reviewing the existing Flood Management Strategy:

1 Do Nothing: Existing assets and ordinary watercourses are abandoned.

2 Maintain Current Flood Risk Levels: Existing assets and watercourses are maintained to keep pace with climate change so that there is no net increase in flood risk. Existing infrastructure is improved over time and all new development will need to take the effects of climate change into account.

3 Manage and Reduce Local Flood Risk and Coastal Erosion: Take action to reduce the social, economic and environmental impact due to flooding and coastal erosion.

N.12. The SEA has assessed the draft LFRMS and final LFRMS, engaging in discussions with the plan-makers throughout. All options set out in the draft LFRMS were appraised and presented within the Interim SEA Report. The final iteration of the LFRMS has refined the strategy, taking into consideration assessments and recommendations set out in Chapter 7. This SEA Environmental Report has assessed the final version of the LFRMS.

Assessment of the LFRMS

N.13. The contents of the LFRMS that have been subject to assessment within this SEA Environmental Report are structured as follows:

- LFRMS Objectives
- LFRMS Measures
- Actions in the Flood Risk Management Plan (FRMP) set out by the following river basin districts:
  - Gwendraeth Burry River Basin District
  - Llanelli River Basin District
  - Loughor Amman River Basin District
  - Lower Towy River Basin District
  - Teifi River Basin District
  - Upper Towy River Basin District
  - Western River Basin District

Assessment results

N.14. The SEA Environmental Report presents the full and detailed assessment results for the LFRMS. A summary of these results is provided in Table NTS-2.

Table NTS-2: Summary of the effects identified during the SEA of the LFRMS

SEA Objective	Cumulative Effects	
1. Biodiversity	+	Overall, it is considered to be likely that the cumulative effects of the proposed actions are expected to result in long-term positive effects on biodiversity, provided that natural solutions are prioritised where possible, and hard engineering actions are designed to minimise ecological disruption. Ensuring effective monitoring and adaptive management will be critical to maximising biodiversity enhancements while minimising and mitigating potential negative impacts.
2. Health	+	Overall, the proposed actions are expected to result in long term positive effects on physical and mental health by reducing flood risk, enhancing community resilience, and improving environmental quality, provided that socially inclusive engagement, ongoing maintenance, and appropriate consideration of property level measures are prioritised.
3. Water Quality	+	Overall, the proposed actions set out in the LFRMS are expected to result in long-term positive effects on water quality, particularly where nature-based solutions and sustainable drainage are prioritised alongside effective asset maintenance and monitoring.
4. Natural Resources	+	Overall, the proposed actions are expected to result in long-term positive effects on natural resources by reducing soil degradation, enhancing air quality, and promoting sustainable land management practices across the borough, however, it is essential that potential negative effects to natural resources are considered when implementing new potentially invasive actions such as hard engineering and property level flood defences.
5. Climate Change	+	Overall, the proposed actions are expected to have long-term positive effects on climate resilience, particularly when nature-based solutions are integrated alongside strategic infrastructure improvements and hard engineering actions. To effectively limit and adapt to climate

SEA Objective	Cumulative Effects	
		change, it will be essential to ensure the use of maintenance and mitigation measures for hard engineering solutions across the borough.
6. Landscape and Heritage	+	Overall, the proposed actions in the LFRMS are expected to result in long-term positive effects to the historic environment, landscape, and townscape, particularly where nature-based solutions and strategically designed infrastructure improvements are prioritised to enhance flood resilience while respecting Carmarthenshire's cultural heritage.

Monitoring significant effects

N.15. The SEA has identified the likely effects of the LFRMS on SEA Objectives over the short, medium, and long terms. An indication of the certainty of these effects is also provided. However, there is a risk that the sustainability impacts of the LFRMS are different to those anticipated, for example due to unforeseen circumstances. It is therefore an essential component of delivering sustainable development to monitor the impacts of the LFRMS in relation to the predicted effects. Regular monitoring enables the relevant authorities to alter plans as necessary should unexpected negative effects arise or expected positive effects not arise.

N.16. A monitoring framework is presented in the SEA Environmental Report, which sets out a range of indicators to be monitored relevant to the likely significant effects of the LFRMS. In addition to monitoring, the extent to which the LFRMS results in the effects identified in the SEA, the monitoring framework provides an indication of the effects of the LFRMS on the environmental baseline in Carmarthenshire.

1 Introduction

1.1 Background to Carmarthenshire

1.1.1 Carmarthenshire is a county in southwest Wales bordered by Ceredigion to the north, Pembrokeshire to the west, and Swansea and Neath Port Talbot to the east. It is approximately 62 miles west of Cardiff, and spans an area of 2,396km². Carmarthenshire is one of the largest counties in Wales, and its diverse landscape includes rolling hills, valleys, mountainous regions, and extensive natural water bodies, which includes its 90km coastline along Carmarthen Bay. The county is predominantly rural, with its widespread communities facing differing needs and challenges.

1.1.2 Carmarthenshire has a population of 189,117. The demographics vary within the county, with certain communities experiencing elevated deprivation and lower reported health in comparison to other localities in southwest Wales. The main towns include Carmarthen, Llanelli, and Ammanford. Carmarthenshire and its communities have been historically influenced by water and flooding, with 16 reported flooding events since 2020. There are also 28 communities across the county which have been identified to be at high risk of flooding from surface water, ordinary watercourses and rivers. Wales has invested £56.6m of government funding towards key flood risk management strategies to combat this vulnerability, which includes the completion of a flood alleviation scheme in Ammanford, Carmarthenshire.

1.2 Carmarthenshire Local Flood Risk Management Strategy

1.2.1 The new Local Flood Risk Management Strategy (LFMRS) for Carmarthenshire for the period 2024 to 2030 builds on the previous LFRMS published in 2013. The LFRMS focuses on identifying and managing local sources of flood risk and considers management of the risk of flooding and erosion from the sea. This LFRMS encapsulates Carmarthenshire's commitment to managing climate change, promoting community resilience and wellbeing, and enhancing the natural environment with nature-based solutions.

1.2.2 The contents of the LFRMS are as follows:

- Foreword
- Introduction
- How this LFRMS responds to climate change
- Co-ordination
- Roles and Responsibilities for managing flood risk
- Our progress since FRMP-1 (2019-2023)
- Historic Flooding in Carmarthenshire
- Strategic Objectives
- What is the risk of flooding in Carmarthenshire
- Flood risk in your River Basin Districts
- Measures to manage flood risk across Carmarthenshire
- Actions to manage flood risk across Carmarthenshire
- Funding and Prioritisation
- Environmental Assessments

- Monitoring Progress

LFRMS Objectives

1.2.3 The following five strategic objectives provide more detail on what the LFRMS aims to achieve.

Reduce the risk of flooding and coastal erosion to people and communities.

1. Modernise and develop a risk-based, thematic approach to flood and coastal erosion risk management.
2. Become data and information rich to facilitate better decision-making.
3. Champion nature-based solutions and sustainable drainage.
4. Educate, advise and empower our communities to become more resilient.
5. Promote and support community adaptation and partnership working.

1.2.4 The LFRMS also sets out the process from reporting incidents of flooding, to how it will be managed.

1.2.5 Furthermore, the LFRMS outlines ten measures which outline how flood risk is intended to be managed within this strategy:

Measures	
Measure 1	Thematic Incident Management
Measure 2	Maintain a pipeline of capital works business cases
Measure 3	Increase community resilience
Measure 4	Increase public engagement and consultation
Measure 5	Champion innovation and technology
Measure 6	Develop a catchment-based approach to FCERM
Measure 7	Provide expert advice and counsel
Measure 8	Manage FCERM permitting and consenting
Measure 9	Adopt and designate drainage systems and FCERM features
Measure 10	Enforcement

1.3 Purpose of the SEA Environmental Report

1.3.1 The purpose of this Strategic Environmental Assessment (SEA) Environmental Report is to explain the iterative assessment process and how this has shaped the LFRMS from inception to the most recent version. It presents the potential positive and negative effects of the LFRMS, to inform the consultation process.

1.3.2 The SEA demonstrates the transparent and robust decision-making process that has been adopted during the development of the LFRMS. This SEA Environmental Report presents the full assessment of the final LFRMS.

1.4 Consultation

1.4.1 The Consultation Authorities (Natural Resources Wales (NRW) and Cadw) have, statutorily, six weeks to respond to the consultation on the SEA Environmental Report. After receipt of the representations from the consultation authorities, the representations should be taken into consideration by the responsible authority, Carmarthenshire County Council.

2 The SEA Process

2.1 Introduction

2.1.1 SEA is a requirement of several pieces of legislation including the European Directive 2001/42/EC on 'the assessment of the effects of certain plans and programmes on the environment' (The Strategic Environmental Assessment Directive). The SEA Directive is implemented in Wales by the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004[1], and Welsh government has set out guidance for preparing SEAs[2].

2.1.2 The Environmental Assessment (Wales) Regulations 2004 require 'responsible authorities' to assess the likely significant effects on the environment of implementing relevant and qualifying plans and programmes, as defined within the Regulations, through a process called Strategic Environmental Assessment (SEA)[3].

2.1.3 SEA is a systemic process for evaluating the environmental consequences of plans and programmes to ensure that environmental issues are integrated and assessed at the earliest opportunity in the decision- making process.

2.1.4 SEA seeks to ensure that environmental considerations are part of the process of preparing certain plans and programmes. The objectives of the Regulations are to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with the Regulations, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment.

2.1.5 This assessment must also examine the likely significant effects of implementing reasonable alternatives to the plan or programme under consideration.

2.1.6 The Office of the Deputy Prime Minister's (OPDM) Practical Guide subdivides the SEA process into a series of stages[4]. Whilst each stage consists of specific tasks, the intention should be that the process is iterative. **Error! Reference source not found.** presents the key stages in the SEA process and indicates where specific tasks have been addressed in the SEA Scoping Report. The table also demonstrates how each of the SEA stages is linked to the LFRMS. This SEA Environmental Report presents Stage B and C of the SEA process and was consulted upon as required under Stage D.

[1] Environment Agency (2011) Strategic environmental assessment and climate change: guidance for practitioners. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/297039/geho0811buca-e-e.pdf [Date Accessed: 19/12/24]
[2] Gov.wales (2019) Strategic Environmental Assessment in Wales. Available at: strategic-environmental-assessment-sea-in-wales.pdf [Date accessed: 19/12/24]
[3] Legislation.gov.uk (2004) The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004. Available at: The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 [Date accessed: 19/12/24]
[4] Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive. Available at: A Practical Guide to the Strategic Environmental Assessment Directive [Date accessed: 19/12/24]

Table 2-1: Stages in the SEA process

SEA Stage	Section of the Report (where applicable)	Application to the LFRMS
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope		
A1: Identifying other relevant policies, plans and programmes and sustainability objectives	Section 3 of the SEA Scoping Report and Appendix A, Section 2.3 of this SEA Environmental Report.	Stage A corresponds to the scoping stage of the SEA and the findings of this stage are presented in the SEA Scoping Report. The SEA Scoping Report was consulted upon for five weeks with the statutory consultation bodies.
A2: Collecting baseline information	Section 4 of the SEA Scoping Report and Appendix B, Section 2.3 of this SEA Environmental Report.	
A3: Identifying environmental problems	Section 4 of the SEA Scoping Report, Section 2.3 of this SEA Environmental Report.	
A4: Developing SEA objectives	Section 5 of the SEA Scoping Report, Section 2.3 of this SEA Environmental Report.	
A5: Consulting on the scope of the SEA	Section 2.3 of this SEA Environmental Report.	
Stage B: Developing and Refining Options and Assessing Effects		
B1: Testing the plan or programme objectives against the SEA objectives	Chapters 3, 4 and 5 of this SEA Environmental Report.	Stage B is linked to the overall production of the LFRMS. There was a considerable degree of interaction between the plan-making and SEA teams during this stage in the process to enable potential adverse effects of the LFRMS to be avoided/ minimised and potential sustainability benefits maximised.
B2: Developing strategies alternatives		
B3: Predicting the effects of the plan or programmes, including alternatives		
B4: Evaluating the effects of the plan or programme, including alternatives		
B5: Mitigating adverse effects		
B6: Proposing measures to monitor the environmental effects of the plan or programme implementation		
Stage C: Preparing the Environmental Report		
C1: Preparing the Environmental Report	N/A	An SEA Environmental Report and Non-Technical Summary documenting the effects of the LFRMS has been prepared and includes an assessment of the options considered during the development of the Strategy.
Stage D: Consulting on the draft plan or programme and the Environmental Report		
D1: Consulting the public and Consultation Bodies on the draft plan or programme and the Environmental Report	This SEA Environmental Report will be subject to consultation alongside the draft LFRMS.	The SEA Environmental Report has been consulted upon alongside the draft LFRMS.
D2: Assessing significant changes		Following the receipt of consultation feedback, the SEA Environmental Report and the LFRMS may be updated to reflect comments received.
D3: Making decisions and providing information		

SEA Stage	Section of the Report (where applicable)	Application to the LFRMS
Stage E: Monitoring the significant effects of implementing the plan or programme on the environment		
E1: Developing aims and methods for monitoring	Section 7.2 of this SEA Environmental Report.	Monitoring will commence once the LFRMS has been adopted.
E2: Responding to adverse effects		

2.2 SEA Screening

2.2.1 SEA Screening was carried out to establish whether or not the LFRMS will lead to significant environmental effects. The SEA Screening Report set out the context of the LFRMS and identified interactions of the LFRMS with the environment and an explanation of the significance of effects. The SEA Screening Report concluded that the LFRMS would be unlikely to lead to significant environmental effects, and therefore, a full SEA would not be required due to the nature and scale of development likely to be proposed within the Strategy.

2.2.2 The SEA Screening Report was submitted to the responsible Consultation Authorities (NRW, Cadw). The consultation responses received from NRW disagreed with the conclusion of the SEA Screening Report as they viewed the LFRMS to have the potential to have significant effects on the environment.

2.2.3 Following the advice of the Consultation Authorities, the Local Planning Authority (Carmarthenshire County Council) agreed there was the potential for the SEA process to have a significant positive influence on the LFRMS through the consideration of a high-level assessment, which may enable any potential significant environmental effects to be identified and addressed.

2.3 Stage A: SEA Scoping

2.3.1 As described earlier, the SEA process is set out in Table 2-1. This report represents Stage D of this process, the SEA Environmental Report.

Geographical Scope

2.3.2 The geographical scope of the SEA was be driven by the geographical scope of the LFRMS, i.e. the whole of Carmarthenshire County.

Temporal Scope of the SEA

2.3.3 The LFRMS is intended to apply until 2030. This timescale has been reflected in the SEA of the LFRMS. If there are likely to be any sustainability effects of the LFRMS that would last longer than this, these would also be considered at a later date, through an update to this report.

Evidence Gathering, SEA Scoping and Stakeholder Engagement

2.3.4 Stage A of the SEA (Scoping) was undertaken in December 2024 and included evidence gathering and analysis of sustainability issues and opportunities which dovetailed into the LFRMS evidence. The draft SEA Scoping Report for the SEA of the LFRMS was one of the first stages in engagement and collaboration for the LFRMS. Consultation on the SEA Scoping Report was undertaken between 11th December 2024 to January 15th 2025.

2.3.5 Stage A, 'Setting the Context and Objectives, Establishing the Baseline and Deciding on Scope' included the following five tasks:

- A1: Identifying other relevant policies, plans and programmes and SEA Objectives;
- Collecting baseline information;
- A3: Identifying sustainability issues and opportunities;
- A4: Developing the SEA Framework; and
- A5: Consulting on the scope of SEA.

Review of relevant plans, programmes and strategies

2.3.6 Box 1 below stipulates the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 requirements for this stage of the process.

Box 1: Environmental Assessment of Plans and Programmes (Wales) Regulations requirements for the review of plans programmes and environmental protection objectives

> *"An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes"* (Schedule 2 (1))
>
> *"The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation"* (Schedule 2 (5))

2.3.7 A review of plans, programmes and strategies that may affect the preparation of the Strategy was undertaken in order to contribute to the development of both the SEA and the Strategy. This included:

- Identification of any external social, environmental or economic objectives, indicators or targets that should be reflected in the SEA process.
- Identification of any baseline data relevant to the SEA.
- Identification of any external factors that might influence the preparation of the document, for example sustainability issues.
- Identification of any external objectives or aims that would contribute positively to the development of the Strategy.
- Determining whether there are clear potential conflicts or challenges between other identified plans, programmes or sustainability objectives and the emerging Strategy.

2.3.8 The review included documents prepared at international, national, regional and local scale. A brief summary of the documents reviewed, and the main findings are summarised below in **Error! Reference source not found.**.

Table 2.1: Summary of the PPP review

Scale	Summary
International	A review was undertaken of key International Conventions that could potentially influence the development of the LFRMS and the SEA.
UK	A review was also undertaken of relevant publications from organisations including, for example, Department for Transport (DfT), the Department of Business, Energy and Industrial Strategy (DBEIS), and the Department for Environment, Food and Rural Affairs (Defra). These publications outline the action plans and strategies across a breadth of topic areas for example The Air Quality Strategy for England, Scotland, Wales and Northern Ireland and the UK Integrated National Energy and Climate Plan (NECP) as well as the Committee on Climate Change (2021) UK Climate Change Risk Independent Assessment: Technical Report (particularly the 'Summary for Wales'). The objectives of these plans, as well as some of the challenges they raise need to be taken on board, as appropriate. Any previous relevant European Directives are transposed into national regulations.
National	A review was undertaken of plans produced at the Wales national level. Many of these are produced by Welsh Government and specifically address strategic issues such as the economy; transport; health; safety; sustainable communities; housing; employment; and environmental protection.
Regional	In some circumstances, there are region-specific plans and programmes that have been prepared. This includes and Energy Strategy, Regional Economic Framework and Economic Delivery Plan. These documents set out locally specific aims and priorities to promote growth and sustainable measures in South West Wales.
Local	A review was undertaken of local plans produced by Carmarthenshire County Council. These address strategic issues such as a transformation strategy to modernise and drive significant change across the county, equality, social care, poverty, Welsh language promotion, and waste. These programmes aim to develop Carmarthenshire into a modern, healthy, and equal county with fewer local disparities.

Establishing the baseline

2.3.9 Box 2 defines the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 requirements for this element of the process.

Box 2: SEA Regulations Requirements for baseline and the identification of key sustainability issues

"Relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme" (Schedule 2 (2))

"The environmental characteristics of the areas likely to be significantly affected" (Schedule 2 (3))

"Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds (a) and the Habitats Directive" (Schedule 2 (4))

2.3.10 Characterising the environmental and sustainability baseline, issues and context is an essential part of developing the SEA Framework. It comprises the following key elements:

- Characterising the current state of the environment of the site and the surrounding areas including social and economic aspects; and
- Using this information to identify existing problems and opportunities that could be considered in the Strategy.

2.3.11 The environmental, social and economic baseline was characterised through the following methods:

- Review of relevant local, regional and national plans, programmes and strategies; and
- Data research based around a series of baseline indicators developed from the SEA topics, SEA guidance, previous consultation recommendations from other SEAs and the data available for the county.

2.3.12 The collation of baseline data also enabled the identification of key sustainability issues and opportunities affecting the Strategy area. Sustainability issues and opportunities identified in the baseline review are detailed in Table 2.2.

Table 2.2: Key sustainability issues and opportunities for LFRMS

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
Biodiversity, Flora and Fauna	• Key pressures to Carmarthenshire's biodiversity include water and air pollution capable of adversely affecting biodiversity; changes to natural processes such as flash flooding with the potential to harm aquatic ecosystems; changes to microclimate which have the potential to alter the performance of some species of plants and animals; exploitation of marine and coastal environments; habitat loss and fragmentation and pressure from development[5]. Opportunities such as expanding and connecting protected areas through initiatives such as Resilient ecological networks can promote species movement and habitat resilience to these threats. • NRW is seeking to work in partnership with the environmental sector, land owners, and communities in Wales to deliver an action plan designed to improve current approaches to monitoring the health of protected sites in the future, highlighting a key opportunity to accurately improve Carmarthenshire's nationally protected sites. • There are opportunities for the condition of biodiversity assets to be improved and opportunities should be sought to deliver biodiversity enhancements where possible, for example by targeting the issues that are driving decline and supporting recovery. • Flooding is a key pressure for Carmarthenshire's biodiversity. There is a key opportunity to mitigate this pressure in the LFRMS through the utilisation of natural flood management and sustainable land management strategies, both of which share principles of ecosystem stewardship, resilience building, and sustainability. Within these strategies, methods including Green and Blue infrastructure, saltmarsh and peatland restoration, and soil and land management can contribute to enhanced ecological connectivity and resilience while improving flood management within Carmarthenshire. • Coastal squeeze presents itself as a key issue in Carmarthenshire, with Carmarthen Bay expected to lose 93 hectares of Saltmarsh by 2155. Arising from

[5] Carmarthenshire County Council – The State of Nature in Carmarthenshire (2024). Available at: https://www.carmarthenshire.gov.wales/council-services/planning/biodiversity/the-state-of-nature-in-carmarthenshire/ [Accessed: 26.11.24]

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	anthropogenic structures or actions, coastal squeeze prevents the landward progression of habitats in response to sea level rise, causing the deterioration or loss of coastal and intertidal features. • In order to accommodate urban and industrial developments, some watercourses within Carmarthenshire have been confined or re-routed (most notably the Dafen and Lliedi rivers in Llanelli). Physical modifications are a primary pressure to ecology within watercourses, and it is predicted to continue and even increase into the future. • A key opportunity for the enhancement of biodiversity in Carmarthenshire can be seen in the 'Greening Carmarthenshire' project. With the aim to enhance the green and blue infrastructure network found throughout both the urban and rural landscapes of the county, this project seeks to promote the use of Nature based solutions to not only promote the conservation of biodiversity but also make the county a healthier place to live, work, and play. • Non-native, invasive plant species on watercourses present a key risk to biodiversity and flooding in Carmarthenshire. Aquatic species such as Parrot's Feather and New Zealand Pygmy weed have the ability to rapidly dominate a waterbody, contributing to the crowding out of native species and the destabilisation of riverbanks. This potentially increases the risk of flooding and harm to local biodiversity • There are many high flood risk receptors within Carmarthenshire and its designated sites. With 8942 SSSI, 8114 Special Areas of Conservation (SAC), and 2009 Special Protection Areas (SPA) high risk flood receptors, flooding is a key pressure for Carmarthenshire's biodiversity. There is an opportunity for the LFRMS to mitigate this pressure on biodiversity through the management of these protected sites and their flood risk receptors. • There is a key opportunity to manage flooding in the LFRMS through the utilisation of nature-based solutions and sustainable land management strategies, both of which share principles of ecosystem stewardship, resilience building, and sustainability. Within these strategies, methods including Green and Blue infrastructure, peatland restoration, and soil and land management can contribute to enhanced ecological connectivity and resilience while improving flood management within Carmarthenshire. • The Carmarthenshire Local Nature Recovery Plan emphasises the importance of looking beyond the county's internationally and nationally designated sites to focus on the wider natural environment. This approach presents an opportunity to adopt a holistic strategy for enhancing biodiversity. By embedding biodiversity considerations into the LFRMS, addressing key pressures on species and habitats, and implementing a robust framework of governance and support, the plan provides a clear pathway for delivering meaningful and sustainable action. • The 'Green and Blue Infrastructure Assessment' within the Revised 2018-2030 Local Development Plan for Carmarthenshire highlights the importance of incorporating multifunctional Green and Blue Infrastructure (GBI) into development proposals across the county. The assessment calls for public bodies to prioritise planning for Green and Blue Infrastructure that not only supports the creation of Resilient Ecological Networks (RENs) but also delivers tangible benefits for people by improving biodiversity and ecosystem services. The LFRMS presents a key opportunity to align with these principles by integrating Green and Blue

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	Infrastructure into flood management strategies. Features such as wetlands, sustainable drainage systems (SuDS), and natural floodplains can reduce flood risk while simultaneously enhancing biodiversity, improving water quality, and building ecological resilience. • A Forest Resource Plan (FRP) is a key management document for the Welsh Government's Woodland Estate (WGWE). These plans outline proposals for the future management of woodlands, aligning with current policies and practices. To meet the standards established by the UK Forestry Standard (UKFS) and the UK Woodland Assurance Standard (UKWAS) for water management and flood risk, future iterations of Forest Resource Plans will be developed. These updated plans present an opportunity to enhance the resilience of ecosystems in Carmarthenshire while designing and managing forests to contribute to flood risk reduction. A Carmarthenshire Local Nature Recovery Plan (2020-2030) is being developed and undertaken to help deliver the commitments of the UN Convention on Biological Diversity and the EU Biodiversity Strategy to halt the decline of the local biodiversity and then reverse that decline[6].
Population	• The expected continuation of the aging population in Carmarthenshire could place increased pressure on healthcare, social services, and retirement-related infrastructure, while reducing the workforce population. • The decline of Welsh speakers poses risks for cultural preservation, efforts to revitalise this language presents itself as a key opportunity. • The high reliance on private cars could result in elevated carbon emissions and thus environmental concerns, prompting the opportunity to ensure the maintenance of access to public transport and its infrastructure. • The LFRMS should seek to protect the local economy by maximising the resilience of services, sustainable transport infrastructure and accessibility networks. • Densely populated residential areas and key roads such as Bridge Street and Hillfield Villas are among the areas at most risk of coastal and river flooding. The extensive car parks, paved, and heavily built-up areas across the county also increase the risk of surface water flooding. A key opportunity to reduce this risk is presented in the 'Green and Blue Infrastructure Assessment' within the Revised 2018-2030 Local Development Plan for Carmarthenshire. This emphasises the importance of maximising opportunities to integrate multifunctional GBI within development proposals throughout the county[35], enhancing flood and water management within residential, built environments. The use of sustainable urban drainage systems is also an opportunity to mitigate the risk to key urban flood receptors. • Ammanford's flood risk management scheme has reduced flood risk to key transport routes, Ammanford railway station, and 235 properties, highlighting key opportunities for the LFRMS to improve flood management in Carmarthenshire. • With the number of properties at high risk of flooding in Carmarthenshire and coastal erosion projected to increase, addressing climate change is critical to the county's future flood risk management. Combined with population growth and the rising demand for residential infrastructure, there is an opportunity for the LFRMS

[6] Carmarthenshire County Council – Carmarthenshire Nature Partnership (2024). Available at: https://www.carmarthenshire.gov.wales/home/council-services/planning/biodiversity/carmarthenshire-nature-partnership/ [Accessed: 27.11.24]

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	to integrate flood resilience into new housing developments while adapting existing infrastructure. This could facilitate the enhanced management of increased water levels and flooding events.
Human Health	• The limited access to public transport and rurality of the county may present an issue for access to NHS services, particularly due to the aging population. The LFRMS should ensure that accessibility is improved through flood risk management measures. • The LFRMS could enhance green open spaces as part of flood risk measures, to promote health and wellbeing. • The variation of deprivation throughout the county could reflect a combination of key issues surrounding historical, economic, geographic, and social factors that have shaped the development and resources of the county over time, highlighting the opportunity to target and develop key factors of concern within each locality. The deprived localities of Carmarthenshire could also be disproportionately affected by flooding and risk of flooding, and the LFRMS should seek to reduce potential geographical inequalities which may contribute to this flood risk. • There may be an opportunity for the combination of flood risk management measures and investment in pedestrian footpaths and cycling infrastructure, which can lower emissions, promote healthier lifestyles, and reduce car dependency. • In terms of 'Access to services', Carmarthenshire is home to the most deprived small area in Wales (Cynwyl Gaeo). The LFRMS should seek to protect and enhance accessibility wherever possible. • The ageing population in Carmarthenshire could struggle with some flood risk management measures such as those providing alerts. If systems aren't developed to meet the needs of the older population, instances of isolation and reduced access to essential services may increase. • The Carmarthenshire Public Services Board (PSB) have produced a Well-being plan to improve the economic, social, environmental, and cultural wellbeing of the county from 2023-2028. Presenting a key opportunity to improve health and resilience within Carmarthenshire, the plan follows objectives including the reduction of health inequalities and responding to climate and nature emergencies, such as flooding events • The dedication to implementing new green and blue infrastructure throughout Carmarthenshire demonstrated in the revised 'Local Development Plan 2018 – 2033' creates an opportunity for improved nature contact within urban environments. Through enhancing green and blue spaces and their accessibility, the well-being of communities can benefit whilst the area is adapted to more efficient and sustainable flood management. • The British Red Cross research 'Every time it Rains' explores the experiences of communities impacted most severely by flooding, and highlights the areas in need for improvements in policy and practice that ensures people are prepared for, and can recover more quickly from flooding. This presents a key opportunity to improve the health and wellbeing of Carmarthenshire through improving how the county manages flooding.

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
Soil	• The predominantly acid loamy, clayey, and sandy soils may limit agricultural productivity and require specific land management practices and should be considered when developing flood risk management measures. • Slowly permeable soils around Carmarthen and the east increase the likelihood of surface water runoff and flooding during heavy rainfall. The low-lying areas of land are also susceptible to flooding, posing risks to both agricultural and developed land. • The high frequency of active quarries may contribute to environmental degradation, biodiversity loss, and localised flooding risks. • A key opportunity is presented in the promotion of sustainable agricultural practices, such as contouring, to enhance soil stability and runoff. • A key opportunity for the strengthening of flood defences in vulnerable low-lying coastal areas, such as permeable surfaces and encouraging run-off. • Due to their ties to flood risk, the amount of coal tips in Carmarthenshire presents a key issue to flood management in the county. Methods to manage these sites to reduce their impact on flooding is a key opportunity for the LFRMS. • The Carmarthenshire Bogs Project focuses on five areas of lowland bog on areas of common land near Brechfa and Llanfynydd. Helping to revitalise and maintain these peatland areas, the project offers an opportunity to mitigate climate change, as healthy bogs can store carbon from the atmosphere and are one of the largest known carbon stores. Healthy peatlands can also absorb and hold large quantities of water, reducing surface runoff and offering an opportunity for the LFRMS to mitigate flood risk. The National Peatland Restoration Programme managed by Natural Resources Wales aids in the regeneration of peatlands in Carmarthenshire, with the aim to restore 3,000 acres of peatland across Wales and seeking to improve water management, carbon storage, and biodiversity across the country, benefitting Carmarthenshire's adaptation to future flood risk. • There is a key opportunity to reduce flood risk and soil erosion in the LFRMS seen in nature-based solutions. These sustainable, less invasive strategies can also provide wider benefits such as reducing water pollution and increasing resilience during droughts. Methods such as sustainable and regenerative agricultural land management within catchment areas have a key role in reducing soil surface run-off and erosion associated with degraded soil structure from intensive practices. • A 'Sustainable Farming Scheme' is commencing in Wales in 2026. This scheme is dedicated to making it easier for farmers to continue producing high quality food sustainably and meet commitments to nature, the environment, and climate change, which is a key opportunity to improve flood management, reduce flood risk, and reduce contributions to climate change from agricultural land in Carmarthenshire.
Water	• The frequency of flooding presents a key risk in erosion of topsoil, particularly in agricultural areas. This can reduce agricultural productivity in the counties rural landscape, impact aquatic ecosystems and water quality with increased sedimentation in water bodies and increase reliance on artificial soil management. • Flooding can lead to contamination of water sources with pollutants such as sewage, agricultural runoff, and chemicals.

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	• Rising costs of flood management, infrastructure repair, and compensation for affected communities can place strain on public resources and inflict long-term stress on local businesses and residents. • The current investment in flood risk infrastructure is producing resilience to withstand future risks. • Flood management and resilience projects can boost the local economy and create employment. • Communities in the County have access to information and resources for flood risk, and to prepare for and respond to flooding, which present a key opportunity for future community resistance to flooding. • Carmarthenshire's bounty of natural water resources provides the opportunity to harness renewable energy from water. A key opportunity could be found in the installation of hydroelectric power projects and the integration of water-based renewable energy into the local energy network. • The abundance of waterbodies presents a key opportunity for tourism and eco-tourism centred around water-related landscapes and activities. • The current investment in flood risk infrastructure is providing resilience to withstand present risks. However, with flooding events predicted to become more severe into the future, a further understanding of how the county may be affected and the investment requirements necessary to mitigate this are required to effectively prepare for the future risks of flooding in Carmarthenshire. • The failure to meet phosphorus and water quality targets in the River Teifi and Cleddau highlights a significant opportunity for the LFRMS to enhance the management of protected rivers in Carmarthenshire, with the aim of improving ecological conditions across the county. Additionally, the '4 Rivers for LIFE' project presents a valuable opportunity to support the conservation of these protected water bodies by rehabilitating and restoring the natural processes, features, and habitats of the River Teifi and Cleddau. Beyond this, the LFRMS also has the potential to focus on rehabilitating and restoring non-protected rivers in Carmarthenshire, contributing to more sustainable water management practices and reducing flood risks throughout the region. • A key factor contributing to the failure of waterbodies in Wales under the Water Framework Directive (WFD) is the physical modification of watercourses, which has led to their disconnection from floodplains and riparian corridors. Addressing this issue could be achieved by collaborating with ongoing projects and delivery mechanisms, such as Area Statements and Opportunity Catchments, to develop and implement nature-based solutions that tackle the challenges currently affecting Carmarthenshire. The focus of Opportunity Catchments is to maximise the benefits for waterbodies and wellbeing, and this collaboration can offer wide benefits relating to flood risk, climate change, wellbeing, and biodiversity, and offer the opportunity for the LFRMS to mitigate any negative effects of future physical modifications on the natural environment.
Air	• Air quality in Carmarthenshire is generally very good, reflective of its largely rural nature and high-quality natural environment. However, there are three Air Quality Management Areas (AQMAs) in Carmarthenshire.

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	• Wales has some of the worst air quality in the UK, which is surprising given its low population density and relatively small cities. • The LFRMS should seek to ensure that air quality is not worsened through the creation of flood management measures and should seek the improve air quality through the creation of nature-based solutions and the protection of sustainable transport infrastructure. • A key opportunity for increasing climate resilience in urban areas in Carmarthenshire is seen in the implementation and development of green and blue infrastructure. For example, increasing the surface area of green cover can increase the water retention capacity of the environment and mitigate against both flooding and droughts, as well as wider environmental benefits. • Nature based solutions are a key opportunity for the LFRMS to reduce flood risk, while also contributing to the mitigation of climate change. For example, peatland restoration can enhance carbon capture within Carmarthenshire.
Climatic Factors	• The landscape is also suited for solar and hydroelectric power, and investments in this renewable infrastructure can not only help meet local energy demands but also support Wales's transition to net zero emissions. • The reduction of industrial, commercial, and domestic energy use since 2005 indicates positive progress towards energy efficiency, which presents an opportunity to further promote energy saving technologies and sustainable practices in these sectors. • The reliance on high-emission industries, particularly iron and steel production and gas-powered energy supplies poses a significant risk to achieving net zero targets. Without substantial investment in cleaner technology and renewable energy, Carmarthenshire risks falling behind its climate commitments. • A key opportunity for increasing climate resilience in urban areas in Carmarthenshire is seen in the implementation and development of green and blue infrastructure. For example, increasing the surface area of green cover can increase the water retention capacity of the environment and mitigate against both flooding and droughts, as well as wider environmental benefits. • Nature based solutions are a key opportunity for the LFRMS to reduce flood risk, while also contributing to the mitigation of climate change. For example, peatland restoration can enhance carbon capture within Carmarthenshire.
Cultural Heritage and Archaeology	• Flooding presents a key risk to the integrity and conservation of Carmarthenshire's abundance of listed buildings, Parks & Gardens, Scheduled Monuments, and Conservation Areas, which form an integral part of the historic and cultural fabric of Wales. Increasing investment to and the management of water bodies and flooding throughout Wales presents a key opportunity to conserve the cultural heritage of Carmarthenshire. • The Historic Environment Group (HEG) is a high-level forum designed to include a strategic overview of issues and opportunities in the historic environment in Wales, and to promote common approaches to their protection. This is a key opportunity for the present and future protection of Heritage assets from flooding in Carmarthenshire, and the LFRMS could collaborate with the HEG to enhance the

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	understanding of environmental threats to heritage to assets in the county and mitigate these risks. • The Royal Commission on the Ancient and Historical Monuments of Wales has mapped the historical boundaries of Wales to make them freely available. There is an opportunity to commission local refinement of the spatial mapping to the Carmarthenshire scale presented here, which can inform the LFRMS on key areas at risk of flooding and can then be addressed within the strategy.
Landscape	• The scenic and high-quality landscape within Carmarthenshire presents opportunities to develop eco-tourism, local identity, and branding surrounding its valuable natural features. • Opportunities to address the landscape challenges of climate change arise in climate resilient flood risk strategies including support for local species, habitat restoration projects, and wildlife corridors, which can all aid in how the landscape of Carmarthenshire adapts to changes in climate. • The loss of tranquil areas within Carmarthenshire and Wales presents a key risk to the county's historical landscape. The protection and maintenance of those that remain can develop the historical natural landscape while offering an opportunity for the LFRMS to implement nature-based flood management techniques within these areas. • The conservation and enhancement of the landscape of the Bannau Brycheiniog National Park can offer a wide range of environmental benefits while also contributing to the reduction of flood risk in Carmarthenshire. Nature based solutions such as reforestation and woodland management can enhance biodiversity and improve air quality, while also offering flood risk reduction through root systems aiding in the stabilisation of soil. This support can also develop resilient ecological networks at a landscape scale, enabling landscape adaptation to climate change.

SEA Framework

2.3.13 The SEA Framework underpins the assessment methodology and comprises a series of Environmental Objectives (SEA Objectives) (covering environmental and some social issues) that are used to test the performance of the plan being assessed. Whilst the SEA Directive does not require the use of SEA Objectives, they are a recognised tool for undertaking the assessment and are aspirations/goals that an authority/organisation should work towards achieving. The SEA Objectives provide a means of appraising the performance of the Strategy in a consistent manner enabling its potential effects to be identified and mitigated where possible. The SEA Objectives are separate from the Strategy Objectives, although there may be some overlaps between them. To help measure the performance of the Strategy components against the SEA Objectives, it is beneficial if they are supported by a series of indicators and targets, which will be developed and reviewed as the SEA process progresses. The following section provides further details about the development of the SEA Framework.

2.3.14 The SEA Objectives have been developed using the review of other relevant plans, programmes and strategies, the baseline data and the key issues and opportunities. **Error! Reference source not**

found..3 presents the SEA Framework that was used in the assessment of the Carmarthenshire Local Flood Risk Management Strategy. Each of the SEA Objectives is supported by a series of guide questions to add further clarity and to assist the assessment process.

Table 2.3: The SEA Framework

SEA Objective	Decision aiding questions Will the Strategy…?
1. To protect and enhance biodiversity avoiding damage to or loss of designated and undesignated wildlife sites *(SEA Topics: biodiversity, fauna and flora)*	Protect and enhance designated sites of nature conservation importance? Protect and enhance non-designated sites? Have a likely have a significant effect on protected sites and protected species? Enhance local biodiversity and geodiversity including the enhancement of networks across the region? Provide opportunities for people to access wildlife spaces? Minimise the environmental footprint of flood risk infrastructure? Minimise the effect of modifications to watercourses on biodiversity? Consider the impact of non-native invasive species as a risk to biodiversity and flooding? Deliver nature-based solutions such as RENs to respond to environmental and climate emergencies and create more natural hydrological flow regimes? Prioritise the use of multifunctional Green and Blue Infrastructure in development proposals? Incorporate FRPs to enhance the resilience of ecosystems and contribute to the reduction of flood risk? Minimise the potential effect of coastal squeeze including on the Marine Protected Area Network?
2. To improve physical and mental health and wellbeing for all and reduce health inequalities *(SEA Topics: population, human health)*	Protect and enhance public accessibility to open space? Create, maintain, and enhance green and blue infrastructure networks? Protect and enhance key urban flood risk receptors and infrastructure? Prioritise the use of nature-based solutions and multifunctional Green and Blue Infrastructure to improve nature contact within urban environments? Reduce geographical inequalities amongst different groups in the community? Maintain the connectivity of communities? Reduce the fear of flood risk and stress caused by flooding events? Protect the local economy by maximising the resilience of services, sustainable transport infrastructure and accessibility networks? Encourage sustainable tourism through the creation of attractive multifunctional spaces for flood storage?

SEA Objective	Decision aiding questions Will the Strategy…?
	Ensure that flood risk management measures reflect local population characteristics including an ageing population? Ensure that any measures of relevance are reflect the need to promote the Welsh Language? Reflect the Carmarthenshire PSB Well-being Plan to improve county-wide health, resilience, and ability to respond to climate emergencies? Integrate flood and coastal resilience into new residential infrastructure as flood risk and the demand for housing increases? Facilitate improvements to the policy and practice of flood management to ensure people are prepared for and can recover more quickly from flooding?
3. To protect and enhance water quality *(SEA Topic: water)*	Affect the quality of waterbodies and groundwater? Limit pollution of water resources? Contribute to the sustainable use of water? Seek to understand and adapt to how flood risk is predicted to increase into the future? Enhance the water quality, management, and protection of SAC rivers? Seek to meet phosphorous targets in waterbodies? Collaborate with ongoing projects to mitigate the negative effects of physical modifications to waterbodies. Utilise nature based solutions to combat environmental emergencies such as flooding and drought? Seek to integrate nature based solutions and SuDS into the design of new developments within catchments?
4. To protect and enhance natural resources, including air and soil *(SEA Topics: soil, air, material assets)*	Contribute to the reduction of erosion including through the promotion of sustainable agricultural practices? Limit the pollution of soils? Limit the loss of soils through construction activities? Limit the loss of soils through flood risk? Ensure that air quality is not worsened by the development of flood risk management infrastructure? Improve air and soil quality through the creation of nature-based solutions to flood risk while offering wider benefits such as resilience during droughts? Consider the effect of active quarries on localised flood risk? Enhance the management of coal tips to reduce their impact on flooding? Enhance soil management practices to reduce flood risk? Seek to revitalise and maintain bogs and peatland?

SEA Objective	Decision aiding questions Will the Strategy…?
	Seek to enhance the sustainable management of agricultural land? Utilise SuDS to improve flood management and protect natural resources?
5. To limit and adapt to climate change *(SEA Topic: climatic factors)*	Help the water network adapt to the predicted effects of climate change including risk of flooding and more variable weather? Contribute to the creation of renewable energy generation from water? Utilise Green and Blue Infrastructure to enhance climate resilience in urban areas? Incorporate nature-based solutions to contribute to the mitigation of climate change? Seek to develop understanding of how climate change may impact Carmarthenshire into the future?
6. To protect and enhance the historic environment, landscape and townscape *(SEA Topics: cultural heritage, including architectural and archaeological heritage and landscape)*	Conserve, protect and enhance the historic environment, heritage assets and their settings? Seek to collaborate with the HEG to enhance the understanding of environmental threats to heritage assets and mitigate these risks? Seek to locally refine the spatial mapping of Historical monuments in Wales to enhance the identification the key historical sites at risk of flooding in Carmarthenshire? Affect protected landscape features? Maintain areas of tranquillity? Protect and enhance the landscape and townscape character of the area? Conserve and enhance the landscape of the Bannau Brycheiniog National Park?

Scoping Consultation

2.3.15 The SEA Scoping Report was issued to Cadw and NRW for their comments on between 11th December 2024 to 15th January 2025. Their comments were reviewed, and the SEA Scoping Report was updated (see Appendix B). The updates to the SEA Scoping Report have been reflected in this SEA Environmental Report.

3 Stage B: Methodology

3.1.1 The approach has included the following steps (refer to Table 2-1 and the boxes below):

- B1: Testing the strategy objectives against the SEA objectives;
- B2: Developing the strategy options;
- B3: Predicting the effects (including cumulative and secondary effects) of strategy options and alternatives;
- B4: Evaluating the effects (including cumulative and secondary effects) of strategy options and alternatives;
- B5: Consider ways of mitigating negative effects and maximising beneficial effects; and
- B6: Proposing measures to monitor the significant effects of the strategy's implementation.

Task B1: Testing the strategy objectives against the SEA Objectives

The Objectives of the LFRMS should be tested for the compatibility with, and likely effects on, each SEA Objective and identifying other options or opportunities to refine options.

Task B2: Developing the options

Task B2 involves identifying and considering various options that would help to contribute towards the SEA Objectives. This can be seen as being the identification and consideration of preferred options, and alternatives to these options, in the LFRMS. In light of the likely effects of each option, as identified and described through the iterative SEA process, the plan maker is equipped to refine and select options for the Plan so as to achieve sustainable development.

Task B3&4: Predicting and evaluating the effects of the Plan

Tasks B3 and B4 of the SEA process involve helping to develop the LFRMS by predicting and evaluating its effects on the economic, environmental and social sustainability of the strategy area. Government guidance states that the potential effects should be quantified, or a judgement made where this is not possible.

Sustainability effects are predicated, with a focus on their likelihood, scale, duration, timing and whether they are positive or adverse. These predictions are then evaluated using professional judgement in order to identify cumulative, synergistic and secondary effects, as well as conflicts and limitations of strategy policies.

Task B5: Considering ways of mitigating negative effects and maximising beneficial effects

Mitigation involves putting in place measures to prevent, reduce or offset any identified adverse sustainability effects. Mitigation measures may also include recommendations for enhancing positive effects. The first priority should, however, be avoidance of adverse effects. Only when all alternatives that might avoid an adverse effect have been exhausted, should mitigation be sought to reduce the harmful effect.

Task B6: Proposing measures to monitor the significant effects of the Plan

A monitoring system should be prepared and proposed that, if adopted and followed, would enable the plan maker to ensure that the LFRMS is resulting in the predicted effects and that avoidance, mitigation or compensation measures that were adopted are working as planned. This provides the opportunity to alter measures to make them more effective.

3.1.2 The Vision, priorities and objectives of the LFRMS were tested for their compatibility with the SEA Framework in order to identify potential gaps or conflicts (B1). The Actions and Locality Proposals were assessed in detail (B3 and B4) for their potential effects on each SEA Objective.

3.1.3 Assessments in the SEA follow an integrated approach. It primarily relies on the SEA Framework, which sets out six SEA Objectives. The assessments predict and evaluate the likely minor and significant positive and negative (including direct, indirect, secondary and cumulative) effects on each SEA Objective.

3.1.4 Task B1 of the SEA process is 'Testing the plan objectives against the SEA Objectives'. As part of this, the LFRMS Vision and Objectives should be tested for the compatibility with, and likely effects on, each SEA Objective. The compatibility methodology symbols are set out below.

Table 3-1: Symbology for compatibility

Compatible	✓
Incompatible	✗
Neutral	O
Uncertain	?

3.1.5 The assessment for tasks B2-B6 are presented in assessment matrices. The matrix is an established method for clearly analysing the performance of a proposal and helps meet the requirements of the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 requirements by ensuring that the following elements are considered. This enabled significant effects to be identified:

- Effect – whether the effect will be positive, negative or neutral when assessed against the SEA Objectives.
- Temporal scale – whether the effect will be short-term (within 5 years), occur in the medium term (5 – 10 years) or occur in the long-term (10 years +).
- Spatial scale – where the effects will occur within the area. Any transboundary effects outside of the study area would also be considered.
- Permanency – whether effects will be permanent or temporary.
- Level of certainty – the level of certainty in the prediction will be classified as low, medium or high.
- Cumulative and synergistic effects.

3.1.6 Where negative effects are identified, measures have been proposed to offset, avoid or otherwise mitigate for the impact. In addition, measures which may further enhance benefits were also identified, as appropriate.

3.1.7 The scoring used for the appraisal of a proposal is defined in Table 3.1.

Table 3.1: Notations used in the SEA assessment

Impact	Description	Symbol
Major Positive Impact	The proposal contributes strongly to the achievement of the SEA Objective.	++
Positive Impact	The proposal contributes partially to the achievement of the SEA Objective.	+
No Impact/ Neutral	There is no clear relationship between the proposal and/or the achievement of the SEA Objective or the relationship is negligible.	0
Negative Impact	The proposal partially detracts from the achievement of some elements of the SEA Objective.	-
Major Negative Impact	The proposal strongly detracts from the achievement of all elements of the SEA Objective.	--
Uncertain impact – more information required	It is not possible to determine the nature of the impact as there may be too many external factors that would influence the appraisal, or the impact may depend heavily upon implementation at the local level.	?
Positive and Negative Impacts	The proposal has a combination of both positive and negative contributions to the achievement of the SEA Objective.	+/-

3.2 Consideration of reasonable alternatives

3.2.1 A key tenet of SEA is the consideration of reasonable alternatives, as the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 states:

Part 2 (12):

(2) The report must identify, describe and evaluate the likely significant effects on the environment of-

a) implementing the plan or programme; and
b) reasonable alternatives, taking into account the objectives and the geographical scope of the plan or programme.

3.2.2 In practice, the requirements stated above necessitate:

- That the SEA describes the reasonable alternatives to the LFRMS and predicts and evaluates their likely sustainability impacts to the same level of detail as all options being appraised;
- That the SEA outlines the reasons for which reasonable alternatives were considered to be 'reasonable' whilst other options were not; and
- That the SEA provides a justification for the selection of the preferred approach in light of the alternatives dealt with.

3.2.3 Determining if an alternative is reasonable is typically an evaluative and qualitative assessment for the planning authority. SEA Guidance states that "*only reasonable, realistic and relevant alternatives need to be put forward*".

The National Strategy for Flood and Coastal Erosion Risk Management (FCERM)

3.2.4 The national strategy for FCERM sets out the policy and legislative context to FCERM activities in Wales. Within this, the Flood Risk Regulations 2009 set out a framework for effective management of flood risk in England and Wales. The Flood and Water Management Act 2010 requires all 22 Lead Local Flood Authorities (LLFAs) in Wales to produce a LFRMS which must align with the national strategy.

Vision, Priorities and Objectives

3.2.5 The Vision and Strategic Priorities from the previous national strategy for FCERM (2011) were used as a starting point for the new strategy, though the current strategy has been updated with a longer term, strategic view, recognising the nature of flood and coastal erosion risk with respect to the challenges of climate change[7]. Recommendations made by the Wales Audit Office (WAO) in its 2016 report on Coastal Flood and Erosion Risk Management in Wales, the Public Accounts Committee's 2017 report on Coastal flood and erosion risk management in Wales, as well as the 2014 Wales Coastal Flooding Review were also taken into account during the development of the strategies objectives.

3.2.6 Key changes to this National Strategy include the clarification of roles and responsibilities around flood and coastal erosion, the promotion of natural measures and catchment approaches, new objectives on improving our understanding and preventing exposure to risk, highlighting the importance of good information and effective planning, and direction on how our investment is prioritised, supported by new FCERM Business Case Guidance[7].

Iteration of the LFRMS

3.2.7 As the preparation of the LFRMS is an iterative process, the SEA has assessed the draft LFRMS and final LFRMS, engaging in discussions with the plan-makers. All options set out in the draft LFRMS were appraised within the SEA Environmental Report. The final iteration of the LFRMS has refined the options, taking into consideration assessments and recommendations set out in Chapter 7. This final iteration of the LFRMS has subsequently assessed the final version of the LFRMS and the preferred options.

[7] Gov.wales (2020) The National Strategy for Flood and Coastal Erosion Risk Management in Wales. Available at: https://www.gov.wales/sites/default/files/publications/2021-03/the-national-strategy-for-flood-and-coastal-erosion-risk-management-in-wales.pdf [Accessed: 19/12/24]

4 Compatibility Assessments

4.1 Strategic Objectives

Strategic Objectives	
1	Modernise and develop a risk-based, thematic approach to flood and coastal erosion risk management
2	Become data and information rich to facilitate better decision-making
3	Champion nature-based solutions and sustainable drainage
4	Educate, advise and empower our communities to become more resilient
5	Promote and support community adaptation and partnership working

4.1.1 The five LFRMS objectives set out how the LFRMS aims to manage flooding in Carmarthenshire with a long term, strategic view which recognises the nature of flood and coastal erosion risk with respect to the challenges of climate change. Focusing on the enhancement of knowledge, improved county-wide collaboration, and sustainable, modern methodologies, the strategic objectives of the LFRMS offer many potential benefits to the population and environment of Carmarthenshire, and strongly align with the objectives of this SEA.

4.1.2 Flash flooding is a significant pressure on Carmarthenshire's biodiversity, with the potential to negatively impact species performance and cause habitat fragmentation. Strategic Objective 1 aims to address this issue by adopting a modern, risk based, thematic approach to flood and coastal erosion risk management, seeking to improve the mitigation of flash flooding and create opportunities to protect biodiversity. Additionally, Objective 1 seeks to enhance water quality by reducing flood-induced pollution and may help safeguard other natural resources such as soil, by minimising contamination and soil erosion caused by flooding. By strengthening Carmarthenshire's flood management practices, Strategic Objective 1 also contributes to the overall health and wellbeing of the population.

4.1.3 At present, Carmarthenshire's available data surrounding its natural environment is limited. Strategic Objective 2 seeks to address this limitation through becoming data and information rich, enabling better decision making which can more effectively protect and enhance biodiversity. This is reflected in all SEA Objectives, with public health, inequalities, water quality, natural resources, climate change and historical environment all having the potential to be improved or protected by enhancing the knowledge and understanding of the county.

4.1.4 By utilising nature-based solutions and sustainable methodologies as proposed under Strategic Objective 3, the biodiversity and natural resources of Carmarthenshire can be prioritised in the LFRMS. Strategic Objective 3 emphasises dedication to sustainable drainage, seeking to limit contributions to climate change in comparison to more environmentally harmful methods. By championing nature-based solutions, the LFRMS also seeks to take a less invasive approach to the protection of Carmarthenshire's landscape, with improved potential to protect the historical environment. By strengthening Carmarthenshire's flood management practices, Strategic Objective 1 also seeks to improve the overall health and wellbeing of the population.

4.1.5 The emphasis on community collaboration described under Strategic Objective 4 demonstrates the LFRMS dedication to create a more resilient and adaptable Carmarthenshire. Strategic Objective 4 could have the potential improve the mental and physical health of its population by providing the necessary education and transparency, which can also facilitate a healthy relationship with the community. Strategic Objective 4 would also seek to limit and adapt Carmarthenshire to climate change by equipping the community with the knowledge and advice to navigate its increasing flooding frequency and intensity.

4.1.6 Through gaining insights from partnerships and the community, Strategic Objective 5 aims to develop an understanding of how Carmarthenshire is affected by climate change, facilitating more effective adaptation to its pressures. Furthermore, Strategic Objective 5 demonstrates the LFRMS commitment to promoting community adaptation and partnership working, seeking to prioritise the communities needs and fostering adaptation strategies that respect Carmarthenshire's unique sense of place. Through county-wide collaboration, this approach aims to protect the existing historic environment, helping to preserve the county's cultural heritage while supporting sustainable, community-driven solutions.

Table 4.1: Assessment of LFRMS Strategic Objectives

SEA Objective	1. Biodiversity	2. Health	3. Water	4. Natural Resources	5. Climate Change	6. Historic Environment and Landscape
Strategic Objective 1	✓	✓	✓	✓	✓	O
Strategic Objective 2	✓	✓	✓	✓	✓	✓
Strategic Objective 3	✓	✓	✓	✓	✓	✓
Strategic Objective 4	O	✓	O	O	✓	O
Strategic Objective 5	O	✓	O	O	✓	✓

4.2 Measures

Measures	
Measure 1	Thematic Incident Management
Measure 2	Maintain a pipeline of capital works business cases
Measure 3	Increase community resilience
Measure 4	Increase public engagement and consultation

Measures

Measure 5	Champion innovation and technology
Measure 6	Develop a catchment-based approach to FCERM
Measure 7	Provide expert advice and counsel
Measure 8	Manage FCERM permitting and consenting
Measure 9	Adopt and designate drainage systems and FCERM features
Measure 10	Enforcement

4.2.1 There are ten measures contained within Carmarthenshire's LFRMS, which outline how flood risk is intended to be managed within this strategy. Below is an assessment of how effectively these measures align to the objectives of this SEA.

4.2.2 By employing thematic management of flooding incidents, Measure 1 seeks to more effectively mitigate the resulting environmental and community impacts of flooding events than current methods. This aims to improve how the county responds to flooding and is likely to be compatible with each SEA Objective through the improved protection of natural, historical, and human environments.

4.2.3 Measure 2 seeks to provide tangible outcomes and benefits to Carmarthenshire through the development of knowledge and investigation into flood risk and drainage at a community level. This promotes the empowerment of communities, seeking greater community cohesion and citizen wellbeing, leading to likely computability with SEA Objectives relating to health, water and climate change.

4.2.4 Measures 3 and 4 demonstrate the LFRMS's continued commitment to Carmarthenshire's community. Through efforts to increase community resilience and the facilitation of public engagement, Measures 3 and 4 seek to improve community wellbeing and develop how the county adapts to climate change. This is likely to be compatible with SEA Objectives relating to health and climate change.

4.2.5 Through a focus on innovation and utilising modern technology, Measure 5 of the LFRMS seeks to develop Carmarthenshire's ability to protect and enhance the environment and natural resources by improving efficiency and creating cleaner technologies. This aims to enable the development of solutions which can balance human needs with environmental preservation and could enable Carmarthenshire to more effectively adapt to climate change through more effective management of flooding events. This measure would therefore be compatible with SEA Objectives relating to biodiversity, health, water, natural resources, and climate change.

4.2.6 By facilitating greater partnership working with partner Risk Management Authorities (RMAs) and adopting a more focused flood management plan, the catchment-based approach defined by Measure 6 seeks to maximise multiple environmental, landscape and community benefits. This model is used by most of Carmarthenshire County Council's strategic partners and focuses resources and investment on the catchments and communities of greatest risk, seeking to reduce inequalities across the county and mitigate the impacts of flooding events. This measure would therefore be compatible with all SEA Objectives.

4.2.7 The provision of expert advice throughout the operational period of the LFRMS detailed in Measure 7 enhances Carmarthenshire's ability protect the natural and human environment through accurate and informed management of flooding events. 'Expert advice' is expected to include environmental expertise and therefore would help to ensure any flood defence measures do not result in adverse effects on the wider environment, including historic environment, landscape and townscape and natural resources. This measure would therefore be compatible with all SEA Objectives.

4.2.8 Measure 8 seeks to maximise support for the sustainable development and regeneration of Carmarthenshire, delivering statutory obligations and ensuring multiple benefits including water quality, biodiversity, conservation, and wellbeing through the more effective management and understanding of flood risk. However, further clarity is needed to assess how it may impact the historic environment. This measure would therefore be compatible with SEA Objectives relating to biodiversity health, water, natural resources, and climate change.

4.2.9 Measure 9 outlines how the LFRMS adheres to certain legislation including 'The Sustainable Drainage (Approval and Adoption Procedure) (Wales) Regulations 2019' and Measure 7 of the 'National Strategy for Flood and Coastal Erosion Risk Management in Wales'. This enforces robust asset management and a maintenance scheme which seeks to improve flood management and reporting within the county and is therefore compatible with all SEA Objectives.

4.2.10 The effective enforcement of the LFRMS and its methodologies outlined in Measure 10 seeks to improve how Carmarthenshire experiences and responds to flooding events, offering an abundance of potential benefits and protection for the environment and population of the county. This measure would therefore be compatible with SEA Objectives referring to biodiversity, health, water, natural resources, and climate change.

Table 4.2: Assessment of LFRMS Measures

SEA Objective	1. Biodiversity	2. Health	3. Water	4. Natural Resources	5. Climate Change	6. Historic Environment and Landscape
Measure 1	✓	✓	✓	✓	✓	✓
Measure 2	O	✓	✓	O	✓	O
Measure 3	O	✓	O	O	✓	O
Measure 4	O	✓	O	O	✓	✓
Measure 5	✓	✓	✓	✓	✓	O
Measure 6	✓	✓	✓	✓	✓	✓
Measure 7	✓	✓	✓	✓	✓	✓

SEA Objective	1. Biodiversity	2. Health	3. Water	4. Natural Resources	5. Climate Change	6. Historic Environment and Landscape
Measure 8	✓	✓	✓	✓	✓	O
Measure 9	O	O	O	O	O	O
Measure 10	✓	✓	✓	✓	✓	O

5 Assessment of the Action Plan

5.1.1 The Flood Risk Management Plan (FRMP) has been developed to implement the LFRMS at a local level by firstly identifying communities at the highest risk of flooding and secondly, identifying suitable interventions to reduce this risks flooding posed within the identified communities. Carmarthenshire County Council have identified 28 priority communities at high risk of flooding from either fluvial or pluvial sources.

5.1.2 The assessment of the proposed actions of the FRMP is set out in Appendix A.

6 Cumulative Effects

6.1.1 In addition to appraising the components of the LFRMS and Action Plan individually, they have been appraised in-combination for their likely cumulative, secondary and synergistic effects against each SEA Objective. There were no changes to the cumulative effects following the finalisation of the LFRMS. The results of this process are summarised in Table 6.1.

Table 6.1: Cumulative effects assessment for the LFRMS

SEA Objective	Cumulative Effects	
1. Biodiversity	+	Flooding can pose a significant threat to biodiversity by disrupting habitats, displacing species, and altering water quality through increased sedimentation and pollutant runoff. While some ecosystems such as wetlands rely on natural flooding; extreme, prolonged, or recurrent flooding events can erode riverbanks, destroy vegetation, and reduce habitat connectivity, threatening species survival. Additionally, flooding can introduce invasive species, further destabilising native ecosystems. A sustainable, catchment-scale approach to flood management has the potential to deliver synergistic benefits for biodiversity by enhancing habitat connectivity, soil stability, and water quality. Natural flood management techniques, such as wetland restoration and regenerative farming, could reduce peak flows and erosion, while catchment-scale flood alleviation schemes could further support habitat resilience. Furthermore, the targeted retrofitting of SuDS has the potential to support urban biodiversity and improve local water quality, reducing the risk of pollution and enhancing ecological connectivity, and improved asset management and maintenance could help to protect existing flood defences and natural habitats, promoting long-term resilience for biodiversity across Carmarthenshire. Conversely, hard engineering actions such as the creation of flood walls and embankments have the potential to negatively affect biodiversity by disrupting natural hydrological processes, altering habitats, and fragmenting ecological networks. If not strategically planned, these structures have the potential to isolate species and degrade habitats. However, these effects can be mitigated through appropriate design considerations, such as integrating green infrastructure into engineered solutions. Overall, it is considered to be likely, with a medium to high level of certainty, that the cumulative effects of the proposed actions are expected to result in long-term positive effects on biodiversity, provided that natural solutions are prioritised where possible, and hard engineering actions are designed to minimise ecological disruption. Ensuring effective monitoring and adaptive management will be critical to maximising biodiversity enhancements while minimising and mitigating potential negative impacts.
2. Health	+	Flood risk and flooding events can pose a significant threat to physical and mental human health through the potential for physical harm and elevated stress. The proposed flood risk management actions are expected to have cumulative positive effects on physical and mental health by reducing the risk of flooding, improving environmental quality, and promoting community resilience. Natural flood management techniques and SuDS have the potential to mitigate flooding events while also enhancing green spaces, which can improve air quality, opportunities for physical activity, engagement with nature, and overall well-being. Hard engineering solutions, such as flood walls and improved drainage infrastructure, could provide security for at-risk communities, reducing the stress and anxiety associated with flood risk. Additionally, asset management and maintenance, alongside improved mapping and modelling, could enhance early warning systems and emergency preparedness, empowering residents and reducing health inequalities linked to flood vulnerability. By integrating community engagement, property flood resilience, and education initiatives, the proposed actions could help to build psychological resilience and a sense of preparedness, allowing local residents to feel more in control of their potential flood risk, protection, and subsequent recovery. However, consideration would be necessary regarding

SEA Objective	Cumulative Effects	
		individual property resilience, as this action has the potential to increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. Overall, the proposed actions are expected to result in long term positive effects on physical and mental health by reducing flood risk, enhancing community resilience, and improving environmental quality, provided that socially inclusive engagement, ongoing maintenance, and appropriate consideration of property level measures are prioritised.
3. Water Quality	+	Flooding can significantly degrade water quality by mobilising pollutants, including sewage, agricultural runoff, and waste into watercourses. The proposed flood risk management actions are expected to have cumulative positive effects on water quality by reducing pollution, sedimentation, and surface water runoff. Natural flood management techniques, such as wetland restoration, gully blocking, and strategic planting have the potential to help to filter pollutants, trap sediments, and enhance ground water recharge, improving both surface and groundwater quality. The retrofitting of SuDS in targeted locations could further support natural filtration and attenuation, reducing the direct discharge of contaminants into watercourses. Improved asset management and maintenance of drainage infrastructure, flood defences, and embankments could ensure that systems function effectively, preventing blockages and reducing the risk of sewer overflows. However, hard engineering solutions can have positive or negative effects, as actions such as improving existing drainage infrastructure can enhance water quality via improved water management, whereas actions such as flood walls may have localised negative effects if they disrupt natural flow patterns or concentrate pollutant discharge. These can be mitigated through strategic planning and integration with less intrusive flood management actions. Overall, the proposed actions set out in the LFRMS are expected to result in long-term positive effects on water quality, particularly where nature-based solutions and sustainable drainage are prioritised alongside effective asset maintenance and monitoring.
4. Natural Resources	+	Flooding can degrade natural resources by causing soil erosion, sediment displacement, and potential air pollution from damp conditions and the release of contaminants. Furthermore, flooding can strip soil of nutrients and organic matter, reducing agricultural productivity and destabilising landscapes. The proposed flood risk management actions could have cumulative positive effects on air and soil quality by enhancing land stability, reducing erosion, preventing waterlogging, and carbon sequestration. Natural flood management techniques proposed in the LFRMS such as regenerative farming and strategic tree planting have the potential to stabilise soils, enhance carbon sequestration, and improve land permeability, reducing the risk of erosion and nutrient loss. Furthermore, the targeted retrofitting of SuDS could help to filter pollutants from runoff, preventing the contamination of soil. Improved asset management and maintenance of drainage infrastructure could further ensure that sediment and pollutants are effectively managed, reducing degradation of land resources. However, hard engineering solutions have the potential to negatively impact local natural resources during construction, though could offer long term protection to soil once established. Individual property flood defences also have the potential to have a negative impact on local natural resources unless this is appropriately considered. Overall, the proposed actions are expected to result in long-term positive effects on natural resources by reducing soil degradation, enhancing air quality, and promoting sustainable land management practices across the borough, however, it is essential that potential negative effects to natural resources are considered when implementing new potentially invasive actions such as hard engineering and property level flood defences.
5. Climate Change	+	Flooding is predicted to become more frequent and severe due to climate change, with rising sea levels, increased rainfall, and more extreme weather events intensifying flood risk. Without intervention, these changes could lead to greater damage to infrastructure, disruption to communities, and long-term environmental degradation. The proposed flood risk management actions have the potential to contribute to both climate change adaptation and mitigation, improving long-term climate resilience across Carmarthenshire.

SEA Objective	Cumulative Effects	
		Natural flood management techniques could enhance carbon sequestration, regulate water flow, reduce flood peaks, and reduce pressure downstream, helping to both limit climate change and adapt to its effects. The targeted retrofitting of SuDS could further improve surface water management, reducing urban flooding and runoff. Catchment scale alleviation schemes are expected to take a holistic, nature-based approach, ensuring long term flood resilience while also preserving ecosystems that support climate regulation. Hard engineering solutions could provide critical protection to high-risk areas but may require careful strategic planning to avoid increasing carbon emissions from construction and maintenance. These actions may also need to be enhanced into the future to accommodate the effects of climate change, thus strategic planning is essential to their effectiveness. Improved asset management and maintenance could also mitigate this risk, as this action could help to ensure existing flood defences remain effective and reduce the need for high-carbon responses. Overall, the proposed actions are expected to have long-term positive effects on climate resilience, particularly when nature-based solutions are integrated alongside strategic infrastructure improvements and hard engineering actions. To effectively limit and adapt to climate change, it will be essential to ensure the use of maintenance and mitigation measures for hard engineering solutions across the borough.
6. Landscape and Heritage	+	Flooding poses a significant threat to historic environments, landscapes, and townscapes, potentially causing structural damage to heritage assets, erosion of historic sites, and degradation of landscapes. Without intervention, increased flooding events could lead to a loss of cultural heritage and long-term changes to the character of communities. The proposed flood risk management actions aim to protect and enhance Carmarthenshire's historic and natural landscapes while safeguarding heritage assets from flood related damage. Natural flood management techniques proposed under the LFRMS have the potential to integrate with the natural landscape, providing flood mitigation without disrupting the landscape character or historic sites. The retrofitting of SuDS could help to manage runoff and flood risk in urban areas while minimising the potential visual pollution of flood management infrastructure, offering potential opportunities for green space enhancement, and improving the visual character of townscapes. Furthermore, catchment-scale flood alleviation schemes are expected to take a holistic approach to reducing flood risk without compromising the cultural heritage of the borough. However, hard engineering solutions proposed in the LFRMS must be sensitively designed to avoid visual intrusion and preserve the historic character of affected areas, while asset management and maintenance would play a crucial role in protecting existing heritage and flood defence structures, ensuring that defences do not fall into disrepair or cause unintended harm to the surrounding environment. Overall, the proposed actions in the LFRMS are expected to result in long-term positive effects to the historic environment, landscape, and townscape, particularly where nature-based solutions and strategically designed infrastructure improvements are prioritised to enhance flood resilience while respecting Carmarthenshire's cultural heritage.

7 Mitigation and Conclusion

7.1 Avoiding, reducing or mitigating negative effects and maximising positive effects

7.1.1 A summary of the SEA recommendations made for the draft FRMP is presented in Table 7.1.

Table 7.1: SEA recommendations for the LFRMS

Section of the FRMP	Recommendation	Response
General	Wording of the actions should be strengthened from 'could' to 'will'	Actions amended
	Incentivise SuDS adoption as a method of property flood resilience to enhance the wellbeing of the population with less-invasive, sustainable flood management techniques.	No change – statutory requirement already in place through SuDS Approval Body role.
	Design multi-functional SuDS features to improve both flood resilience and public accessibility.	No change
	Combine multiple Natural Flood Management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity.	No change
	Any flood risk management measures should be mindful of the potential cultural heritage resources that may be affected by schemes, which may include archaeological resources yet to be identified.	Noted
	Collaborate with residents, businesses, and landowners to map undocumented assets and identify recurring issues.	Amendments to 'asset management' action
	Introduce proactive maintenance schedules by implementing routine inspections and maintenance.	No change
	Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction.	Actions amended
	Residents can provide valuable insight into recurring issues such as blocked drains or instances of high run-off. The development of an accessible public reporting system could enhance water management.	No change – already considered as part of annual review.
	Natural Flood Management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs.	No change
	Ensure the retrofit of SuDS targets key flood receptors to maximise benefits for the community.	No change
	Use historical flood data and climate change projections to inform maintenance strategies.	No change
	It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities.	No change

Section of the FRMP	Recommendation	Response
	The enhancement of biodiversity should be considered as part of all actions.	No change – Environment Act duty
	It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere.	No change - aspirational
	Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible.	No change
	Catchment wide Natural Flood Management measures should consider the water quality, air, and soil quality/quantity issues in the area and seek to include improvement measures as part of designs.	No change – covered in 'NFM' actions
	Promote the use of sustainable, nature-based techniques to property flood management to reduce the stress of flood risk while providing education on the benefits of nature-based solutions. This has the potential to be effective into the future, increasing the potential for the locality to adapt to future flood risk.	No change – already actioning.
	The longevity of the effectiveness of the hard engineering flood defences should be considered, as the increase of their scale may be necessary repeatedly into the future, potentially causing disruption to the natural and historical environment.	No change
	Combine SuDS with public resources/ spaces such as recreational areas for a broader impact on the community.	No change
	Utilise climate change models to predict future flood risks and ensure maintenance plans address the evolving threat.	No change
	Hard engineering solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible.	No change
	Further detail on 'hard engineering' solutions should be set out.	These actions have been largely removed.
Burry Port	Natural Flood Management measures, such as wetlands, should consider the integration of ways in which the community could benefit.	Agree – if this type of measure was implemented, then multiple benefits is a part of that evaluation
	Workshops or the provision of resources could aid residents in the appropriate methods and use of property flood resilience strategies to maximise the benefits and minimise the risk of negative impacts.	No change but plans in place to expand community engagement programme.
	The regular assessment of SuDS could mitigate any unforeseen negative effects and aid in the adaptation to future risks.	Agreed, would have an agreement management and monitoring plan.
	Offer public education on the proper use and maintenance of property flood resilience to maximise the benefits and minimise any potential negative impacts on the townscape and natural environment.	No change, but if PFR is facilitated by the Council then this would be incorporated.

Section of the FRMP	Recommendation	Response
	To ensure health inequalities are not exacerbated, consideration of the wider effects of property flood resilience is necessary.	No change.
	Permeable driveways could assist in reducing flood risk to the surrounding properties.	Agree – no change.
	Adopt a biodiversity first approach to Natural Flood Management techniques, such as utilising native species for wetland restoration to enhance local biodiversity and resilience against invasive species.	No change - aspirational
	Ensure asset management and maintenance for key assets includes ecological considerations in drainage or infrastructure upkeep to protect and enhance biodiversity.	No change.
	The retrofit of SuDS can enhance the water retention and management capabilities within present green spaces such as Gorslas Park, reducing flood risk within Gorslas centre.	Agree – but scope of FRMP is not to go into this level of detail.
	Retrofit existing paved surfaces with permeable options to reduce runoff without significantly altering the townscape.	No change – but is part of optioneering process.
	Create opportunities for schools to engage in restoration activities considering the risk of flooding in their local area.	No change – already embedded where possible.
	During community engagement, facilitate discussion and knowledge sharing of the local area and sustainable flood management techniques to develop local understanding of flood management and potentially implement shared ideas.	No change.
Llanelli	Facilitate collaboration with further organisations alongside the Dŵr Cymru Welsh Water to maximise the understanding of the current risks and assets and the potential of future flood management.	No change.
	To provide more detail on the removal of the Dafen Crossing trash screen	Detail unavailable at this stage.
	Alongside the flood warning system for at-risk residents, the locality could offer community drills and education sessions to maximise the potential of this action.	Aspirational – may need to be NRW led.
	More details surrounding the catchment flood alleviation scheme works at Heol Buckley.	More detail provided in FRMP report.
	Consider the use of SuDS and other Natural Flood Management techniques surrounding the at-risk properties to reduce flood risk sustainably, rather than increasing the scale of hard engineering in the locality.	No change – but part of optioneering process.
	Maximise the potential for Natural Flood Management in the upper catchment to enhance biodiversity, particularly if there is a focus on hard engineering and property flood resilience in Furnace. This can be achieved through tree planting and wetland creation amongst other means	No change – not considered appropriate by the Council after optioneering.

Section of the FRMP	Recommendation	Response
	Incorporate sustainable and strategic development planning and SuDS into the public promotion of property flood resilience in attempt to mitigate any of its potential negative effects and maximise its positive effects.	Agree – Council seeking to work with developers.
	Natural Flood Management measures should consider the integration of ways in which the community benefit, such as walkways.	No change.
	Implement SuDS features that also improve public spaces.	No change.
	Consider the enhancement of existing flood defences and assets before implementing new defence schemes. It is recommended to only utilise hard engineering if the existing assets and their improved maintenance/management is not deemed adequate for future flood risk.	No change – but part of optioneering process.
	Consider the integration of GBI and SuDS to function collaboratively to current flood defences in Dafen. This can provide a holistic approach to flood management and reduce the need for hard engineering.	No change.
Loughor Amman	Ensure new flood defences are designed to accommodate future increases and intensity of rainfall and flooding.	No change.
	The establishment of a local volunteering monitoring network could enhance the monitoring of local assets and flood risk within North Ammanford.	No change – part of community engagement programme.
	Combine multiple Natural Flood Management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity.	Agree – subject to resource
	Catchment wide flood alleviation measures could consider the air quality issues in the area and seek to include air quality improvement measures as part of designs.	No change – this is aspirational.
	Locate and map all drainage infrastructure ensuring an up-to-date database of locations and conditions. This can ensure future asset management plans are accurate and can best defend Lower Brynamman.	No change – already embedded in the LFRMS.
	Create a tiered system where critical infrastructure and receptors such as Crosshands Park receives priority maintenance and investment.	Agree – Working in partnership with others such as regeneration could help this.
	Conduct climate vulnerability assessments to determine whether assets and infrastructure can withstand the future risks of climate change.	No change – aspirational.
	Use historical flood data and climate change projections to inform maintenance strategies.	No change.
	Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction.	No change – part of the feasibility and design process.
	Natural Flood Management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs.	Can be considered in the design process.

Section of the FRMP	Recommendation	Response
	It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities.	Agreed.
Lower Towy	Incentivise the use of SuDS on roofing throughout Pensarn.	No change – aspirational.
	Ensure flood defence breach scenarios are developed with residents aware of emergency actions.	No change – Natural Resource Wales driven.
	Explore green infrastructure to reduce surface water entering the sewer network, minimising overflow risks.	Agreed.
	Reduce reliance on traditional flood management methods such as piping and integrate more SuDS such as permeable paving and rain gardens to slow and filter runoff.	Agreed.
	Foster a long term relationship with the University, which could enhance future flood resilience in Carmarthen through research and collaborative working.	Aspirational – this may be more of a long term goal.
	Facilitate collaboration with further organisations alongside University to maximise the understanding of current risks and local assets, and the potential of future flood management.	Agreed.
	Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction.	Agreed.
Teifi	Consider the integration of GBI and SuDS to function collaboratively to current flood defences in Drefach. This can provide a holistic approach to flood management and reduce the need for hard engineering.	No current plan in this location.
	Design multi-functional SuDS features to improve both flood resilience and public accessibility.	Agreed – SuDS deliver multiple benefits.
	If large scale hard engineering works are necessary, it is recommended to utilise natural flood management techniques where possible and offer mitigation strategies to the potential adverse effects on SEA objectives.	NFM will be considered as part of the feasibility process.
	Provide more detail on the hard engineering action to develop the Cwmann Trash Screen.	This will potentially be an upgrading on the existing screen.
	Public involvement in flood mapping workshops could incorporate local knowledge into modelling and mapping.	No change – part of public engagement plan.
	Natural Flood Management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs.	No change – aspirational.
	Utilise notification systems such as automatic text alerts or community sirens when flood risks arise.	No change – aspirational.

Section of the FRMP	Recommendation	Response
	Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction.	Agree – will explore opportunities in this catchment.
	Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible.	No had engineering schemes planned in this catchment.
	It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere.	No change.
Upper Towy	Temporary solutions should be used to compliment rather than replace sustainable flood defences like improved drainage systems, SuDS and Natural Flood Management.	No change.
Western	If designed with ecological considerations, the embankment could integrate habitat restoration, enhancing local biodiversity. The incorporation of sustainable drainage features could also be considered, helping to improve water quality and maximising the extension's ability to manage flood risk.	No change.
	Residents can provide valuable insight into recurring issues such as blocked drains or instances of high run-off. The development of an accessible public reporting system within community flood groups could enhance water management.	Current reporting system can be promoted during community engagement.

7.2 Stage E: Monitoring Effects

7.2.1 The SEA has identified the likely effects of the LFRMS on the SEA Objectives. An indication of the certainty and timescales of these effects has also been predicted. However, there is a risk that the sustainability effects of the LFRMS, including the effects of specific aspects or the cumulative effects of LFRMS in-combination, are different to those anticipated due to unforeseen circumstances. It is therefore an essential component of delivering sustainable development to monitor the effects of the LFRMS, in relation to the predicted effects. Regular monitoring then enables the Local Authority to alter plans as necessary should unexpected negative effects arise or expected positive effects not arise.

7.2.2 It is anticipated that Carmarthenshire County Council will be monitoring the implementation and effects of the LFRMS post-adoption to feed into future plan review and revision. Table 7-3 proposes a Monitoring Framework to keep track of the sustainability effects of the LFRMS, for which it would be appropriate to integrate with LFRMS monitoring. This is a draft and will be subject to discussion and refining with Carmarthenshire County Council. In addition to monitoring the extent to which the LFRMS results in the effects identified in the SEA, the Monitoring Framework provides an indication of the effects of the LFRMS on the environmental baseline in Carmarthenshire and this can be compared with future trends as set out in the SEA Scoping Report.

7.2.3 Over the lifetime of the LFRMS, new information, which will help inform the review of the LFRMS, will be added to the LFRMS Monitoring Framework. Other indicators are likely to remain constant, where they can inform the long-term outcomes for the LFRMS over the 20-year strategy period.

Table 7.2: Proposed Monitoring Framework

SEA Objectives	Cumulative Effects	Proposed Monitoring Indicators
1. Biodiversity		• Areas of habitat lost/ gained/ enhanced through LFRMS implementation • Length of linear habitats created/ maintained or enhanced, which increase the connectivity of biodiversity habitats • Number of Critical Support Services (hospitals, care homes, etc.) within areas of flood risk
2. Health		• Number of properties at risk of flooding from surface water, groundwater and ordinary watercourses • Area of green infrastructure created
3. Water Quality		• Amount of development within Flood Zones 2 and 3 • Percentage of new developments with SuDS • Number of properties at risk of flooding from surface water, groundwater and ordinary watercourses • Number of flood incidents from surface water, groundwater and ordinary watercourses • Number of waterbodies deteriorating in WFD status • Number of projects that incorporate water quality improvement measures
4. Natural Resources		• Percentage of contaminated land remediated • Number of new developments with soil management plans in place • Area of soil important for carbon storage identified and protected
5. Climate Change		• Number of projects incorporating consideration of carbon emissions and adaptation measures
6. Landscape and Heritage		• Proportion of historic environment assets at risk of flooding • Number of historic environment assets adversely affected by LFRMS implementation • Number of projects affecting/ enhancing historic environment assets • Number of projects affecting/ enhancing National Landscapes • Number of projects affecting/ enhancing locally important landscapes

7.3 Next Steps

7.3.1 This SEA Environmental Report will accompany the final LFRMS. Following approval, the LFRMS and SEA Environmental Report will be published.

7.3.2 The next stage of the SEA process will be the Post-Adoption Statement, which will be prepared following the adoption of the LFRMS.

Appendix A

Action Plan Assessment

Contents

SEA Objectives

1. To protect and enhance biodiversity avoiding damage to or loss of designated and undesignated wildlife sites
2. To improve physical and mental health and wellbeing for all and reduce health inequalities
3. To protect and enhance water quality
4. To protect and enhance natural resources, including air and soil
5. To limit and adapt to climate change
6. To protect and enhance the historic environment, landscape and townscape

1 Borough-Wide Actions

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
Prevention	Sustainable and Strategic Development and Water Cycle Strategy Planning	Ensure all new development is compliant with planning policy and that SuDS are implemented to manage runoff at source.	+	+	+	+	+	+	The 'Sustainable and Strategic Development and Water Cycle Strategy Planning' action has the potential to ensure future development in Carmarthenshire considers flood risk, water management, and climate adaptation, reducing exposure to flooding while promoting sustainable green and blue infrastructure, such as SuDS, which can lead to benefits for biodiversity, landscape, air and soil quality. This could support population health and wellbeing by enhancing how localities within Carmarthenshire mitigate the effects of flooding and better equips them for the future risks of climate change. Furthermore, the implementation of SuDS has the potential to positively affect water and soil quality through the enhanced management of runoff.
		Longevity	M-L	L	M-L	M-L	L	M-L	
		Reversibility	R	R	R	R	R	R	
		Certainty	M	L	M	M	L	H	

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
	Strategic Flood Consequences Assessment	Progress Stage 2 Carmarthenshire & Pembrokeshire SCFA building on from targets and actions of Stage 1 document (Atkins, 2019). Stage 2 to assess strategic candidate sites in more detail utilising existing NRW models or constructing new models where necessary. Llanelli Stage 2 Strategic Flood Consequences Assessment (WSP | Parsons Brinckerhoff, 2018) in support of Local Development Order	+	+	+	+	+	+	The 'Strategic Flood Consequences Assessment' action has the potential to enhance understanding of flood hazards and vulnerabilities, enabling informed decision making for land use and infrastructure planning. This would be likely to improve Carmarthenshire's climate resilience by reducing the risk of pollution, protecting natural resources and water quality, and safeguarding historic and urban environments from flood damage. Effective modelling and scenario testing should be effective tools to ensure accurate predictions and mitigation strategies with regards to flood risk, ensuring that the effects of climate change are also considered. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could reduce runoff, prevent pollution, and create resilient landscapes that better manage flood risk sustainably. Air quality may also be improved through natural flood management techniques, through planting that could be designed to
		Longevity	M	M	M	M	L	M	
		Reversibility	R	R	R	R	R	R	
		Certainty	L	L	M	M	M	L	

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
	Natural Flood Management	Given the typically rural nature of the Borough, Natural Flood Management techniques have been suggested as potential actions for the majority of at-risk communities to reduce runoff and peak flows of watercourses during major events. It is recommended that opportunities to deliver such schemes across the Borough are explored operating at the catchment scale and working collaboratively with other Risk Management Authorities (RMA)s, charitable trusts and local landowners to improve the way the landscape drains by replicating natural processes. This not only has the potential to reduce the risk of flooding, but also provider wider benefits such as carbon storage and improved biodiversity. Promotion of regenerative farming techniques, wetter farming or peat restoration could help landowners and farmers make a transition to practices that help reduce flooding without any loss of income.	++	+	++	+	+	+	maximise this potential. Through the use of non-invasive flood management strategies and regenerative farming techniques, this action has the potential to lead to significant positive effects for biodiversity and water quality; and positive effects for population wellbeing, natural resources, climate change, the townscape, and historical landscape.
		Longevity	S-L	M-L	M-L	M-L	L	S-L	

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
		Reversibility	R	R	R	R	R	R	
		Certainty	H	M	M	M	M	M	
Protection	Catchment Scale Flood Alleviation Schemes	It is recommended that actions proposed as part of this Action Plan are not considered in isolation and that multiple measures across each river basin district could provide benefit to multiple at-risk communities. This is particularly true of Natural Flood Management measures that should be considered on a catchment wide basis. Cooperation and collaboration with other RMAs and neighbouring LLFAs is recommended to deliver a true catchment based approach and achieve meaningful outcomes.	++	+	++	+	+	+	The proposed catchment-scale flood alleviation schemes would take a holistic approach to flood risk management, addressing issues at their source rather than just at flood prone areas. By restoring natural flow pathways, creating attenuation areas, and implementing further Natural Flood Management techniques, these schemes have the potential to support climate adaptation, and significantly enhance biodiversity and water quality. This action would also have the potential to protect natural resources, the townscape and historical landscape, and contribute to improved population wellbeing.
		Longevity	S-L	M-L	M-L	M-L	L	S-L	
		Reversibility	R	R	R	R	R	R	
		Certainty	H	M	M	M	M	M	

Preparedness - Flood Forecasting and Emergency Response,	**Public engagement / consultation and education including:** Insurance, Emergency Response Plans, Community Flood Plans, Multi Agency Flood Plans, Local Flood Risk Action/ Awareness Groups, Flood warning and Forecasting	These actions have been grouped together under the banner of Flood Forecasting and Emergency Response. Alternatively, they could be described as preparedness or resilience measures. This action plan has been prepared to prioritise actions for the 30 most at communities within Carmarthenshire. It is therefore recommended that these communities are empowered and informed by understanding the level of flood risk they are faced with. This should be promoted through public engagement, consultation and education. Local Flood Risk Action Groups should be set up and emergency flood plans set up at property and community level. It is recommended residents in all at risk communities are signed up to NRW's flood warning service. Property Flood Resilience has been highlighted as a targeted action for some specific communities in the plan however the techniques and technologies may wish to be explored and adopted by any concerned residents. In many instances, active community engagement is underway or else has been initiated. Successful lessons from these initiatives should be used to	+/-	+	+	+	+	+	Promoting public engagement, consultation, and education could empower communities by raising awareness of flood risk, promoting health and wellbeing, and encouraging proactive resilience methods. Ensuring engagement is inclusive and accessible would maximise community preparedness and participation. Insurance in case of flood related damage could reduce long term economic impacts on households and businesses. However, affordability and accessibility issues could have the potential to create health and wellbeing inequalities, particularly in high-risk areas. Emergency response plans could improve community safety and preparedness, ensuring timely and coordinated action during flood events. The preparation of such plans could protect health and wellbeing by reducing injury and distress. Community flood plans could provide localised strategies for response and recovery, increasing public awareness and resilience. These plans could be tailored to specific community risks, integrating local knowledge while aligning with wider multi-agency strategies to ensure effectiveness. The preparation of multi-agency flood plans could help to strengthen collaboration between local authorities, emergency services, and environmental agencies. By incorporating real-time flood forecasting and environmental data, these plans could support climate adaptation and landscape protection while ensuring communities receive accurate warnings. Local flood risk action/ awareness groups could enhance public engagement and knowledge-sharing, helping communities take ownership of flood resilience efforts. These groups have the potential to advocate for sustainable drainage solutions and other flood management methods which could support water quality, biodiversity, and climate resilience and population wellbeing.

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
		inform and help set up new community groups. CIWEM's Be Flood Ready resource provides a community of practice to help residents and communities be more resistant and resilient in the event of a flood.							Flood warning and forecasting would have the potential to provide critical early alerts, allowing communities and authorities to take preventative action and minimise flood damages. Advanced forecasting supports climate adaptation by integrating weather patterns, river levels, and coastal conditions.
		Longevity	S-L	S-L	S-L	S-L	S-L	S-L	
		Reversibility	R	R	R	R	R	R	
		Certainty	L	H	L	L	M	M	
Preparedness - Asset Management & Maintenance	**Asset management Plans:** Collate and map flood risk and drainage assets and data	It is recommended that a detailed borough wide study is undertaken appraising CCC assets, preparing mapping, and creating maintenance schedules for those assets most vulnerable.	+	+	+	+	+	+	A detailed borough-wide study appraising assets, preparing mapping, and creating maintenance schedules for vulnerable assets could enhance the effectiveness of flood risk management. By ensuring flood defences are robust and appropriately designed, asset management could help protect local biodiversity from flooding, safeguard soil and water resources, and reduce the risk of health hazards from flooding events. These plans would also have the potential to contribute to the long-term sustainability of natural resources, and support climate adaptation through resilient infrastructure. Additionally, this action could help to preserve the historic environment by protecting vulnerable heritage sites from flood damage, and regular inspections and maintenance of assets would prevent their degradation, reducing the
		Longevity	M	M-L	M-L	M-L	L	S-L	
		Reversibility	R	R	R	R	R	R	
		Certainty	M	L	M	M	H	H	

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
	Flood defence/watercourse/asset inspection and maintenance	Business as usual (BAU) activities for all RMAs to continue inspection and maintenance of all assets including watercourses, banks, defences, trash screens, culverts, bridges, gullies, outfalls and any other structures or assets.	+	+	+	+	+	+	risk of flooding that could negatively affect water quality, biodiversity, and public health. Business as usual (BAU) activities for all RMAs to continue the inspection and maintenance of all assets are also expected to enhance the effectiveness of flood risk management, with the potential to lead to beneficial effects against all SEA objectives.
		Longevity	M	M-L	M-L	M-L	L	S-L	
		Reversibility	R	R	R	R	R	R	
		Certainty	M	M	M	M	H	H	
Review	S19 Flood Investigation Reports	BAU activity for LLFA to undertake as necessary. Improvements to processes could be made through collaboration with other RMAs and communities to better understand flood risk events and recommend actions.	+	+	+	+	+	+	Reviewing and updating flood risk management strategies, plans, and actions may improve the potential for flood prevention measures to be effective and aligned with the protection of biodiversity. This action may also support public health by reducing the risk of flooding-related health hazards, contributing to improved physical and mental wellbeing across communities, particularly in vulnerable areas. By incorporating updated data on water quality, the review could potentially help prevent contamination during flood events, while also ensuring flood management aligns with the protection of natural resources, including air and soil. The action could also contribute to climate adaptation by enhancing flood resilience and supporting sustainable infrastructure that can reduce the impacts of climate change. Additionally, by reviewing and refining flood management plans, this action would have the potential to protect the historic
		Longevity	M-L	M-L	M-L	M-L	L	M-L	
		Reversibility	R	R	R	R	R	R	
		Certainty	L	M	L	L	L	L	

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
	Enforcement / penalties	BAU activity for LLFA to undertake as necessary.	+/-	+/-	+/-	+/-	+/-	+/-	environment, landscape, and townscape from flood damage, preserving cultural and heritage assets for future generations. The 'Enforcement/ penalties' action has the potential to lead to either positive or negative effects against all SEA objectives depending on what methods of flood management are enforced and how local residents are penalised, this effect is therefore uncertain, due to the level of information available at the time of assessment. The actions to record flooding incidents, improve data gathering, and improved mapping and modelling seek to strengthen flood risk management by providing more accurate and up-to-date information. This would help to protect biodiversity by enabling targeted flood prevention measures that minimise the risk of damage to wildlife sites and ecosystems. With better data, flood resilience could be improved, reducing the health risks associated with flooding and enhancing community wellbeing. By preventing contaminants from flooding into water systems, the improved understanding of flood dynamics would also aid in protecting water quality. Additionally, improved flood mapping has the potential to help protect natural resources by guiding the placement of flood defences that minimize environmental effects. Enhanced data collection could support climate adaptation by
		Longevity	S-L	S-L	S-L	S-L	S-L	S-L	
		Reversibility	R	R	R	R	R	R	
		Certainty	L	L	L	L	L	L	
	Review strategies, plans, measures, actions	Review and update relevant documents as necessary i.e. SFCA, development plans, modelling and mapping	+	+	+	+	+	+	
		Longevity	N/A	N/A	M-L	M-L	L	M-L	
		Reversibility	N/A	N/A	R	R	R	R	
		Certainty	N/A	N/A	L	L	L	L	

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
	Flood incident recording and improved data gathering	Business as usual activity for RMAs to continue to record flood incidents. RMAs may wish to consider reviewing processes and means of recording incidents to be more transparent, consistent, and collaborative in sharing data to improve understanding and reduce risk of flood incidents occurring again.	+	+	+	+	+	+	enabling more effective planning for extreme weather events, contributing to the limitation of climate change risks. Furthermore, this action could help to safeguard the historic environment, landscape, and townscape by ensuring that vulnerable heritage sites are identified and protected from flood damage. Partnership working in relation to flood risk management could foster collaboration between RMAs and third parties, incorporating relevant considerations into decision-making processes and ensuring that flood risk strategies account for factors beyond local expertise, such as biodiversity and population wellbeing. Through shared expertise and resources, partnership working has the potential to enhance public health by fostering joint efforts to reduce flood-related health risks and could enhance water quality protection by ensuring that flood management measures address and target pollution risks and contamination pathways. Furthermore, by combining knowledge and resources from diverse sectors, this action has the potential to help protect biodiversity and natural resources such as air and soil, ensuring sustainable land use and enhanced flood resilience. Partnership working could also strengthen climate change adaptation by enabling coordinated efforts to reduce flood risks associated with extreme weather, supporting long-term climate resilience. Additionally, collaborative approaches can ensure that flood management actions protect the historic environment, landscape, and townscape by involving
		Longevity	M-L	M	M-L	M-L	L	M	
		Reversibility	R	R	R	R	R	R	
		Certainty	M	L	M	M	H	M	
	Improved flood mapping and modelling	In some instances, detailed, localised hydraulic modelling has been recommended as an action to support specific at risk communities. More generally, strategic level hydraulic modelling should improve assessment of flood risk and help support documents and plans such as the Level 2 SFCA.	+	+	+	+	+	+	
		Longevity	M	M-L	M	M	L	M	
		Reversibility	R	R	R	R	R	R	
		Certainty	M	L	H	M	R	R	

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
	Partnership working (with RMAs & third parties)	In order to facilitate better flood risk management across the Borough, partnership working across RMAs (CCC, neighbouring LLFAs, NRW, DCWW) will be critical to its success. In addition, local knowledge and collaboration from charitable trusts, residents, and action groups will improve overall management of flood risk. Academic research may help provide greater insights into flood risk across the Borough. Potential collaboration opportunities have been identified for suggested actions throughout the action plan however these are not exhaustive.	+	+	+	+	+	+	heritage experts and local residents in the planning and implementation of flood risk measures. Securing funding for flood risk management, particularly for protected designated sites, could help to ensure biodiversity is safeguarded by enabling targeted flood prevention measures that protect sensitive ecosystems and habitats. It also has the potential to protect public health by securing resources for flood resilience projects that in turn reduce the risk of health hazards. Furthermore, this action could help to ensure that natural resources, such as air and soil, and water quality are protected through flood risk measures that minimize environmental impact. By investing in flood resilience projects, this action has the potential to contribute to climate change adaptation, helping communities and ecosystems adapt to changing weather patterns and rising flood risks. Funding directed towards designated sites/features could also support the preservation of the historic environment, landscape, and townscape by ensuring that vulnerable heritage areas are protected from flooding and degradation. Regularly updating residents and business owners on flood risk management progress could enhance public
		Longevity	M-L	M	M-L	M-L	L	M-L	
		Reversibility	R	R	R	R	R	R	
		Certainty	M	L	H	H	M	M	

Action	Potential Action	Description	SEA Objective						Appraisal
			1 Biodiversity	2 Health & Wellbeing	3 Water Quality	4 Natural Resources	5 Climate Change	6 Heritage & Landscape	
	Sources of funding including those that are aimed at protecting designated sites	Work collaboratively with other RMAs to find alternative avenues and sources of funding, including Welsh Government and third parties.	+	+	+	+	+	+	awareness and engagement, which could contribute to improving physical and mental health and wellbeing by keeping communities informed about flood risks and the measures in place to reduce them, alleviating stress and promoting a sense of security. This action is not expected to have an effect on biodiversity, water quality, natural resources, or climate change adaption.
		Longevity	M-L	L	M-L	M-L	L	M-L	
		Reversibility	R	R	R	R	R	R	
		Certainty	L	L	L	L	L	L	
	Updating residents / business owners on project progress and flood risk management work	As an extension to the community engagement and education action, and in the spirit of collaboration with third parties, CCC and other RMAs should act with honesty and transparency to update residents / business owners on project progress and flood risk management work.	0	+	0	0	0	+	
		Longevity	N/A	S-M	N/A	N/A	N/A	M	
		Reversibility	N/A	R	N/A	N/A	N/A	R	
		Certainty	N/A	H	N/A	N/A	N/A	L	

2 Gwendraeth Burry Port

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Burry Port	Prevention	Natural Flood Management	Natural Flood Management techniques in upper Nant Dyfatty and Dwynany Streams catchments could reduce peak flows and reduce pressure downstream. Floodplain reconnection / storage areas in town could reduce flooding.	++	+	++	+	+	+	The urban town of Burry Port is located towards the south east coast of Carmarthenshire. Areas within the centre of the town are at high risk of flooding from rivers, with the coastal areas at a high flood risk from the sea. Overall, there is minimal risk of surface water flooding. The proposed 'Natural Flood Management' action is expected to benefit all SEA objectives, reducing the risk of flooding while potentially offering significant enhancements to water quality and biodiversity. This action also has the potential to protect natural resources, enhance future adaptability to climate change in a sustainable, non-invasive manner, and reduce the risk to population wellbeing. The 'Asset Management and Maintenance' action has the potential to enhance the flood management of Burry Port while improving public wellbeing, future adaptability, and protecting water quality and natural resources. This can be achieved through the decreased risk of infrastructure failures, extended lifespan of known assets, and mitigation of threats as they arise. This action would focus on maintaining assets already in place, reducing the need for new flood defences with the potential to negatively affect the townscape, historical landscape, and biodiversity. The potential reduction of flood risk also offers further protection to biodiversity in the locality.
			Longevity	S-L	M-L	M	M	L	M	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
		Asset Management and Maintenance	Improve knowledge of sub-terranean drainage assets and road drainage.	+	+	+	+	+	+	
			Longevity	M-L	L	L	L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Longevity	M	L	M	M	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
		Catchment scale flood alleviation schemes	As relatively small catchments are contributing to the flood risk in this community pilot catchment scale Flood Alleviation Scheme with focus on NFM measures could be appropriate.	+	+	+	+	+	+	The proposed catchment-scale flood alleviation schemes would take a holistic approach to flood risk management, addressing issues at their source rather than just at flood prone areas. By restoring natural flow pathways, creating attenuation areas, and implementing further Natural Flood Management techniques, these schemes have the potential to support climate adaptation, and significantly enhance biodiversity and water quality. This action could also have the potential to protect natural resources, the townscape and historical landscape, and contribute to improved population wellbeing **Recommendation**: wording of the actions should be strengthened from 'could' to 'will'. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity.
			Longevity	M	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	L	L	L	M	L	
Ferryside	Prevention	Natural Flood Management	Natural Flood Management techniques in upstream catchments could reduce peak flows and reduce pressure downstream.	+	+	+	+	+	+	As a small rural seaside town located on the Tywi estuary, Ferryside experiences intense rainfall and thunderstorms from the Atlantic Sea and features steep land immediately inland, which results in fast water flows. This town is at high risk of flooding from the sea, though has not experienced frequent historic flooding events, presenting a low risk of surface water flooding.
			Longevity	S-L	M	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	M	M	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
		Asset Management and Maintenance	Evaluate Outfall 1904 again due to increased highways flooding. Investigate if capacity of these could be improved.	+	+	+	+	+	+	Key flood receptors within Ferryside are Ferryside Railway Station and Ferryside Primary School. The preventative actions would be expected to have benefits to all SEA objectives by reducing peak flows, reducing pressure downstream, and enhancing the capacity of drainage outfalls. All of which contribute to improved water quality and its management within and surrounding Ferryside as part of wider nature-based solutions for environmental management. CCTV surveys of drainage could help to monitor drainage outfalls to allow for adjustments and enhancements when necessary. Through shared expertise and resources, partnership working has the potential to enhance all SEA objectives by fostering joint efforts to reduce flood-related risks. Working with Dŵr Cymru Welsh Water (DCWW) to develop a master drainage plan has the potential to improve flood management within Ferryside, supporting its potential to enhance all SEA objectives. Furthermore, seeking grant funding to better evaluate flood risk, action potential interventions, and working with NRW to highlight the risk of flooding from the local Cwm Mill Stream could further enhance flood management within Ferryside by improving access to resources and working collaboratively to address local
			Longevity	M-L	L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
			CCTV surveys of drainage	+	+	+	+	+	+	
			Longevity	M-L	L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
	Review	Partnership working	Work with DCWW to develop a master drainage plan	+	+	+	+	+	+	
			Longevity	M-L	M-L	M-L	M-L	M-L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	

			Description	SEA Objective						Appraisal and Recommendations
Community	Action Type	Potential Action		1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Support NRW and highlight the risk from Cwm Mill Stream (Cwm Mill Stream is a main river and the legislative powers for management and funding for management lie with NRW).	+	+	+	+	+	+	risks, potentially having a positive effect on all SEA objectives. Community engagement and facilitating local flood risk action/ awareness groups could benefit all SEA objectives by enhancing public engagement and knowledge-sharing, helping communities take ownership of flood resilience efforts. These groups have the potential to advocate for sustainable drainage solutions and other flood management methods which could support water quality, biodiversity, climate resilience and population wellbeing. Furthermore, these engagement sessions could aid in the education of local residents relating to individual property level interventions, potentially reducing the risks of altering the local landscape and preventing negative effects to SEA Objective 6. The 'Property Level Interventions' action has the potential to improve the mental and physical wellbeing of residents within Ferryside. While implementing property-level flooding measures can protect individual properties and increase climate resilience, a lack of awareness and consideration of the properties' surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, erosion, alteration to the townscape, and negative effects on biodiversity and water quality.
			Longevity	M-L	M-L	M-L	M-L	M-L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
			Seek grant funding from WG to further evaluate the flood risk and look at options for interventions to manage the risk via a business case.	+	+	+	+	+	+	
			Longevity	M-L	M-L	M-L	M-L	M-L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
	Preparedness	Community Work	Continue our community engagement and education of risk and interventions	+	+	+	+	+	+	**Recommendation**: Wording of the actions should be strengthened from 'could' to 'will'. **Recommendation:** Natural flood management measures, such as wetlands, should consider the integration of ways in which the community could benefit. **Recommendation:** Adopt a biodiversity first approach to natural flood management techniques, such as utilising native species for wetland restoration to enhance local biodiversity and resilience against invasive species. **Recommendation:** Utilise climate change models to predict future flood risks and ensure maintenance plans address the evolving threat. **Recommendation:** During community engagement, facilitate discussion and knowledge sharing of the local area and sustainable flood management techniques to develop local understanding of flood management and potentially implement shared ideas. **Recommendation**: Ensure that where property level interventions are implemented, the surroundings of the property are taken into consideration. It is also recommended to ensure that property level interventions don't exacerbate flooding impacts elsewhere or on properties which have lesser protection.
			Longevity	M-L	S-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
	Protection	Property Level Protection	Implementation of property level protection (Subject to funding)	-	+/-	-	-	+	+/-	
			Longevity	S-L	S	M	M	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	H	M	M	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Kidwelly	Prevention	Asset Management and Maintenance	Create asset management plans for key assets and carry out regular inspection and maintenance	+	+	+	+	+	+	A small town on the south coast and the Gwendraeth estuary, Kidwelly was formally a heavy industry town with an active harbour, exporting Gwendraeth valley anthracite. It is home to several key flood receptors such as Kidwelly Castle, Railway station, and schools. Kidwelly has been impacted by un-forecasted short sharp rainfall events, which overwhelm local watercourses, drainage, and cause further significant issues. There has been substantial community work with regards to flood risk management. The preventative actions for Kidwelly could provide benefits to the wellbeing and protection of the population, natural resources, water quality, and climate change adaptation due to the opportunities to reduce runoff and peak flows at targeted locations, helping Kidwelly to manage its rainfall events into the future. The regular inspection and maintenance of the sustainable strategies described could further enhance Kidwelly's capability to adapt to future climate change. These non-invasive actions could also aid in the protection of the historical environment, improve climate resilience, and reduce flood risk within the townscape without compromising its built heritage. SuDS also offer the opportunity to enhance water quality and biodiversity while enhancing flood management in Kidwelly, through the incorporation of features such as ponds and green roofs. The 'Property Level Interventions' action has the potential to improve the mental and physical wellbeing
			Longevity	M-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	M	M	M	M	
		Retrofit SuDS	Seek opportunities to retrofit SuDS at targeted locations to reduce runoff and/or provide attenuation.	+	+	+	+	+	+	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
		Natural Flood Management	Seek opportunities for Natural Flood Management techniques in upper catchment could reduce peak flows and reduce pressure downstream. Some attenuation schemes within community on fringes of urban area could provide benefit.	+	+	+	+	+	+	
			Longevity	S-L	M-L	S-L	S-L	L	S-L	
			Reversibility	R	R	R	R	R	R	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Certainty	H	L	H	H	M	M	of residents within Kidwelly. While implementing property-level flooding measures can protect individual properties and increase climate resilience, a lack of awareness and consideration of the properties' surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, erosion, alteration to the townscape, and negative effects on biodiversity and water quality. The 'Flood Alleviation Scheme' action could have a positive effect on all SEA objectives by improving flood management in the locality. The scheme could be designed with biodiversity in mind and incorporate natural flood management techniques, which could also enhance local water quality by improving filtration processes. By alleviating the potential impacts of flooding, local natural resources could gain improved protection, and this action could also enhance local climate resilience. Furthermore, due to the alleviated flood risk, the mental and physical health of residents could be improved, as could the protection of the local townscape.
	Protection	Property Flood Resilience	Seek opportunities to utilise Property Flood Resilience with Welsh Government funding.	+/-	+/-	+/-	+/-	+	+/-	
			Longevity	S-L	S-L	S-L	S-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	H	M	M	M	H	
		Flood Alleviation Scheme	Ferry Road FAS	+	+	+	+	+	+	
			Longevity	S-L	S-L	S-L	S-L	L	S-L	

			Description	SEA Objective						Appraisal and Recommendations
Community	Action Type	Potential Action		1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Reversibility	R	R	R	R	R	R	Community engagement and facilitating local flood risk action/ awareness groups could benefit all SEA objectives by enhancing public engagement and knowledge-sharing, helping communities take ownership of flood resilience efforts. These groups have the potential to advocate for sustainable drainage solutions and other flood management methods which could support water quality, biodiversity, and climate resilience and population wellbeing. Furthermore, these engagement sessions could aid in the education of local residents relating to individual property level interventions, potentially reducing the risks of altering the local landscape and preventing negative effects to SEA Objective 6. The 'Sourcing Funding' action has the potential to have a positive effect on all SEA objectives if the funding is successfully obtained. This is due to more funding allowing for CCC to continue its business case, evaluation, and optioneering works, which could help to reduce the adverse impacts of flooding in Kidwelly into the future and improve general flood management. **Recommendation**: Ensure asset management and maintenance for key assets includes ecological considerations in drainage or infrastructure upkeep to protect and enhance biodiversity.
			Certainty	M	M	M	M	M	M	
	Preparedness	Community Work	Continue to support the community flood group.	+	+	+	+	+	+	
			Longevity	M-L	S-L	M-L	S-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
	Review	Sourcing Funding	Bid for WG funding to progress business case and evaluation of risk and options. If successful with WG grant bids, CCC can continue its business case, evaluation and optioneering works.	+	+	+	+	+	+	**Recommendation:** Ensure the retrofit of SuDS targets key flood receptors to maximise benefits for the community. **Recommendation**: Combine SuDS with public resources/ spaces such as recreational areas for a broader impact on the community. **Recommendation:** Create opportunities for schools to engage in restoration activities considering the risk of flooding in their local area. **Recommendation**: Offer public education on the proper use and maintenance of property flood resilience to maximise the benefits and minimise any potential negative impacts on the townscape and natural environment. **Recommendation**: Ensure that where property level interventions are implemented, the surroundings of the property are taken into consideration. It is also recommended to ensure that property level interventions don't exacerbate flooding impacts elsewhere or on properties which have lesser protection. **Recommendation:** During community engagement, facilitate discussion and knowledge sharing of the local area and sustainable flood management techniques to develop local understanding of flood management and potentially implement shared ideas.
			Longevity	S-L	S-L	S-L	S-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Gorslas	Prevention	Retrofit SuDS	Look for opportunities to fund and work in collaboration with partners to retrofit SuDS in street scape to reduce runoff and provide attenuation.	+	+	++	+	+	+	Gorslas is a fast developing urban and business area off the A40 – a strategically important area. It is a high point with high annual rainfall, and it is adjacent to the Crosshands community in the Loughor Amman catchment. The 'Retrofit SuDS' action would be expected to reduce flood risk and provide benefits to the wellbeing of the population, biodiversity, natural resources, key receptors and climate resilience through the reduction of runoff and potential to include enhancements to green and blue infrastructure in the locality. This less intrusive action could also aid in the protection of the townscape and can offer further opportunities for residents to engage with nature. SuDS also have the potential to significantly enhance water quality by filtering pollutants from run-off. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the creation resilient landscapes that better manage flood risk sustainably, potentially benefitting all SEA objectives. Air quality could also be improved through natural flood management techniques such as strategic planting, which could be designed to maximise this potential. This action would also have the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing and adaptation to climate change with non-invasive flood management strategies to reduce the probability of out of bank flooding.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
	Prevention	Natural Flood Management	Explore Natural Flood Management solutions and funding options within this area to reduce probability of out of bank flooding.	+	+	+	+	+	+	
			Longevity	S-L	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	M	M	M	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Certainty	M	L	H	M	M	M	**Recommendation:** The retrofit of SuDS can enhance the water retention and management capabilities within present green spaces such as Gorslas park, reducing flood risk within Gorslas centre. **Recommendation:** Retrofit existing paved surfaces with permeable options to reduce runoff without significantly altering the townscape. **Recommendations:** Natural Flood Management measures, such as wetlands, should consider the integration of ways in which the community could benefit.

3 Llanelli

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Llanelli	Prevention	Asset Management & Maintenance	Continue works at Trebeddrod Reservoir	+	+	+	+	+	+	Llanelli has a dense urbanised population at risk of flooding. Four main rivers, plus ordinary watercourses, reservoirs, and waterbodies play a role in flood risk to this community. The 'Asset Management and Maintenance' actions have the potential to improve flood and water management in Llanelli by enhancing the understanding, inspection, and ongoing maintenance of local assets and receptors—such as Trebeddrod Reservoir and Sandy Road. Seeking to strengthen knowledge and stewardship of these key sites could support future climate resilience and provide greater protection for biodiversity, natural resources, water quality, human health, and the townscape, all without the need for new flood management infrastructure. By improving local collaboration with residents in Llanelli, the action to work with residents who have private surface water systems could have the potential to positively affect all SEA objectives. This facilitation of collaboration could promote more effective and efficient water and flood management in Llanelli and maximise the potential of private flood mitigation assets.
			Longevity	M-L	M-L	M	M	L	S-M	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
	Preparedness	Asset Management & Maintenance	Sandy Road CCTV	+	+	+	+	+	+	
			Longevity	M-L	M-L	M	M	L	S-M	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
		Flood Forecasting & Emergency Response	Work with residents who have private surface water systems (Penywern)	+	+	+	+	+	+	
			Longevity	S-L	S-L	S-L	S-L	S-L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
			Seek to remove the Dafen Crossing trash screen	+/-	+/-	+/-	+/-	+/-	+/-	
			Longevity	S-L	S-L	S-L	S-L	S-L	S-L	
			Reversibility	R	R	R	R	R	R	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Certainty	L	L	L	L	L	L	More detail is required to accurately assess the action to 'Seek to remove the Dafen crossing trash screen'. This action has the potential to benefit or have a negative effect on all SEA objectives. The trash screen has the potential to overspill waste into surrounding areas, possibly harming local biodiversity and water quality. The removal of this screen could prevent this waste spillage; however, the watercourse would retain waste if no further mitigations are made, potentially harming biodiversity and water quality. These juxtaposing effects could also be seen with natural resources and the local landscape, with the action potentially benefitting or harming these objectives dependant on the mitigations put into effect. If this action successfully reduces flood risk, it could benefit all SEA objectives. The 'Review' actions have the potential to positively benefit all SEA objectives. Seeking funding to complete the Penyfan FAS could have a positive effect on all SEA objectives by improving flood management in the locality. The scheme could be designed with biodiversity in mind and incorporate natural flood management techniques, which could also enhance local water quality by improving filtration processes. By alleviating the potential impacts of flooding, local natural resources could gain improved protection, and this action could also enhance local climate resilience. Furthermore, due to the alleviated flood risk, the mental and physical health of residents could be improved, as could the protection of the local townscape. This can
	Review	Partnership Work	Seek WG funding to complete the Penyfan FAS	+	+	+	+	+	+	
			Longevity	S-L	S-L	S-L	S-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
			Support NRW and NR in driving forward a solution on the river Dafen	+	+	+	+	+	+	
			Longevity	S-L	S-L	S-L	S-L	S-L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
			Work in partnership with CCC Economic Development to ensure that flood risk management measures are incorporated into any town centre initiatives.	+	+	+	+	+	+	
			Longevity	S-L	S-L	S-L	S-L	S-L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
			Work in partnership with Economic Development and Property to see if there is funding to manage the flood risk at Trostre Business Park	+	+	+	+	+	+	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	S-L	S-L	S-L	S-L	S-L	also be seen with the action to secure funding to manage flood risk at Trostre Business Park. Additionally, the action to drive forward a solution on the river Dafen could help to reduce flood risk in Llanelli by mitigating one of the key contributors to flood risk in the community. Finally, collaborating with CCC to integrate flood risk management measures into future town centre initiatives could support all SEA objectives. This approach would ensure that flood management remains a local priority and is consistently considered in future development planning. **Recommendations:** Facilitate collaboration with further organisations alongside DCWW to maximise the understanding of the current risks and assets and the potential of future flood management. **Recommendation:** Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. Recommendations: To provide more detail on the removal of the Dafen Crossing trash screen.
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
San dy	Prev enti	Natu ral Flo	Seek opportunities for NFM techniques in upper	++	+	++	+	+	+	A western suburb of Llanelli home to historical flooding, particularly for Stepney Road properties.

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			catchment which could reduce peak flows and reduce pressure downstream							The proposed 'Natural Flood Management' action is expected to benefit all SEA objectives, reducing the risk of flooding while potentially offering significant enhancements to water quality and biodiversity. This action also has the potential to protect natural resources, enhance future adaptability to climate change in a sustainable, non-invasive manner, and reduce the risk to population wellbeing. The 'Hard Engineering' action has the potential to significantly benefit human health and wellbeing due to it seeking to target the local at-risk properties of Stepney Road, which could also offer protection to local water quality and natural resources dependent on how existing defences are developed. However, the proposition to increase the scale of existing flood defences demonstrates hard engineering's lack of sustainability, suggesting it to be lacking the potential to adapt to the risks of climate change in the future. This action also risks further alteration to the locality's historic environment and townscape and has the potential to negatively affect biodiversity and natural resources during construction. **Recommendation:** Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible. Explore the possibility of implementing green infrastructure or natural flood management alongside
			Longevity	S-L	M	M	M	L	S	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	M	M	M	
		Hard Engineering	Increase scale of existing NRW defences to protect at risk properties	+/-	++	+	+/-	-	-	
			Longevity	S-L	S	M-L	M-L	L	S-L	
			Reversibility	R	IR	IR	IR	R	IR	
			Certainty	H	H	H	H	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										hard engineering to reduce reliance on invasive measures. **Recommendation:** Consider the use of SuDS and other Natural Flood Management techniques surrounding the at-risk properties to reduce flood risk sustainably, rather than increasing the scale of hard engineering in the locality. **Recommendation:** Natural Flood Management measures should consider the integration of ways in which the community benefit, such as walkways.
Furnace and the Cille Catchment	Protection	Asset management and Maintenance	Create asset management plans for key assets and carry out regular inspection and maintenance	+	+	+	+	+	+	Furnace is a village near the town of Llanelli, named after the historical landmark 'Raby's Furnace'. The area has a moderate risk of surface water flooding, and has several key receptors including Raby's Furnace, the Dam above, Pentrepoeth Field (Parks and Gardens), a major road network (A484), and a residential area (Park y Strade). The 'Asset Management and Maintenance' and 'Natural Flood Management' actions within the catchment could enable a holistic approach to flood management, which could lead to positive effects against all SEA objectives. Furthermore, the 'Natural flood management' action has the potential to significantly benefit biodiversity and water quality through enhanced sustainable flood and water management while considering the natural environment. The 'Property Flood Resilience' action could enhance the protection of properties and key residential receptors at risk of surface water flooding. The action
			Longevity	M-L	M-L	M	M	L	S-M	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
	Prevention	Natural Flood Management	Seek opportunities for Natural Flood Management techniques in upper catchment which could reduce peak flows and reduce pressure downstream	++	+	++	+	+	+	
			Longevity	S-L	M	M	M	L	S	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	M	M	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
		Flood Forecasting and Emergency Response	Support NRW in ensuring that all at risk residents are signed up to flood warnings.	0	+	0	0	+	0	could enhance the wellbeing of the population, protecting physical health, and reducing stress from flood risk. However, dependent on the scale of property measures promoted and their potential locations, this strategy could lead to an increased negative effect for other residents- who may not have the resources to implement such measures- and the surrounding locality, leading to positive or negative effects for biodiversity, health and wellbeing, water quality, natural resources, and the townscape depending on how this action is conducted. The 'Flood Forecasting and Emergency Response' action could positively impact local health and wellbeing by ensuring at-risk residents are signed up to warning systems, helping to reduce the risk of physical harm during flood events. Early warnings may also ease flood-related stress and anxiety, supporting better mental health outcomes. Additionally, by enhancing the effectiveness of emergency responses through improved forecasting, this action could support local climate adaptation and resilience in the face of future flooding. **Recommendation**: Maximise the potential for natural flood management in the upper catchment to enhance biodiversity, particularly if there is a focus on hard engineering and property flood resilience in Furnace. This can be achieved through tree planting and wetland creation amongst other means. **Recommendation**: Promote the use of sustainable, nature-based techniques to property flood management
			Longevity	N/A	S	N/A	N/A	S-L	N/A	
			Reversibility	N/A	R	N/A	N/A	R	N/A	
			Certainty	N/A	H	N/A	N/A	M	N/A	
	Preparedness	Property Flood Resilience	Seek opportunities to promote Property Flood Resilience technologies and techniques to make residents aware of flooding.	+/-	+/-	+/-	+/-	+	+/-	
			Longevity	M	S-L	M-L	M-L	L	S	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	L	L	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										to reduce the stress of flood risk while providing education on the benefits of nature-based solutions. This has the potential to be effective into the future, increasing the potential for the locality to adapt to future flood risk. **Recommendation:** Monitor the effectiveness of nature-based solutions and hard engineering strategies to gauge their potential to withstand future flood risk. **Recommendation:** Alongside the flood warning system for at-risk residents, the locality could offer community drills and education sessions to maximise the potential of this action.
Llanelli Town Centre	Prevention	Sustainable and Strategic Development Planning	Ensure all new development is compliant with planning policy and that SuDS are implemented to manage runoff at source.	+	+	+	+	+	+	The town centre of Llanelli is predominantly made up of mixed retail areas and has recently undergone moderate regeneration. The preventative actions are expected to have benefits to all SEA objectives by improving flood management within and around Llanelli Town Centre. By incorporating climate projections into planning and helping the water network to adapt to climate change, the 'Retrofit SuDS' action could work in partnership with sustainable and strategic development planning, both having the potential to create lasting benefits to flood risk in Llanelli into the future. This could also ensure that new assets are designed to handle increased flooding. Strategic planning may also allow for renewable energy generation from water, while SuDS can also enhance water quality, urban
			Longevity	S-L	L	S-L	S-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	M	M	
		Retrofit SuDS	Seek opportunities to retrofit SuDS in urban environment to reduce runoff and provide attenuation.	+	+	+	+	+	+	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	biodiversity and create further opportunities for residents to engage with nature within the centre.
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
		Flood forecasting and emergency response	Support NRW in ensuring that all at risk residents are signed up to flood warnings.	0	+	0	0	+	0	The 'Property Flood Resilience' action could enhance the protection of properties and key residential receptors at risk of surface water flooding. This action could enhance the wellbeing of the population, protecting physical health, and reduce stress from flood risk. However, dependent on the scale of property measures promoted and their potential locations, this strategy could lead to an increased negative effect for other residents- who may not have the resources to implement such measures- and the surrounding locality, leading to positive or negative effects for biodiversity, health and wellbeing, water quality, natural resources, and the townscape depending on how this action is conducted.
			Longevity	N/A	M-L	N/A	N/A	L	N/A	
			Reversibility	N/A	R	N/A	N/A	R	N/A	
			Certainty	N/A	M	N/A	N/A	M	N/A	
	Preparedness	Property Flood Resilience	Seek opportunities to promote Property Flood Resilience technologies and techniques to make public aware of flooding.	+/-	+/-	+/-	+/-	+	+/-	
			Longevity	S-L	S-L	M	M	L	S	The 'Flood Forecasting and Emergency Response' action could positively impact local health and wellbeing by ensuring at-risk residents are signed up to warning systems, helping to reduce the risk of physical harm during flood events. Early warnings may also ease flood-related stress and anxiety, supporting better mental health outcomes. Additionally, by enhancing the effectiveness of emergency responses through improved forecasting, this action could support local climate adaptation and resilience in the face of future flooding **Recommendation:** Incorporate sustainable and strategic development planning and SuDS into the
			Reversibility	R	R	R	R	R	R	
			H/M/L	L	H	M	L	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										public promotion of property flood resilience in attempt to mitigate any of its potential negative effects and maximise its positive effects. **Recommendation:** Catchment wide natural flood management measures should consider the water quality, air, and soil quality/quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** The enhancement of biodiversity should be considered as part of all actions. **Recommendation**: Alongside the flood warning system for at-risk residents, the locality could offer community drills and education sessions to maximise the potential of this action.
Trostre Industrial Estate	Preparedness	Property Flood Resilience	Seek opportunities to promote Property Flood Resilience technologies and techniques to make public aware of flooding.	+/-	+/-	+/-	+/-	+	+/-	Trostre is a business and retail area east of Llanelli town centre. The area has historically experienced issues with local drainage caused by elevated water levels in the Dafen river. This has resulted in instances of surface water and sewer flooding. Elevated water levels in the Dafen river have been influenced by a throttling effect of railway embankment culverting and/or tide locking. The preventative methods are expected to have benefits against all SEA objectives by improving water management within Trostre and in the upper catchment. The 'Retrofit SuDS' action could enhance water quality, biodiversity, and ecological connectivity in
			Longevity	S-L	S-L	M	M	L	S	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	L	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
	Protection	Hard engineering	Support NRW in their work to reduce pressure and impact of rail culvert throttle.	+/-	+	+	+/-	+	+/-	Trostre whilst protecting against flood risk and would have minimal visual influence upon the townscape. By utilising sustainable techniques to manage flooding, which may include measures such as reforestation and improving soil structure, the 'Natural Flood Management' action could significantly enhance biodiversity and water quality while reducing peak flows, preventing pollution, and creating resilient landscapes that better manage flood risk sustainably.
			Longevity	S-L	S	M	M	L	S	
			Reversibility	R	IR	IR	IR	IR	IR	
			Certainty	H	M	M	M	M	H	
	Prevention	Retrofit SuDS	Seek opportunities to retrofit SuDS in urban environment to reduce runoff and provide attenuation.	+	+	+	+	+	+	The 'Property Flood Resilience' action could enhance the protection of properties and key residential receptors at risk of surface water flooding. This action could also enhance the wellbeing of the population, protecting physical health, and reduce stress from flood risk. However, dependent on the scale of property measures promoted and their potential locations, this strategy could lead to an increased negative effect for other residents- who may not have the resources to implement such measures- and the surrounding locality, leading to positive or negative effects for biodiversity, health and wellbeing, water quality, natural resources, and the townscape depending on how this action is conducted.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
	Prevention	Natural Flood Management	Seek opportunities for natural Flood Management techniques in upper catchment could reduce peak flows and reduce pressure downstream	++	+	++	+	+	+	
			Longevity	S-L	S-M	M	M	L	S-L	The 'Hard Engineering' action to mitigate the elevated water levels of the Dafen river could have broad benefits for Trostre by mitigating the cause of their historic flooding. However, this action may also result in invasive and damaging construction works with the potential for adverse impacts upon biodiversity, natural resources, and landscape considerations.
			Reversibility	R	R	R	R	R	R	
			Certainty	H	L	M	H	M	M	
	Review	Partner ship Work	Work in partnership with NRW and Network Rail to transfer the ownership and	+/-	+/-	+/-	+/-	+/-	+/-	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			responsibility of the River Dafen trash screen or remove accordingly.							The 'Partnership Work' action has the potential to have a positive or negative effect on all objectives due to the uncertainty of how the Dafen trash screen will be managed or removed. Further detail is required to make an accurate assessment of the potential outcomes. However, the trash screen could currently have the potential to overspill waste into surrounding areas, possibly harming local biodiversity and water quality. The removal of this screen could prevent this waste spillage; however, the watercourse would retain waste if no further mitigations were made, potentially harming biodiversity and water quality. These juxtaposing effects could also be seen with all other objectives, with the action potentially benefitting or harming them dependant on the mitigations put into effect. If this action successfully reduces flood risk, it could benefit all SEA objectives. **Recommendation:** Natural flood management measures should consider the integration of ways in which the community benefit, such as walkways. **Recommendation:** Catchment wide flood alleviation measures could consider the water, soil, and air quality issues in the area and seek to include water improvement measures as part of designs. **Recommendation:** Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual
			Longevity	S-L	S-L	S-L	S-L	S-L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										property level measures, to ensure that flood risk is not exacerbated elsewhere. **Recommendation**: Implement SuDS features that also improve public spaces. **Recommendation:** The enhancement of biodiversity should be considered as part of all actions. **Recommendation:** To provide more detail on the removal of the Dafen Crossing trash screen.
Dafen	Protection	Catchment Scale Flood Alleviation Schemes	Complete Heol Buckley works	+	+	+	+	+	+	Dafen is a predominantly rural community with sub-urban residential centres/ villages. It includes industrial and business areas which benefit from road infrastructure. The community area includes Upper and Lower Lliedi Reservoirs, and there have been historical instances of flooding. A significant flooding event occurred in 2008, and there have been mitigation works done on assets in the past. The proposed catchment-scale flood alleviation scheme could take a holistic approach to flood risk management, addressing issues at their source rather than just at flood prone areas. By restoring natural flow pathways, creating attenuation areas, and possibly implementing further Natural Flood Management techniques, these schemes have the potential to support climate adaptation and significantly enhance biodiversity and water quality. This action could also have the potential to protect natural resources, the townscape and historical landscape, and contribute to improved population wellbeing. However, more detail is
			Longevity	M	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	L	L	L	M	L	
		Asset Management & Maintenance	Asset Management Plans, further investigation of CCC assets/ CCTV works to better understand ownership and inspection and maintenance regime. Collaborate with residents in Swiss Valley to manage private drainage.	+	+	+	+	+	+	
			Longevity	M-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Certainty	M	L	M	M	M	M	required surrounding the works at Heol Buckley for a more accurate assessment. The 'Asset Management & Maintenance' action with the facilitation of a better understanding of how assets should be maintained has the potential to improve flood management within Dafen. This improved understanding and management could allow for future resilience to climate change and offer better protection to biodiversity, water quality, natural assets, human health, and the townscape without introducing new flood management infrastructure. The 'Hard Engineering' action has the potential to enhance human health, water quality, and the protection of natural assets. However, the construction of said defence action may negatively impact local biodiversity, natural resources, and may not withstand future risks unless adequate consideration over its construction and long-term effectiveness is facilitated. The introduction of new defences may also negatively affect the natural landscape and townscape, neutralising some potential benefits of the proposed asset management and maintenance action. The 'Natural Flood Management' action could reduce peak flows and flood risk of Dafen, protect water quality, and create resilient landscapes that better manage flood risk sustainably, enhancing all SEA objectives **Recommendation**: Consider the enhancement of existing flood defences and assets before implementing new defence schemes. It is recommended to only
		Hard Engineering	Support NRW if they were to explore a flood defence scheme on Lliedi could alleviate flood risk to properties (and downstream)	+/-	+	+	+/-	+/-	-	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	IR	IR	IR	R	IR	
			Certainty	H	H	M	H	M	H	
		Natural Flood Management	Seek opportunities to explore Natural Flood Management techniques in upper catchment of the river Dafen could reduce peak flows and reduce pressure downstream.	+	+	+	+	+	+	
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	M	M	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										utilise hard engineering if the existing assets and their improved maintenance/management is not deemed adequate for future flood risk. **Recommendation:** Natural flood management measures should consider the integration of ways in which the community benefit, such as walkways. **Recommendation:** Catchment wide flood alleviation measures could consider the water, soil, and air quality issues in the area and seek to include improvement measures as part of designs. **Recommendation:** The enhancement of biodiversity should be considered as part of all actions. **Recommendation:** Consider the integration of Green and Blue infrastructure and SuDS to function collaboratively to current flood defences in Dafen. This can provide a holistic approach to flood management and reduce the need for hard engineering. **Recommendation**: More details surrounding the catchment flood alleviation scheme works at Heol Buckley
Llwynhendy	Protection	Retrofit SuDS	Seek opportunities to retrofit SuDS in urban environment to reduce runoff and provide attenuation. Properties at Bryn Rhos /Brynawelon could benefit as well as Cwmfelin Road. Large areas of hardstanding at stadium and business park could also benefit from retro fit and be showcased to public.	+	+	+	+	+	+	Llwynhendy is an urban residential area to the east of Llaneli town centre. It includes a blend of major industrial infrastructure and high value environmental land. A large coastal plain is located here, which is predominantly at risk of tidal or sea flooding and houses a large tin plate works and railway infrastructure. This community has a large number of CCC assets which includes housing, school, and recreational land, and also includes farms and commercial business land. To the north there is a large residential area, which experiences minor flooding.

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	Additional, new, housing is planned for development. This area also has poor drainage capability. The 'Retrofit of SuDS' action has high potential to sustainably manage flood risk in Llwynhendy by enhancing drainage throughout its built areas, targeting a key risk in the locality. This could allow for the protection of its industrial and residential assets while refraining from any potential negative effects to the high value environmental land. This action is likely to protect and enhance all SEA objectives. Furthermore, the 'Asset Management & Maintenance' action has the potential to enhance flood management into the future by facilitating a greater understanding of current assets and how they are managed, allowing for the development of a sustainable flood management strategy for Llwynhendy. This is of importance due to the volume of assets and high value environmental land in the locality. This action could also prevent the integration of new infrastructure into the landscape, which should be avoided due to the major industrial infrastructure already in place. This action has the potential to protect and enhance effects against all SEA objectives. **Recommendation:** Implement SuDS features that also improve public spaces **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** The enhancement of biodiversity should be considered as part of all actions.
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
	Prevention	Asset Management & Maintenance	Improve knowledge of assets in this community and create asset management and maintenance schedules. Work with DCWW to investigate surface water and foul sewage linkages.	+	+	+	+	+	+	
			Longevity	M	M-L	M	M	L	M	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	H	H	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Utilise climate change models to predict future flood risks and ensure maintenance plans address the evolving threat. **Recommendation:** Facilitate collaboration with further organisations alongside DCWW to maximise the understanding of the current risks and assets and the potential of future flood management. **Recommendation:** Use historical flood data and climate change projections to inform maintenance strategies.

4 Loughor Amman

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Tir Y Dail and Gwyn Fryn Estate	Protection	Property Flood Resilience	Seek opportunities to empower local residents to improve resilience to flooding through property level resilience measures.	+.-	+/-	+/-	+/-	+	+/-	Tir Y Dail and Gwyn Fryn Estate is an area to the north of Ammanford, predominantly at fluvial risk where three main rivers meet. The 'Property Flood Resilience' action has the potential to improve the mental and physical wellbeing of residents within this locality. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness
			Longevity	S-L	S	M	M	S-L	S	
			Reversibility	R	R	R	R	R	R	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Certainty	L	H	M	M	M	H	and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, erosion, alteration to the townscape, and negative effects on biodiversity and water quality. This could also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. Collaboration with local residents to identify key receptors and assess their specific flood risks as outlined in the 'Asset Management & Maintenance' action could help to mitigate flooding in this locality by supporting the area's adaptation to climate change. By ensuring that infrastructure is designed and maintained to withstand increased flooding, this strategic approach has the potential to create new opportunities for water management and lead to benefits against all SEA objectives. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere. **Recommendation:** The establishment of a local volunteering monitoring network could enhance the monitoring of local assets and flood risk within North Ammanford.
		Asset Management and Maintenance	Work with local residents to establish location of key assets on ordinary watercourses and establish maintenance and monitoring plan.	+	+	+	+	+	+	
			Longevity	M	S	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	H	M	M	M	M	
Ammanfor	Prevention	Retrofit SuDS	Retrofit of SuDS in urban environment to reduce runoff and provide attenuation e.g	+	+	+	+	+	+	Ammanford Town Centre is characterised by surface water flood risk associated with overland flow routes and ordinary watercourses.

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Margaret Street / Iscennon Road.							Key receptors include, Ammanford Railway Station and railway line, Main Roads (A474, A483), Ammanford Social Activities Centre, schools, and Town Hall. The 'Retrofit of SuDS' action would have the potential to alleviate flooding in Ammanford Town Centre by enhancing the management of one of the localities' key contributors to flooding, overland flow. This action could reduce the area's risk of flooding without compromising the townscape, subsequently enhancing biodiversity, the wellbeing of the population, water quality, the protection of natural resources, and climate resilience. The 'Asset Management & Maintenance' action could help to mitigate flooding in Ammanford Town Centre by supporting the area's adaptation to climate change. The protection of key receptors such as schools and the town hall could also enhance the wellbeing of the local population and protect the historic environment. By ensuring that infrastructure is designed to withstand increased flooding, this strategic approach can also create new opportunities for water management, and offer opportunities to lead to the enhancement of beneficial effects against all SEA objectives The 'Property Flood Resilience' action has the potential to improve the mental and physical wellbeing of residents in Ammanford Town Centre. While empowering residents to implement property-level flooding measures can protect individual properties and increase climate resilience, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, erosion, alteration to the
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
		Asset Management & Maintenance	Work with local residents to establish location of key assets on ordinary watercourses and establish maintenance and monitoring plan.	+	+	+	+	+	+	
			Longevity	M-L	S-M	M-L	M-L	L	M	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	M	L	L	L	L	
	Protection	Property Flood Resilience	Seek opportunities to empower local residents to improve resilience to flooding through property level resilience measures.	-	+/-	-	-	+	+/-	
			Longevity	S-L	S	M	M	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	H	M	M	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere. **Recommendation:** The establishment of a local volunteering monitoring network could enhance the monitoring of local assets and flood risk within Ammanford. **Recommendation:** Ensure the retrofit of SuDS targets key flood receptors to maximise benefits for the community. **Recommendation:** Combine SuDS with public resources/ spaces such as recreational areas for a broader impact on the community. **Recommendation:** Catchment wide flood alleviation measures could consider the air quality issues in the area and seek to include air quality improvement measures as part of designs.
Brynamman	Prevention	Retrofit of SuDS	Seek opportunities to retrofit SuDS in urban environment to reduce runoff and provide attenuation e.g Cwmgarw Road, Mountain Road, Station Road.	+	+	+	+	+	+	A former mining community. Brynamman receives a high average annual rainfall placing it among the wetter areas both locally within Carmarthenshire and nationally in Wales. The region's topography and proximity to the Black Mountains contribute significantly to its high precipitation levels and surface water flood risk. The community experiences ad-hoc issues relating to drainage.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Reversibility	R	R	R	R	R	R	Key receptors include Main Roads (A4069, A4069) and Brynamman Public Hall Cinema. The 'Natural Flood Management' action has the potential to lead to benefits against all SEA objectives and enable a holistic approach to flood management while enhancing how the locality can adapt to climate change. These techniques would also allow for the protection of the historical landscape in the area without compromising its heritage value. Furthermore, this strategy has the potential to contribute to the sustainable use of water and protect the pollution of water resources via improved flood mitigation. The 'Asset Management and Maintenance' action has the potential to enhance flood and water management within Brynamman through the continued maintenance and inspection of assets and receptors in the locality. This improved understanding and management could offer benefits to all SEA objectives without introducing new flood management infrastructure. The 'Property Flood Resilience' action could have the potential to improve mental and physical wellbeing of residents within Brynamman and improve climate resilience. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless
			Certainty	M	L	H	M	M	M	
		Natural Flood Management	Seek opportunities for Natural Flood Management techniques such as gully blocking, bunds or leaky dams on slopes upstream of town could intercept and reduce runoff.	+	+	+	+	+	+	
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Protection	Asset Management and Maintenance	Create asset management plans for key assets and carry out regular inspection and maintenance. Work with riparian owners on Station Road to create maintenance plans on ordinary watercourse.	+	+	+	+	+	+	
			Longevity	M-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	M	H	
		Property Flood Resilience	Seek opportunities to empower local residents to improve resilience to flooding through property level resilience measures.	-	+/-	-	-	+	+/-	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	accommodations are made for those who cannot implement these defences themselves. The 'Retrofit of SuDS' action has the potential to provide benefits to all SEA objectives through the reduction of runoff and possibility to include enhancements to the green and blue infrastructure within the centre as it reduces flood risk. This less intrusive strategy could also aid in the protection of the townscape and offer further opportunities for residents to engage with nature in the centre. SuDS could also enhance water quality by filtering pollutants from run-off. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere. **Recommendation:** The establishment of a local volunteering monitoring network could enhance the monitoring of local assets and flood risk within North Brynamman. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation:** Ensure the retrofit of SuDS targets key flood receptors to maximise benefits for the community. **Recommendation:** Combine SuDS with public resources/ spaces such as recreational areas for a broader impact on the community.
			Reversibility	R	R	R	R	R	R	
			Certainty	M	H	L	L	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Catchment wide flood alleviation measures could consider the air quality issues in the area and seek to include air quality improvement measures as part of designs. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs.
Crosshands	Prevention	Retrofit SuDS	Seek opportunities to retrofit of SuDS in urban environment to reduce runoff and provide attenuation.	+	+	+	+	+	+	Located off the A40 and part of a major trunk road network, Crosshands is a fast developing urban and business area of strategic importance, with significant development undertaken in certain areas since the last FRMP. It includes a high point with significant annual rainfall, and with the exception of the park flooding historically, flooding incidents have been specific drainage or riparian issues. The 'Asset Management and Maintenance' action has the potential to enhance flood and water management in Crosshands through the continued management, inspection, and location of assets and receptors in the locality, alongside targeted management plans for key assets. This improved understanding and management could allow for future resilience to climate change and offer better protection to biodiversity, water quality, natural assets, human health, and the townscape without introducing new flood management infrastructure. This could also ensure future asset management plans are accurate and can best defend Crosshands against the future risks of climate change.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
	Prevention	Hard engineering	Seek opportunities to increase pipe capacity of existing network, potential re-routing and / or de-culverting	-	+	+	-	+	+/-	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										The 'Retrofit of SuDS' action has the potential to provide benefits to the wellbeing of the population, biodiversity, key receptors and adaptation to climate change through methods such as the reduction of runoff and possibility to include enhancements to the green and blue infrastructure within the centre. This less intrusive strategy could also aid in the protection of the townscape and offer further opportunities for residents to engage with nature. Some SuDS measures, such as planting and green roofs, may also have cumulative positive effects to air, soil, and water quality through additional environmental improvements.
			Longevity	S-L	S	M-L	M-L	L	S-L	
			Reversibility	R	IR	IR	IR	R	IR	
			Certainty	H	H	H	H	M	H	
	Prevention/ Protection	Asset Management & Maintenance	Improve understanding of CCC drainage assets (including highways). Maintain and update asset database and create asset management plans for key assets (including the major asset in Crosshands Park) and carry out regular inspection and maintenance.	+	+	+	+	+	+	The 'Hard Engineering' action to increase the pipe capacity of the existing network could have the potential to improve the area's ability to manage flood risk into the future, enhancing the health and wellbeing of the population, water quality, and climate resilience. However, hard engineering strategies and re-routing could have damaging effects on local biodiversity and natural resources whilst negatively affecting the local townscape. **Recommendation:** Create a tiered system where critical infrastructure and receptors such as Crosshands Park receives priority maintenance and investment. **Recommendation:** Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities.
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible. **Recommendation:** Ensure the retrofit of SuDS targets key flood receptors to maximise benefits for the community. **Recommendation:** Combine SuDS with public resources/ spaces such as recreational areas for a broader impact on the community.
Llangennech	Prevention	Property Flood Resilience	Implement the construction stage and PFR associated with the flood evaluation works and business case development over the last 4-years.	-	+/-	-	-	+	+/-	Llangennech is a medium sized town on the south east coast of the county. Llangennech has experienced historical Ordinary Watercourse issues and investment has been made in a bypass culvert and grids and screens. The major flood risk is tidal. More detail is required regarding the Preventive 'Property Flood Resilience' action. However, if property flood resilience is implemented and promoted, this action could have the potential to improve the mental and physical wellbeing of residents within Llangennech and improve climate resilience. However, while implementing property-level flooding measures could protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	H	L	L	M	H	
		Asset Management & Maintenance	Asset management plans for key assets to establish maintenance regimes.	+	+	+	+	+	+	
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
	Protection	Property Flood Resilience	Empower residents to take agency over own flood risk by exploring Property Flood Resilience measures.	-	+/-	-	-	+	+/-	unless accommodations are made for those who cannot implement these defences themselves. This can also be seen with the protection 'Property Flood Resilience' action. The 'Asset Management and Maintenance' action has the potential to enhance flood and water management within Llangennech through the continued maintenance and inspection of key assets and receptors in the locality. This improved understanding and management could offer benefits to all SEA objectives without introducing new flood management infrastructure. Through shared expertise and resources, the partnership working action has the potential to enhance all SEA objectives by fostering joint efforts to reduce flood-related risks from the Afon Morlais. Supporting NRW has the potential to improve flood management within Llangennech, supporting its potential to enhance all SEA objectives. **Recommendation:** Create a tiered system where critical infrastructure and receptors receive priority maintenance and investment. **Recommendation:** Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	H	L	L	M	H	
	Review	Partnership Work	Support NRW in any works they may take to manage the flood risk from the Afon Morlais	+	+	+	+	+	+	
			Longevity	S-L	S-L	S-L	S-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere.
Central Llandybie and the Nant Gwyddfan	Protection	Hard engineering	Support NRW if they were to investigate feasibility of hard engineering solutions such as walls or embankments to mitigate risk from Afon Marlas. Creation of flood storage area upstream of town / railway structure could reduce peak flows through the town.	+/-	+	+	+	+/-	-	Llandybie is a small town on the flood plain of five rivers (2x main river, 3x ordinary watercourse). The river Marlas places high number of properties at risk, and there is a need to better understand the risks posed by surface water. The Flood risk area of Central Llandybie covers properties at risk from flooding from Afon Marlas extending from the north of the community through town and east of the railway line where ordinary watercourse also impacts properties. Key receptors include Llandybie Railway Station, a Main Road (A483), and Llandybie Social Club. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could reduce runoff, prevent pollution, and create resilient landscapes that better manage flood risk sustainably. Air quality may also be improved through natural flood management techniques, such as planting, that could be designed to maximise this potential. This action also has the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing, the historic environment, and adaptation to climate change with non-invasive flood management strategies. The 'Hard Engineering' action has the potential to manage flood risk in the locality, enhancing the
			Longevity	S-L	S	M-L	M-L	L	S-L	
			Reversibility	R	IR	IR	IR	R	IR	
			Certainty	H	H	H	H	M	H	
	Protection	Property Flood Resilience	Empower residents to take agency over own flood risk by exploring Property Flood Resilience measures.	-	+/-	-	-	+	+/-	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	wellbeing of the population and offering protection to natural resources. However, the proposition to implement new flood defences could risk alteration to the locality's historic environment and townscape. Hard engineering can also have damaging effects on local biodiversity and natural resources. The 'Property Flood Resilience' action could have the potential to improve climate resilience and the mental and physical wellbeing of residents within Central Llandybie. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration of the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. The 'Improved Flood Mapping and Modelling' action could allow for future resilience to climate change and offer better protection to biodiversity, water quality, natural assets, human health, and the townscape without introducing new flood management infrastructure. This could also ensure future asset management plans are accurate and can best defend the locality against the future risks of climate change. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	
		Improved flood mapping and modelling	Hydraulic modelling and mapping study could improve understanding of flood risk in this area and interaction of different sources of flood risk.	+	+	+	+	+	+	
			Longevity	M	M-L	M	M	L	M	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	R	R	
	Review	Natural Flood Management	Natural Flood Management techniques in the upper catchment could reduce peak flows and reduce pressure downstream. Wet woodlands / floodplain reconnection upstream of railway structure may provide storage. Interventions on ordinary watercourses within community boundary may	++	+	++	+	+	+	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			provide benefit to slow the flow.							and seek to include improvement measures as part of designs.
			Longevity	S-L	M-L	M-L	M-L	L	M-L	**Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity.
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	**Recommendation:** Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere.
Woodfield Road	Prevention	Asset Management & Maintenance	Investigation into CCC highways and DCWW assets in urban area to determine if improvements could be made. Asset management plans for key assets to establish maintenance regimes.	+	+	+	+	+	+	A residential community on the western side of Llandybie at risk of flooding from ordinary watercourses. Key receptors of West Llandybie include Glanmarlais Care Home, Llandybie Recreational Grounds, and a Main Road (B4556). By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could reduce runoff, prevent pollution, and create resilient landscapes that better manage flood risk sustainably. Air quality may
			Longevity	M	M-L	M-L	M-L	L	S-L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Reversibility	R	R	R	R	R	R	also be improved through natural flood management techniques such as planting, which could be designed to maximise this potential. This action also has the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing, the historical landscape, and adaptation to climate change with non-invasive flood management strategies. By targeting the investigation and management of key receptors within Woodfield Road, the 'Asset Management & Maintenance' action has the potential to reduce flood risk within the locality, mitigate its potential effects, and enhance all SEA objectives. Investigation to determine if improvements can be made to key receptors such as Glanmarlais Care Home and Llandybie Recreational Grounds could improve the wellbeing of the population and ensure future asset management plans are accurate in order to best defend the locality against the future risks of climate change. Improving flood mapping and modelling could also allow for future climate resilience and offer better protection to biodiversity, water quality, natural assets, human health, and the townscape without introducing new flood management infrastructure. The 'Retrofit of SuDS' action has the potential to reduce flood risk and provide benefits to the wellbeing of the population, biodiversity, natural resources, key receptors and climate resilience through the reduction of runoff and potential to include enhancements to green and blue infrastructure in the locality. This less intrusive action could also aid in the protection of the townscape
			Certainty	M	M	M	M	H	H	
		Retrofit SuDS	Retrofit of SuDS in urban area could provide attenuation to reduce impact of surface water flood risk.	+	+	+	+	+	+	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
	Protection	Property Flood Resilience	Empower residents to take agency over own flood risk by exploring Property Flood Resilience measures.	-	+/-	-	-	+	+/-	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	
		Im pro v	Hydraulic modelling and mapping study could improve	+	+	+	+	+	+	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			understanding of flood risk in this area and interaction of different sources of flood risk.							and can offer further opportunities for residents to engage with nature. SuDS also have the potential to enhance water quality by filtering pollutants from run-off. The 'Property Flood Resilience' action has the potential to improve local climate resilience and the mental and physical wellbeing of residents along Woodfield Road. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation:** Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere.
			Longevity	M	M-L	M	M	L	M	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	R	R	
	Review	Natural Flood Management	Natural Flood Management techniques on ordinary watercourse upstream of town may provide attenuation and prevent flooding downstream.	++	+	++	+	+	+	
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Ensure the retrofit of SuDS targets key flood receptors to maximise benefits for the community. **Recommendation:** Combine SuDS with public resources/ spaces such as recreational areas for a broader impact on the community. **Recommendation:** Use historical flood data and climate change projections to inform maintenance strategies.
Glanaman	Protection	Hard engineering	Support NRW if they choose to investigate scope for hard engineering solutions such as barriers and flood walls through urban area adjacent to Afon Amman.	+/-	+	+	+/-	-	-	Glanaman is a former mining community. It features steep sided hills with multiple ordinary watercourses flowing down to a main river, Afon Amman, which flows through town. Urbanisation over time has resulted in streams being culverted. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could reduce runoff, prevent pollution, and create resilient landscapes that better manage flood risk sustainably. Air quality may also be improved through natural flood management techniques, through planting that could be designed to maximise this potential. This action also has the potential to lead to significant positive effects for
			Longevity	S-L	S	M-L	M-L	L	S-L	
			Reversibility	R	IR	IR	IR	R	IR	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Certainty	H	H	H	H	M	H	biodiversity and water quality, and positive effects for population wellbeing, the historic landscape, and adaptation to climate change with non-invasive flood management strategies. The 'Hard Engineering' action has the potential to manage flood risk in Glanaman, enhancing the wellbeing of the population and offering protection to water quality and natural resources. However, the proposition to implement flood defences could risk alteration to the locality's historic environment and townscape. Hard engineering can also have damaging effects on local biodiversity and natural resources during construction and have low adaptability to the future flood risks of climate change. The 'Asset Management and Maintenance' actions have the potential to enhance flood and water management in Glanaman through the enhanced knowledge of and continued maintenance and inspection of assets and receptors in the locality. This improved understanding, management, and review of assets could allow for future climate resilience and offer better protection to biodiversity, natural assets, water quality, human health, and the townscape without introducing new flood management infrastructure, benefitting all SEA objectives. The 'Property Flood Resilience' action has the potential to improve the climate resilience of the locality, and the mental and physical wellbeing of residents within Glanaman. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of
	Protection		Build knowledge of CCC assets and create asset management plans for key assets. Carry out regular inspection and maintenance.	+	+	+	+	+	+	
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	L	L	
	Prevention	Natural Flood Management	Seek opportunities for Natural Flood Management techniques such as leaky dams/gully blocking on upper slopes could attenuate and reduce flood flows reaching town.	++	+	++	+	+	+	
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Pro tec	Pro per	Seek opportunities to empower residents to take agency over	-	+/-	-	-	+	+/-	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			own flood risk by exploring Property Flood Resilience measures.							their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. Through shared expertise and resources, the partnership working action has the potential to enhance all SEA objectives by fostering joint efforts to reduce flood-related risks at Tan Y Gelli. Supporting NRW has the potential to improve flood management within Glanaman, supporting its potential to enhance all SEA objectives. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere. **Recommendation:** Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction. **Recommendation:** Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Collaborate with residents, businesses, and landowners to map undocumented assets and identify recurring issues.
Tan Y Geli SA18	Protection	Hard Engineering	Support NRW in any evaluation of hard engineering solutions such as barriers and flood walls adjacent to Afon Amman could protect community here.	+/-	+	+	+/-	-	-	Tan Y Geli is a small flood risk area on the north bank of Afon Amman with a cluster of at-risk properties. The 'Hard Engineering' action has the potential to manage flood risk in Tan Y Geli, enhancing the wellbeing of the population and offering protection to at-risk properties, water quality and natural resources. However, the possibility to create flood defences such as flood walls could risk alteration to the locality's historic environment and townscape. Hard engineering could also have damaging effects on local biodiversity and natural resources during construction and has low adaptability to the future flood risks of climate change. The 'Property Flood Resilience' action has the potential to improve the climate resilience of the locality, and the
			Longevity	S-L	S	M-L	M-L	L	S-L	
			Reversibility	R	IR	IR	IR	R	IR	
			Certainty	M	M	M	H	M	H	
		Property Flood Resilience	Seek opportunities to empower residents to take agency over own flood risk by exploring Property Flood Resilience measures.	-	+/-	-	-	+	+/-	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	mental and physical wellbeing of residents within Glanaman. While empowering residents to implement property-level flooding measures could protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere. **Recommendation:** Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible.
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	

5 Lower Towy

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Carmarthen	Review	Partnership working	Work with partners to ensure risks are managed. Work with the University to manage surface water from their site.	+	+	+	+	+	+	A large historical town with a population of 15,000. The oldest areas are located above the floodplain, however modern development has encroached into flood risk areas. The town's surface water is predominantly serviced by DCWW's combined system. The area is predominantly at risk of surface water flooding. Through shared expertise and resources, the partnership working action has the potential to enhance all SEA objectives by fostering joint efforts to reduce flood-related risks in Carmarthen. Furthermore, working with the local university has the potential to improve flood management- particularly relating to surface water, which is of high relevance within Carmarthen. This collaborative work could support this action's potential to enhance all SEA objectives. **Recommendations:** Facilitate collaboration with further organisations alongside University to maximise the understanding of current risks and local assets, and the potential of future flood management. **Recommendations:** Foster a long-term relationship with the University, which could enhance future flood resilience in Carmarthen through research and collaborative working.
			Longevity	S-L	S-L	S-L	S-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	L	L	L	L	L	
Carm	Preve	Retrofi	Seek opportunities to Retrofit SuDS around Town Centre/St	+	+	+	+	+	+	Carmarthen is a large historical town, with a population of 15,000.

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Katherine's Shopping Centre area could provide amenity value and other benefits as well as reduce flood risk. Park Terrace properties could benefit from SuDS features at this location.							The oldest areas are located above the flood plain, however modern development has encroached into flood risk areas. The town's surface water is predominately serviced by DCWWs combined system, and Carmarthen North is predominantly at risk of surface water flooding. On the north bank of the Town is Carmarthen Quay – the handful of businesses here flood routinely when the river is higher than 5.7m. Key receptors include Carmarthen Castle, multiple churches, the County Hall, and Main Roads (A4242 Coracle Way, A484, B4312). The 'Retrofit of SuDS' action has the potential to reduce flood risk, runoff, and provide benefits to the wellbeing of the population, biodiversity, key receptors, and climate resilience. It also has the potential to include enhancements to green and blue infrastructure in the locality, potentially enhancing local natural resources. This less intrusive action could also aid in the protection of the townscape and can offer further opportunities for residents to engage with nature. SuDS also have the potential to enhance water quality by filtering pollutants from run-off. The 'Management, inspection and maintenance' action has the potential to enhance water and flood management in Carmarthen town centre through the continued maintenance and inspection of existing flood defences in the locality. This improved understanding and management could allow for future resilience to climate change and offer better protection to biodiversity,
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
		Asset Management and Maintenance	Management, inspection and maintenance of flood defences.	+	+	+	+	+	+	
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
			Work with DCWW and the Highways Authority to develop a surface water sewer map for the area.	+	+	+	+	+	+	
			Longevity	M	M-L	M	M	L	M	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	H	M	M	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
		Hard Engineering	Seek opportunities to work with DCWW and the Highways Authority to evaluate drainage infrastructure. Look at separating surface water and foul sewer networks, increasing pipe capacity.	+/-	+	+	+/-	+	+/-	natural assets, water quality, human health, and the townscape without introducing new flood management infrastructure to the historical town. The action to 'Work with DCWW and the Highways Authority to develop a surface water sewer map for the area' has the potential to sustainably improve water management in Carmarthen town centre. Mapping the sewer system could enhance understanding of how surface water is managed locally, particularly through collaboration with DCWW, the organisation responsible for this infrastructure. This improved knowledge could help reduce flood risk and contribute positively to all SEA objectives. Though the 'Hard engineering' action is an example of hard engineering, improving drainage infrastructure wouldn't have a high potential to disrupt the townscape and historic landscape beyond construction, with benefits to the locality potentially outweighing these short term affects. These proposed actions could have the potential to improve Carmarthen Town Centre's adaptability to future flood risk, improve water quality, protect biodiversity and population wellbeing, reduce the pressure on sewers during heavy rainfall events, increase the climate resilience of the locality, and protect natural assets such as soil. **Recommendation:** Ensure the retrofit of SuDS targets key flood receptors to maximise benefits for the community. **Recommendation**: Combine SuDS with public resources/ spaces such as recreational areas for a broader impact on the community.
			Longevity	S-L	M-L	M	M	L	M	
			Reversibility	IR	IR	IR	IR	IR	IR	
			Certainty	M	L	H	M	L	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible. **Recommendation**: Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Collaborate with residents, businesses, and landowners to map undocumented assets and identify recurring issues. **Recommendation:** Conduct climate vulnerability assessments to determine whether assets and infrastructure can withstand the future risks of climate change. **Recommendation:** Explore green infrastructure to reduce surface water entering the sewer network, minimising overflow risks. **Recommendation:** Reduce reliance on traditional flood management methods such as piping and integrate more SuDS such as permeable paving and rain gardens to slow and filter runoff.
Pensarn Retail	Review	Partnership work	Seek opportunities to work with the CCC Regeneration and Business team and discuss the future of Pensarn Retail Park.	++	++	++	++	++	++	South of Carmarthen town is the railway station and Pensarn retail / business area. This is protected by an NRW flood wall though is at risk of flooding from

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	M-L	M-L	M-L	M-L	L	M-L	overtopping, breach, and surface water becoming trapped. Key receptors in Pensarn include a train station and Carmarthen Delivery Office. Through shared expertise and resources, the partnership working action has the potential to enhance all SEA objectives by fostering joint efforts to reduce flood-related risks in Pensarn Retail Park. Seeking opportunities to work with CCC to discuss the future of the retail park could significantly improve the area's climate adaptability. This collaborative work discussing future improvements and developments has significant potential to enhance how the retail park manages flooding, benefitting all objectives The 'Asset Management & Maintenance' action could help to enhance the effectiveness and longevity of local assets while protecting Pensarn from flooding events, potentially enhancing all SEA objectives. The inspection and maintenance of existing defences could improve population wellbeing by reducing the stress of flooding events and the potential for physical harm, and can protect water quality, natural assets, and built assets within Pensarn, equipping the locality for future climate risk while maintaining the current townscape. **Recommendation**: Any flood risk management measures should be mindful of the potential cultural heritage resources that may be affected by schemes,
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	M	M	
	Prevention/ Protection	Asset Management & Maintenance	Management, inspection and maintenance of flood defences (walls, demountable and embankments) along the River Tywi.	+	+	+	+	+	+	
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										with may include archaeological resources that are yet to be identified. **Recommendation**: Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Collaborate with residents, businesses, landowners and CCC to map undocumented assets and identify recurring issues.

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Johnstown	Prevention	Retrofit SuDS	Provision of SuDS along Old St Clears Road and other clusters of at risk properties could reduce the risk of surface water flooding.	+	+	+	+	+	+	The Tawelan Brook catchment and the village of Johnstown are west of Carmarthen. Johnstown and the area north of the A40 is at risk of tidal, fluvial and pluvial flooding. The 'Retrofit of SuDS' action for Old St Clears Road and at risk properties would be expected to provide benefits to the wellbeing of the population, biodiversity, key receptors and adaptation to climate change through methods such as the reduction of runoff and possibility to include enhancements to green and blue infrastructure as it reduces flood risk. This less intrusive strategy could also aid in the protection of the townscape and can offer further opportunities for residents to engage with nature. Some SuDS measures, such as planting and green roofs, may also have cumulative positive effects which may benefit air, soil and water quality. The action to seek opportunities to work with the University of Wales and the Local Health Board could enhance flood management and the positive effects of SuDS measures throughout Johnstown through shared expertise and resources, potentially having a positive effect on all SEA objectives. This collaborative working could enhance surface water management and benefit wider areas within the locality, which could currently have a cumulative effect on flooding in Johnstown. The 'Asset Management & Maintenance' action could help to enhance the effectiveness, adaptability, and longevity of assets while protecting Johnstown from flooding events, offering the potential to benefit all SEA objectives. The inspection and maintenance of existing
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
			Seek opportunities to work with the University of Wales and the Local Health Board with regards to the management of surface water from their estates	+	+	+	+	+	+	
			Longevity	S-L	S-L	S-L	S-L	S-L	S-L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Reversibility	R	R	R	R	R	R	defences could improve population wellbeing through the reduction of stress and potential for physical harm from flooding events and protect water quality and the natural and built assets within the locality without compromising the historical landscape. **Recommendation:** Design multi-functional SuDS features to improve both flood resilience and public accessibility. **Recommendation**: Any flood risk management measures should be mindful of the potential cultural heritage resources that may be affected by schemes, with may include archaeological resources that are yet to be identified. **Recommendation**: Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities.
			Certainty	L	L	L	L	L	L	
	Prevention/Protection	Asset Management & Maintenance	Management, inspection and maintenance of flood defences (walls, demountable and embankments) along the Tawelan Brook.	+	+	+	+	+	+	
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
Abergwilli	Protection	Asset Management & Maintenance	Support NRW in their management, inspection and maintenance of flood defences (flood gate and embankments) near Lloyds Terrace	+	+	+	+	+	+	Abergwilli is a village outside Carmarthen on the north bank of the Tywi and at the mouth of the Afon Gwili. NRW have major flood defences in this area including specific actions to close flood gates. Key receptors include GlanGwili General Hospital and Tywi Valley path.
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
		Asset Management &	Management, inspection and maintenance of the reservoir and scheme	+	+	+	+	+	+	The 'Retrofit of SuDS' action could have the potential to reduce flood risk and provide benefits to the wellbeing of the population, biodiversity, key receptors and adaptation to climate change through methods such as the reduction of runoff and possibility to include enhancements to the green and blue infrastructure. This less intrusive strategy could also aid in the protection of the townscape and can offer further opportunities for residents to engage with nature. Some SuDS measures, such as planting and green roofs, may also have cumulative positive effects which may benefit air, soil and water quality. The alterations to the hardstanding of the hospital could improve filtration, runoff, and drainage in Abergwilli, and offer increased flood protection to one of its key receptors. The 'Asset Management & Maintenance' actions could help to enhance the effectiveness, adaptability, and longevity of local assets while protecting Abergwilli from flooding events, enhancing all SEA objectives. **Recommendation:** Design multi-functional SuDS features to improve both flood resilience and public accessibility. **Recommendation**: Any flood risk management measures should be mindful of the potential cultural heritage resources that may be affected by schemes, with may include archaeological resources that are yet to be identified. **Recommendation**: Introduce proactive maintenance schedules by implementing routine inspections and maintenance.
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
	Prevention	Retrofit SuDS	Seek opportunities to retrofit SuDS across hardstanding areas of Hospital.	+	+	+	+	+	+	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities.

6 Teifi

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Llandysul	Prevention	Asset Management & Maintenance	Business as usual - Carry out regular inspection and maintenance of existing known assets.	+	+/-	+	+	+	+	Llandysul is a small town to the north of the county at the confluence of the Afon Teifi and Afon Tyweli. Residential areas in Llandysul are predominantly at risk of fluvial flooding. The majority of at-risk properties are clustered around Pont Tyweli. Llandysul was impacted by Storm Callum in 2018. Regular inspection and maintenance of known existing assets, as proposed in the Action Plan, would have the potential to enhance the flood management assets of Llandysul while improving public wellbeing, protecting water quality and natural resources, and future adaptability. This could be achieved through the reduced risk of infrastructure failures, extended lifespan of known assets, and mitigation of threats as they arise. This
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
		Natural Flood Management	Seek opportunities to work with the Nutrient Management Board and use Natural Flood Management techniques such as attenuation basins, wetlands, gully blocking or leaky dams	++	+	++	+	+	+	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	M-L	M-L	M-L	L	M-L	action would focus on maintaining assets already in place, reducing the need for new flood defences which could have the potential to negatively affect the townscape, historical landscape, and biodiversity. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the creation resilient landscapes that better manage flood risk sustainably, potentially benefitting all SEA objectives. Air quality could also be improved through natural flood management techniques, such as strategic planting that could be designed to maximise this potential. This action would also have the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing and adaptation to climate change with non-invasive flood management strategies. Furthermore, techniques such as floodplain reconnection and gully blocking could help trap sediment and pollutants, reducing runoff into local Special Area of Conservation (SAC) rivers and improving water quality. Empowering residents to utilise property level resilience measures would have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Llandysul. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration to the townscape, and negative effects on biodiversity and water quality. This could also increase health
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Prevention	Property Flood Resilience	Subject to WG funding, deliver the programme of Property Flood Resilience to empower residents to manage their flood risk	-	+/-	-	-	+	+/-	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. **Recommendation**: Any flood risk management measures should be mindful of the potential cultural heritage resources that may be affected by schemes, with may include archaeological resources that are yet to be identified. **Recommendation**: Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation:** Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction.
Newcastle Emlyn	Prevention	Retrofit of SuDS	Provision of SuDS along Res y Cawdor / Cawdor Terrace through Town Centre could reduce risk to properties and	+	+	+	+	+	+	Newcastle Emlyn is a small town to the north of the county on the south bank of the Afon Teifi (main river), which is the boundary between Carmarthenshire and Ceredigion. Three ordinary watercourses flow adjacent

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			provide additional amenity benefit. Potential to utilise SuDS within Ysgol Gyfun Emlyn to reduce flows downstream and provide educational showcase.							to the town; Afon Arad to the east, Nant Sarah to the west and an unnamed watercourse adjacent to Quarry Ffinant that has been the subject of recent capital works. Newcastle Emlyn can be prone to flooding during periods of heavy rainfall or when rivers overflow and was impacted by Storm Callum in 2018. This flood risk area is predominantly at risk of surface water flooding as a result of unnamed ordinary watercourse adjacent to Quarry Ffinant arising from higher elevations to the south. The 'Retrofit of SuDS' action could reduce flood risk and provide benefits to the wellbeing of the population, water quality, biodiversity, key receptors and adaptation to climate change through the reduction of runoff and possibility to include enhancements to green and blue infrastructure in the locality. This less intrusive action would also aid in the protection of the townscape and could offer further opportunities for residents to engage with nature. Some SuDS measures, such as planting and green roofs, may also have cumulative positive effects to air, soil and water quality through additional environmental enhancements. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could enable a holistic approach to flood management and aid in the creation resilient landscapes that better manage flood risk sustainably. Air quality could also be improved through natural flood management techniques, such as planting that could be designed to maximise this potential. This action would also have the potential to
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
		Natural Flood Management	Seek opportunities to work with the nutrient management board and use Natural Flood Management techniques.	++	+	++	+	+	+	
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Prevention/ Protection	Asset Management & Maintenance	Continued management, inspection, maintenance of watercourse and associated assets.	+	+	+	+	+	+	
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
	Preparedness	Property Flood	Seek opportunities to promote use of Property Flood Resilience to empower residents to manage their risk of flooding.	-	+/-	-	-	+	-	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	lead to significant positive effects for biodiversity, and positive effects for population wellbeing, the historic landscape, and adaptation to climate change with non-invasive flood management strategies. Significant positive effects would also be expected in relation to improving water quality. The 'Property Flood Resilience' action would have the potential to improve local climate resilience and the mental and physical wellbeing of residents within the locality. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. The 'Asset Management and Maintenance' action would have the potential to enhance the flood management of the locality while improving public wellbeing, future adaptability, and protecting water quality and natural resources. This can be achieved through the decreased risk of infrastructure failures, extended lifespan of known assets, and mitigation of threats as they arise. This action would focus on maintaining assets already in place, reducing the need for new flood defences with the potential to negatively affect the townscape, historical landscape, and biodiversity.
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Design multi-functional SuDS features to improve both flood resilience and public accessibility. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere. **Recommendation:** Any flood risk management measures should be mindful of the potential cultural heritage resources that may be affected by schemes, with may include archaeological resources that are yet to be identified. **Recommendation:** Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation:** Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction.

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Aber Arad	Protection	Property Flood Resilience	Seek opportunities to promote use of Property Flood Resilience to empower residents to manage risk of flooding from Afon Arad.	-	+/-	-	-	+	+/-	This area is predominantly at risk of flooding from the Afon Arad and is located on Heol yr Orsaf / Station Road near Heol Arad. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the creation resilient landscapes that better manage flood risk sustainably. Air quality may also be improved through natural flood management techniques such as planting that could be designed to maximise this potential. This action would also have the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing, the historical landscape, and adaptation to climate change with non-invasive flood management strategies. Furthermore, techniques such as floodplain reconnection and gully blocking can help trap sediment and pollutants, reducing phosphate runoff into SAC rivers. The 'Asset Management & Maintenance' action would have the potential to enhance the flood management of the locality while improving public wellbeing, future adaptability, and protecting water quality and natural resources. This could be achieved through the decreased risk of infrastructure failures, extended lifespan of known assets, and mitigation of threats as they arise. This action would focus on maintaining assets already in place, reducing the need for new flood defences with the potential to negatively affect the townscape, historical landscape, and biodiversity.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	
	Prevention	Natural Flood Management	Seek opportunities to work with the nutrient management board and use Natural Flood Management techniques such as attenuation basins, wetlands, gully blocking or leaky dams on Afon Arad and tributaries upstream of town could provide attenuation to reduce peak flows on watercourse. Other techniques such as buffer strips could reduce flows and phosphate loads affecting Teifi SAC.	++	+	++	+	+	+	
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
	Prevention/ Prevention	Asset Management & Maintenance	Continued management, inspection, maintenance of watercourse and associated assets.	+	+	+	+	+	+	The 'Property Flood Resilience' action would have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Aber Arad. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alterations to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation:** Expand Natural Flood Management interventions where they will have the greatest effect on peak flow reduction. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										property level measures, to ensure that flood risk is not exacerbated elsewhere.
Drefach	Prevention	Natural Flood Management	Seek opportunities to work with the Nutrient Management Board and use Natural Flood Management techniques such as attenuation basins, wetlands, gully blocking or leaky dams to achieve multiple benefits.	++	+	++	+	+	+	Drefach is a hamlet on the Nant Bargoed (main river and a tributary of the Teifi). There is little significant drainage infrastructure present in the community which has been known to flood during periods of heavy rainfall, key receptors include schools and the National Wool Museum. The 'Property Flood Resilience' action would have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Drefach. However, while empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alterations to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the creation resilient landscapes that better manage flood risk sustainably. Air quality and soil stability may also be improved through natural flood management techniques such as planting, which could be designed to maximise this potential. This action would also have the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing, the historical landscape, and adaptation to
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Protection	Property Flood Resilience	Seek opportunities to promote use of Property Flood Resilience to empower residents to manage risk of flooding from Afon Bargoed and tributaries.	-	+/-	-	-	+	-	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	
	Review	Improved flood mapping and	Seek opportunities to improve our understanding of flood risk with flood modelling and telemetry.	+	+	+	+	+	+	
			Longevity	M-L	M	M-L	M-L	L	M	
			Reversibility	R	R	R	R	R	R	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Certainty	M	L	M	M	M	M	climate change with non-invasive flood management strategies. The 'Improved flood mapping and modelling' action would have the potential to enhance flood management in Drefach by providing improved modelling to identify vulnerable areas at risk of flooding, potentially enhancing all SEA objectives. This could allow flood mitigation efforts to focus on key receptors and assets most at risk. More accurate flood modelling also reduces uncertainty, helping communities better prepare for flooding and alleviating stress related to flood risk. Additionally, enhanced data can pinpoint areas where flooding may increase contamination risks, leading to better water management strategies and improved water quality protection. This action would aid in forecasting future flood patterns, ensuring long term resilience. **Recommendation:** The enhancement of biodiversity should be considered as part of all actions. **Recommendation**: Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation:** Public involvement in flood mapping workshops could incorporate local knowledge into modelling and mapping. **Recommendation:** Utilise notification systems such as automatic text alerts or community sirens when flood risks arise.
Cwmann	Prevention/Protection	Asset Management & Maintenance	Business As Usual - Management, inspection and maintenance of existing drainage assets in key risk areas	+	+	+	+	+	+	Cwmann is a small village on the south bank of the Teifi, adjacent to the market town of Lampeter, this location was impacted by Storm Callum in 2018. The 'Hard Engineering' actions have the potential to manage flood risk in Cwmann, enhancing the wellbeing of the population and offering protection to at-risk properties, water quality and natural resources. However, the possibility to construct flood alleviate works could risk alteration to the locality's historic environment and townscape. Hard engineering can also have damaging effects on local biodiversity and natural resources during construction and have low adaptability to the future flood risks of climate change. However, more detail is required to accurately assess the potential effects of upgrading the Cwmann Trash Screen. If this has the potential to enhance flood management in the locality, it has the potential to enhance all SEA objectives, however, dependant on the scale and
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
	Protection	Property Flood	Promote use of Property Flood Resilience to empower residents to manage risk of flooding from Afon Arad.	-	+/-	-	-	+	-	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Reversibility	R	R	R	R	R	R	intrusion of the works, negative effects could be seen on biodiversity, natural resources, and the surrounding landscape. The 'Asset Management & Maintenance' action would have the potential to enhance the flood management of Cwmann while improving public wellbeing, protecting water quality, natural resources, and future adaptability. This could be achieved through the decreased risk of infrastructure failures, extended lifespan of known assets, and mitigation of threats as they arise. This action would focus on maintaining assets already in place, reducing the need for new flood defences with the potential to negatively affect the townscape, historical landscape, and biodiversity. The 'Property Flood Resilience' action would have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Cwmann. While empowering residents to implement property-level flooding measures could protect individual properties, a lack of awareness and consideration of
			Certainty	L	H	M	M	M	H	
		Hard Engineering	Upgrade the Cwmann Trash Screen (subject to grant funding)	+/-	+	+	+/-	+	+/-	
			Longevity	S-L	S	M	M	L	S	
			Reversibility	R	IR	IR	IR	IR	IR	
			Certainty	H	M	M	M	M	H	
			Subject to continued WG funding, complete the detailed design and construction of flood the flood alleviation works at Treherbert Street.	+/-	+	+	+/-	+	+/-	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	S	M	M	L	S	their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. **Recommendation:** Design multi-functional SuDS features to improve both flood resilience and public accessibility. **Recommendation:** Incentivise SuDS adoption as a method of property flood resilience to enhance the wellbeing of the population with less-invasive, sustainable flood management techniques. **Recommendation:** Any flood risk management measures should be mindful of the potential cultural heritage resources that may be affected by schemes, with may include archaeological resources that are yet to be identified. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual
			Reversibility	R	IR	IR	IR	IR	IR	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Certainty	H	M	M	M	M	H	property level measures, to ensure that flood risk is not exacerbated elsewhere. **Recommendation:** Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation**: Provide more detail on the hard engineering action to develop the Cwmann Trash Screen. **Recommendation:** If large scale hard engineering works are necessary, it is recommended to utilise natural flood management techniques where possible and offer mitigation strategies to the potential adverse effects on SEA objectives.
Llanybydder	Prevention/ Protection	Asset Management and Maintenance	Management, inspection and maintenance of existing drainage assets in key risk areas.	+	+	+	+	+	+	Llanybydder is a small town in the north of the county on the south bank of Afon Teifi, it was impacted by Storm Callum in 2018. The Afon Duar (ordinary watercourse) flows to eat of Llanybydder. The 'Asset Management and Maintenance' action would have the potential to enhance the flood management of Llanybydder while improving public wellbeing, protecting water quality, natural resources, and future adaptability. This could be achieved through the decreased risk of infrastructure failures, extended lifespan of known assets, and mitigation of threats as they arise. This action would focus on maintaining assets already in
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
	Prevention	Natural Flood Management	Seek opportunities to work with the Nutrient Management Board and use Natural Flood Management techniques such as attenuation basins, wetlands, gully blocking or leaky dams.	++	+	++	+	+	+	place, reducing the need for new flood defences with the potential to negatively affect the townscape, historical landscape, and biodiversity. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the creation resilient landscapes that better manage flood risk sustainably. Air quality and soil stability may also be improved through natural flood management techniques such as planting, which could be designed to maximise this potential. This action would also have the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing, the historical landscape, and adaptation to climate change with non-invasive flood management strategies. The 'Property Flood Resilience' action would have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Llanybydder. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alteration to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. The 'Retrofit SuDS' action could reduce flood risk and provide benefits to the wellbeing of the population, water
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Protection	Property Flood Resilience	Subject to WG funding, deliver the programme of Property Flood Resilience to empower residents to manage their flood risk	-	+/-	-	-	+	-	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	
		Retrofit SuDS	Deliver the retrofit SuDS project in the village car park	+	+	+	+	+	+	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										quality, biodiversity, key receptors and adaptation to climate change through the reduction of runoff and possibility to include enhancements to green and blue infrastructure in the locality. This less intrusive action would also aid in the protection of the townscape and could offer further opportunities for residents to engage with nature. Some SuDS measures, such as planting and green roofs, may also have cumulative positive effects to air, soil and water quality through additional environmental enhancements. **Recommendation:** Any flood risk management measures should be mindful of the potential cultural heritage resources that may be affected by schemes, with may include archaeological resources that are yet to be identified. **Recommendation:** Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** Design multi-functional SuDS features to improve both flood resilience and public accessibility. **Recommendation:** Incentivise SuDS adoption as a method of property flood resilience to enhance the wellbeing of the population with less-invasive, sustainable flood management techniques.

Community	Action Type	Potential Action	Description	SEA Objectives						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs.

7 Upper Towy

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Llandovery	Prevention/ Protection	Asset Management & Maintenance	Business As Usual: maintenance of fluvial defences in locality, culvert trash screens, channels, gullies.	+	+	+/-	+	+	+	Llandovery is a market town located in the upper catchment of the Afon Tywi river basin district which is predominantly at fluvial flood risk sitting at the confluence of four main rivers. This area benefits from significant NRW defences. The Nant Bawdwr, flows in culverted through the centre of the town and is classed as 'ordinary watercourse' along this reach. Flooding frequently occurs along the A4069 at Llwyn Jac causing the road to close. Key receptors include schools, Llandovery train station, Hospital, and Library. By utilising sustainable techniques to manage flooding, the ‘Natural Flood Management’ action could aid in the
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
	Protection	Hard Engin	Seek opportunities to influence NRW pertaining to the Bawdwr diversion and sluice gate. This	-	+	+	-	-	-	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			would divert more peak flows away from ordinary watercourse culvert through town.							creation of resilient landscapes that better manage flood risk sustainably. Air quality and soil stability may also be improved through natural flood management techniques such as tree planting, that could be designed to maximise this potential. This action also has the potential to lead to significant positive effects for biodiversity, water quality, and positive effects for population wellbeing, the historic landscape, and adaptation to climate change with non-invasive flood management strategies. The 'Property Flood Resilience' action could have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Llandovery. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alterations to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. The 'Asset Management and Maintenance' 'Review' action has the potential to enhance flood management in Llandovery by providing improved modelling and mapping to identify vulnerable areas at risk of flooding, potentially enhancing/protecting all SEA objectives. This could allow flood mitigation efforts to be focused on key receptors and assets most at risk. More accurate flood modelling could reduce uncertainty, helping communities
			Longevity	S-L	S	M-L	M-L	L	S-L	
			Reversibility	R	IR	IR	IR	R	IR	
			Certainty	H	H	H	H	M	H	
	Review	Asset Management and Maintenance	Seek opportunities to work with DCWW and the Highways Authority to collate and map flood risk and drainage assets and undertake improved modelling of Nant Bawdwr. This could be supported through CCTV surveys as well as telemetry gauging to better understand flow regimes and improve accuracy.	+	+	+	+	+	+	
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
	Prevention	Natural Flood	Seek opportunities to work with partner organisations and the Nutrient Management Board for Natural Flood Management techniques such as leaky	++	+	++	+	+	+	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			dams, attenuation areas, wetlands, tree planting in catchments upstream of town may provide attenuation and / or reduce peak flows to prevent flooding downstream.							to better prepare for flooding and alleviating stress related to flood risk. Additionally, enhanced data can pinpoint areas where flooding may increase contamination risks, leading to better water management strategies and improved water quality protection. This action could also aid in forecasting future flood patterns, ensuring long term resilience and protection of the townscape. The 'Hard Engineering' action has the potential to improve flood management in Llandovery, enhancing the wellbeing of the population, built assets, and offering protection to natural resources. However, increasing the flood defences adjacent to main rivers could risk alteration to the natural landscape and disruption to natural river processes. Hard engineering could also have damaging effects on local biodiversity, natural resources and may require ongoing maintenance and extensions into the future, resulting in low adaptability to the future flood risks of climate change. The regular maintenance of known existing fluvial defences in the locality outlined in the Preventive/Protective 'Asset Management & Maintenance' action could have the potential to enhance the flood management of Llandovery while improving public wellbeing, protecting water quality, natural resources, and future adaptability. This can be achieved through the decreased risk of infrastructure failures, extended lifespan of known assets, and mitigation of threats as they arise. This action would focus on maintaining assets already in place, reducing the need for new flood defences with the potential to negatively
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Preparedness	Property Flood Resilience	Seek opportunities to empower residents to take agency over own flood risk by exploring Property Flood Resilience measures.	-	+/-	-	-	+	-	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										affect the townscape, historical landscape, and biodiversity. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation**: Introduce proactive maintenance schedules by implementing routine inspections and maintenance. **Recommendation:** It is recommended that maintenance activities should consider the potential environmental incidental impacts, to ensure that no negative effects arise from these activities. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere. **Recommendation**: Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible.
Llandeilo	Prevention	Retrofit	Seek opportunities to utilise SuDS to reduce runoff and provide attenuation to reduce	+	+	+	+	+	+	Llandeilo is situated at the crossing of the Afon Tywi on the north bank on the A483. The town is served by

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			flood risk and provide amenity benefit.							Llandeilo railway station on the Heart of Wales Line. The historical town sits above the main flood plain of the river and therefore surface water issues are predominant here. The 'Retrofit of SuDS' action would be expected to provide benefits to the wellbeing of the population, biodiversity, key receptors and adaptation to climate change through methods such as the reduction of runoff and supporting existing defences as it reduces flood risk. This less intrusive strategy could also aid in the protection of the townscape and can offer further opportunities for residents to engage with nature. Some SuDS measures, such as planting and green roofs, may also have cumulative positive effects through additional environmental enhancements, which may benefit air, soil and water quality. The 'Asset Management and Maintenance' action could have the potential to enhance flood and water management within Llandeilo through investigative works into water management infrastructure in the locality. This improved understanding and mapping can allow for future resilience to climate change and offer better protection to biodiversity, water quality, natural assets, human health, and the townscape without introducing new flood management infrastructure. Efforts to better understand, identify, and track drainage infrastructure throughout Llandeilo could also contribute to the reduction of flood risk through the enhancement of current flood defences.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
	Prevention/ Protection	Asset Management and Maintenance	Seek opportunities to work with DCWW and the Highways Authority to develop a master drainage map.	+	+	+	+	+	+	
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Design multi-functional SuDS features to improve both flood resilience and public accessibility. **Recommendation:** Incentivise SuDS adoption as a method of property flood resilience to enhance the wellbeing of the population with less-invasive, sustainable flood management techniques. **Recommendation:** Locate and map all drainage infrastructure ensuring an up-to-date database of locations and conditions. This can ensure future asset management plans are accurate and can best defend Llandeilo **Recommendations:** Residents can provide valuable insight into recurring issues such as blocked drains or instances of high run-off. The development of an accessible public reporting system could enhance water management.
Ffairfach	Prevention	Retrofit SuDS	Utilisation of SuDS along Rhosmaen Street could reduce runoff and provide attenuation to reduce risk to properties.	+	+	+	+	+	+	Ffairfach lies on the southern bank of the Tywi and experiences both fluvial and surface water issues. Water from higher land to the south causes surface water and fluvial flooding in Heol Myrddin and across to Bethlehem Road. The 'Retrofit of SuDS' action would be expected to provide benefits to the wellbeing of the population, biodiversity, water quality, key receptors and adaptation
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
	Preparedness	Property Flood Resilience	Empower residents to take agency over own flood risk by exploring Property Flood Resilience measures.	-	+/-	-	-	+	-	to climate change through methods such as the reduction of runoff and supporting existing defences as it reduces flood risk. This less intrusive strategy could also aid in the protection of the townscape and can offer further opportunities for residents to engage with nature. Some SuDS measures, such as planting and green roofs, may also have cumulative positive effects through additional environmental enhancements which may benefit air, soil and water quality The 'Property Flood Resilience' action could have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Ffairfach. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alterations to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. **Recommendation:** Residents can provide valuable insight into recurring issues such as blocked drains or instances of high run-off. The development of an accessible public reporting system could enhance water management. **Recommendation:** Design multi-functional SuDS features to improve both flood resilience and public accessibility.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Incentivise SuDS adoption as a method of property flood resilience to enhance the wellbeing of the population with less-invasive, sustainable flood management techniques. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere.
Llanwrda	Prevention	Natural Flood Management	Seek opportunities to work with the nutrient management board and explore Natural Flood Management techniques such as leaky dams, attenuation areas, wetlands, tree planting in upstream Afon Dulais catchment may provide attenuation and / or reduce peak flows to prevent flooding downstream.	++	+	++	+	+	+	Llanwrda is a hamlet located 5km south and downstream of Llandovery. This area is predominantly at risk of fluvial flooding being situated adjacent to the confluence of the Afan Dulais and Afon Tywi. High water levels in the Tywi can impact flood risk from the Afon Dulais. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the creation resilient landscapes that better manage flood risk sustainably. Air quality and soil stability may also be improved through natural flood management techniques such as tree planting, that could be designed to maximise this potential. This action also has the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing, the historical landscape, and adaptation to climate change with non-invasive flood management strategies. **Recommendations:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs.
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	

8 Western

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
Whitland	Prevention	Retrofit SuDS	Retrofit SuDS to provide attenuation and wider benefits in urban areas, particularly those with a history of flooding from surface water such as Trevaughan.	+	+	+	+	+	+	Whitland is a rural town located in western Carmarthenshire. The main Rivers Taf, Marlais, Gronw, Cwm Waun Gron flow through this community. While this community is at a greater risk of fluvial flooding, there have also been a history of surface water flood events, especially in Trevaughan. Key receptors include Dyfryn Taf school, Whitland train station, and Main Roads (A440 and B4328. While reducing flood risk, the 'Retrofit of SuDS' action would be expected to provide benefits to the wellbeing of the population, water quality, biodiversity, key receptors and adaptation to climate change through methods such as the reduction of runoff and providing attenuation. This less intrusive strategy could also aid in the protection of the townscape and can offer further opportunities for residents to engage with nature. Some SuDS measures, such as planting and green roofs, may also have wider positive urban which may benefit air, soil and water quality. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the creation resilient landscapes that better manage flood risk
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	M	M	M	
		Natural Flood Management	Explore opportunities for Natural Flood Management measures in CCC owned farm located to the east of the town centre and north on Taff catchment. Measures such as attenuation basins, leaky dams, or woodland planting may provide some benefit.	+	+	+	+	+	+	
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Prevention/	Asset Mana	Improve understanding of CCC assets (including drainage) in the town centre	+	+	+	+	+	+	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			through data review and surveys. Engage with NRW to understand maintenance plan for flood defences, for example the flood wall and embankments at Parc Dr Owen and the areas to the south.							sustainably, leading to positive effects against all SEA objectives. The 'Hard Engineering' action has the potential to improve flood management in Whitland, enhancing the wellbeing of the population, built assets, and offering protection to natural resources and water quality. However, implementing flood defences adjacent to properties and along the River Taf and Cwm Waun Gron can disrupt the townscape and natural landscape. Hard engineering could also have damaging effects on local biodiversity and natural resources and may require ongoing maintenance and extensions into the future. This can result in low adaptability to the future flood risks of climate change. The 'Asset Management & Maintenance' action also has the potential to enhance the flood management of the local area, subsequently improving public wellbeing, protecting water quality, natural resources, and future adaptability to flood risk. This could be achieved through the decreased risk of infrastructure failures, extended lifespan of known assets, and the mitigation of threats as they arise. This action would also focus on maintaining assets already in place, reducing the need for new flood defences with the potential to negatively affect the townscape, historical landscape, and biodiversity. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
	Protection	Hard Engineering	Potential for flood defences along the Rivers Taf and Cwm Waun Gron adjacent to Trevaughan to protect properties.	+/-	+	+	-	+/-	-	
			Longevity	S-L	S	M-L	M-L	L	S-L	
			Reversibility	R	IR	IR	IR	R	IR	
			Certainty	H	H	H	H	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation**: Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible. **Recommendation:** Design multi-functional SuDS features to improve both flood resilience and public accessibility. **Recommendation:** Incentivise SuDS adoption as a method of property flood resilience to enhance the wellbeing of the population with less-invasive, sustainable flood management techniques. **Recommendation:** Locate and map all flood defences and areas of high flood risk, ensuring an up-to-date database of locations and conditions. This can ensure future asset management plans are accurate and can best defend Whitland. **Recommendation:** Where possible, integrate natural flood management techniques into maintenance strategies.
Laugharne	Prevention	Natural Flood Management	Seek opportunities to implement Natural Flood Management across agricultural land on Afon Coran and ordinary watercourse catchments upstream of the town could reduce peak flows and combat surface water related issues.	++	+	++	+	+	+	Laugharne is a coastal town at risk of flooding from both rivers and the sea. This area has also historically been at risk of surface water flooding due to the age of drainage systems and the lack of thresholds on old cottages. More recently, agricultural land use issues have also resulted in surface water problems. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										creation resilient landscapes that better manage flood risk sustainably. Air quality and soil retention may be improved through natural flood management techniques such as tree planting, which could be designed to maximise this potential. This action also has the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing, the historic landscape, and adaptation to climate change with non-invasive flood management strategies. The 'Asset Management and Maintenance' action has the potential to enhance the flood management of the local area, subsequently improving public wellbeing, protecting water quality, natural resources, and future adaptability to flood risk. This could be achieved through the decreased risk of infrastructure failures, extended lifespan of known assets, and the mitigation of threats as they arise. This action would also focus on maintaining assets already in place, reducing the need for new flood defences with the potential to negatively affect the townscape, historical landscape, and biodiversity. The 'Property Flood Resilience' action could have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Laugharne. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alterations to the townscape, and negative effects on biodiversity and water quality. This may also increase
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Prevention/ Protection	Asset Management & Maintenance	Improve understanding of CCC assets (including drainage) through data review and surveys.	+	+	+	+	+	+	
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	
	Preparedness	Property Flood Resilience	Empower residents to take agency over own flood risk by exploring Property Flood Resilience measure.	-	+/-	-	-	+	-	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation:** Locate and map all CCC assets and drainage infrastructure ensuring an up-to-date database of locations and conditions. This can ensure future asset management plans are accurate and can best defend Laugharn **Recommendation:** Residents can provide valuable insight into recurring issues such as blocked drains or instances of high run-off. The development of an accessible public reporting system could enhance water management. **Recommendation:** Incentivise SuDS adoption as a method of property flood resilience to enhance the wellbeing of the population with less-invasive, sustainable flood management techniques. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										property level measures, to ensure that flood risk is not exacerbated elsewhere.
St Clears	Preparedness	Asset Management & Maintenance	Seek opportunities to work with the Highways Authority and DCWW and develop a 'master map' of sub-terranean drainage systems	+	+	+	+	+	+	St Clears is situated near the River Tâf and is particularly susceptible to flooding during periods of intense rain, which can overwhelm the local watercourses and drainage infrastructure. The knowledge of the drainage systems within this area is poor, with the exception of a privately owned culverted watercourse on Tenby Road which has historically been problematic. The 'Asset Management & Maintenance' action has the potential to enhance the flood management of St Clears while improving public wellbeing, protecting water quality, natural resources, and future adaptability. This can be achieved through the increased understanding of drainage systems and assets found within the locality and their location, which could improve how St Clears manages water. By mapping drainage assets, the local
			Longevity	M	M-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	M	M	M	H	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
		Property Flood Resilience	Empower residents to take agency over own flood risk by exploring Property Flood Resilience measures and development of a community flood group.	-	+/-	-	-	+	-	authorities could enhance their capability to track the condition of said assets, reducing the risk of infrastructure failures, extending the lifespan of known assets, and allowing for effective mitigation of threats as they arise. This action focuses on maintaining assets already in place, reducing the need for new flood defences with the potential to negatively affect the townscape, historical landscape, and biodiversity. The 'Property Flood Resilience' action could have the potential to improve local climate resilience and the mental and physical wellbeing of residents within St Clears. While empowering residents to implement property-level flooding measures could protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alterations to the townscape, and negative effects on

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. However, the proposal to develop a community flood group could mitigate potential negative effects, allowing for opportunities for education on flood risk and the potential risks of property flood measures. This action could harbour a collaborative approach to flood management in St Clears, potentially maximising the benefits of property flood resilience. **Recommendation:** Locate and map all CCC assets beyond drainage infrastructure, ensuring an up-to-date database of locations and conditions. This can ensure future asset management plans are accurate and can best defend St Clears.

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Reversibility	R	R	R	R	R	R	**Recommendation:** Use historical flood data and climate change projections to inform maintenance and asset management strategies. **Recommendation:** The incorporation of sustainable drainage features could be considered as improvements to existing flood defences, helping to maximising their ability to manage flood risk sustainably. **Recommendation:** Incentivise SuDS adoption as a method of property flood resilience to enhance the wellbeing of the population with less-invasive, sustainable flood management techniques. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere.

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Certainty	L	H	M	M	M	H	
Llansteffan	Prevention/ Protection	Asset Management & Maintenance	Business as usual: undertake regular maintenance of key assets including highways drainage, sewer networks, outfalls and watercourses.	+	+	+	+	+	+	Llansteffan is a small village on Tywi estuary that is at risk of both river and surface water flooding. Ordinary watercourse, Nant Jack, arises from high ground to the north east of the village. It is classed as 'main river' downstream of the road bridge. The village's proximity to the Tywi estuary and the surrounding hilly terrain can contribute to localised flooding, particularly in low-lying areas or along the riverbanks.
			Longevity	M	M-L	M-L	M-L	L	S-L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Reversibility	R	R	R	R	R	R	Approximately 34 properties in Llansteffan and the surrounding communities were affected by flooding to various extents across two storms in Winter 2023/24. The preventative/protective 'Asset Management & Maintenance' action has the potential to enhance the flood management of Llansteffan while improving public wellbeing, protecting water quality, natural resources, and future adaptability. This could be achieved through the decreased risk of infrastructure failures, extended lifespan of known assets, and mitigation of threats as they arise. This action would focus on maintaining assets already in place, reducing the need for new flood defences with the potential to negatively affect the townscape, historical landscape, and biodiversity. The preparedness 'Property Flood Resilience' action could have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Llansteffan. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alterations to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. However, the proposal to develop a community flood group could
			Certainty	M	M	M	M	H	H	
	Prevention	Natural Flood Management	Implementing Natural Flood Management techniques across upper catchment of Nant Jac and other ordinary watercourses such as woodland planting, gully blocking, leaky dams could slow could reduce peak flows on these watercourses.	++	+	++	+	+	+	
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	
	Preparedness	Property Flood Resilience	Empower residents to take agency over own flood risk by exploring Property Flood Resilience measures and development of a community flood group.	-	+/-	-	-	+	+/-	
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	
	Protection	Hard Engineeri	Implement changes to the outfalls that service the Morfa.	+/-	+	+	+/-	+	+/-	
			Longevity	S-L	S	M-L	M-L	L	S-L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Reversibility	R	IR	IR	IR	R	IR	mitigate potential negative effects, allowing for opportunities for education on flood risk and the potential risks of property flood measures. This action could harbour a collaborative approach to flood management in St Clears, potentially maximising the benefits of property flood resilience. The 'Hard Engineering' actions both have the potential to enhance how Llansteffan manages flood risk while enhancing water quality, population wellbeing, and the protection of natural resources and biodiversity. The action to explore the potential of improving highways drainage and increasing capacity of assets could mitigate localised flooding and enhance runoff. However, methods of hard engineering could also have damaging effects on natural resources and biodiversity, particularly during construction, and may require ongoing maintenance and extensions into the future, offering low climate adaptability. If the new flood defences disrupt views or historical sites/buildings, they can also alter the townscape's character. These effects can also be seen with the action to implement changes to outfalls that service the Morfa due to the potential hard engineering
			Certainty	H	H	H	H	M	H	
		Hard Engineering	Support the Highways Authority Explore potential of improving highways drainage and increasing capacity of assets.	+/-	+	+	+/-	+	+/-	
			Longevity	S-L	S	M-L	M-L	L	S-L	
			Reversibility	R	IR	IR	IR	R	IR	
			Certainty	H	H	H	H	M	H	
	Review	Improved flood mapping and modelling	Undertake a detailed hydrological and hydraulic modelling could provide greater insights into flooding mechanisms and flow regimes for this community to better tailor actions.	+	+	+	+	+	+	
			Longevity	M	M-L	M	M	L	M	
			Reversibility	R	R	R	R	R	R	
			Certainty	M	L	H	H	M	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
	Prevention and Protection	Property Flood Resilience	Undertake a strategic review of flood risk in the area and develop a long list of options for the further management of flood risk. Alongside this, develop a business case to seek funding to implement any potential options.	+	+	+	+	+	+	has to protect or harm the SEA objectives, however, more detail is required on the proposed changes to accurately assess this objective. The 'Improving Flood Mapping and Modelling' and 'Asset Management & Maintenance' actions could allow for future resilience to climate change and offer better protection to biodiversity, natural assets, water quality, human health, and the townscape without introducing new flood management infrastructure. This can also ensure future asset management plans are accurate and can best defend the locality against the future risks of climate change. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the creation resilient landscapes that better manage flood risk sustainably. Air quality and soil retention may also be improved through natural flood management techniques such as tree planting, which could be designed to maximise this potential. This action also has the potential to lead to significant positive effects for biodiversity and water quality, and positive effects for population wellbeing, the historical landscape and adaptation to climate change with non-invasive flood management strategies. The preventative and protective Property Flood Resilience action has the potential to have a positive effect on all SEA Objectives by enhancing local understanding of flood risk and working towards its future management. This action allows for a targeted approach to flood management within Llansteffan, and by undertaking this strategic review, this action could maximise the potential
			Longevity	S-L	S-L	M-L	M-L	L	S-L	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
			Reversibility	R	R	R	R	R	R	of property flood resilience in the area by minimising the possibility of negative effects seen by other property flood resilience actions. Seeking funding to implement these measures could also reduce the potential for inequalities between households/properties. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation:** Locate and map all CCC assets and drainage infrastructure ensuring an up-to-date database of locations and conditions. This can ensure future asset management plans are accurate and can best defend Llansteffan. **Recommendation:** Residents can provide valuable insight into recurring issues such as blocked drains or instances of high run-off. The development of an accessible public reporting system could enhance water management. **Recommendation:** Hard engineering or re-routing solutions should ensure that damage to ecosystems, soils and air quality is minimised and avoided where possible. **Recommendation**: Use historical flood data and climate change projections to inform maintenance and asset management strategies.
			Certainty	L	H	M	M	M	H	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
										Recommendation: Residents can provide valuable insight into recurring issues such as blocked drains or instances of high run-off. The development of an accessible public reporting system within community flood groups could enhance water management.
Llanddowor	Prevention	Natural Flood Management	Seek opportunities to explore Natural Flood Management techniques in upper catchment such as leaky dams and gully blocking could attenuate runoff and reduce downstream pressures.	++	+	++	+	+	+	Llanddowor is a village located on an ordinary watercourse south of the confluence with the Afon Taff. Historically, there have been major flood related issues with runoff arising in the upper catchment coming out of bank and flooding multiple dwellings within the village. By utilising sustainable techniques to manage flooding, the 'Natural Flood Management' action could aid in the creation resilient landscapes that better manage flood risk sustainably. Air quality and soil stability may be improved through natural flood management techniques such as tree planting, which could be designed to maximise this potential. This action also has the potential to lead to significant positive effects for biodiversity and water
			Longevity	S-L	M-L	M-L	M-L	L	M-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	H	M	M	H	M	M	

Community	Action Type	Potential Action	Description	SEA Objective						Appraisal and Recommendations
				1. Biodiversity	2. Health& Wellbeing	3. Water Quality	4. Natural Resources	5. Climate Adaptation	6. H.env & Landscape	
	Preparedness	Property Flood Resilience	Empower residents to take agency over own flood risk by exploring Property Flood Resilience measures.	-	+/-	-	-	+	+/-	quality, and positive effects for population wellbeing, the historical landscape, and adaptation to climate change with non-invasive flood management strategies. The 'Property Flood Resilience' action could have the potential to improve local climate resilience and the mental and physical wellbeing of residents within Llanddowor. While empowering residents to implement property-level flooding measures can protect individual properties, a lack of awareness and consideration of their surroundings may inadvertently worsen flooding impacts in the area, leading to issues such as increased soil loss, alterations to the townscape, and negative effects on biodiversity and water quality. This may also increase health inequalities in the area unless accommodations are made for those who cannot implement these defences themselves. **Recommendation:** Natural flood management could consider the soil quality and quantity issues in the area and seek to include improvement measures as part of designs. **Recommendation:** Combine multiple Natural flood management techniques such as tree planting, wetland creation, and soil infiltration zones to maximise water management and potential benefits to biodiversity. **Recommendation:** It is recommended that parameters are put in place with regards to enabling individual property level measures, to ensure that flood risk is not exacerbated elsewhere.
			Longevity	S-L	S-L	M-L	M-L	L	S-L	
			Reversibility	R	R	R	R	R	R	
			Certainty	L	H	M	M	M	H	

Carmarthenshire County Council:

Local Flood Risk Management Strategy 2024-2030

SEA Scoping Report

FEBRUARY 2025

Local Flood Risk Management Strategy 2024-2030

SEA Scoping Report

Author	WP
Checker	CB
Reviewer	ST
Approver	AP
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Appendices

Abbreviations

Abbreviations	Definition
CaRR	Community at Risk Register
CCC	Carmarthenshire County Council
DrWPA	Drinking Water Protected Area
FCERM	Flood and Coastal Erosion Risk Management
FRMP	Flood Risk Management Plan
LFRMS	Local Flood Risk Management Strategy
LLFA	Lead Local Flood Authority
LSE	Likely Significant Effect
NRW	Natural Resources Wales
RBD	River Basin District
SEA	Strategic Environmental Assessment
WFD	Water Framework Directive

1 Introduction

1.1 Local Flood Risk Management Strategies: Wales

1.1.1 The Flood and Water Management Act 2010[1] (the Act) requires all 22 Lead Local Flood Authorities (LLFAs) in Wales to produce a Local Flood Risk Management Strategy (LFRMS). The Welsh Government's National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales (National Strategy) sets out that approximately 273,000 properties across Wales are at risk of flooding from rivers, the sea and surface water, with almost 400 properties also at risk from coastal erosion[2]. Carmarthenshire County Council (CCC) published its first LFRMS in May 2013, setting out their overarching approach to managing flood risk in Carmarthenshire. A second LFRMS has been drafted, as is the second iteration of a separate Flood Risk Management Plan (FRMP).

1.1.2 A LFRMS is a high-level strategy document, providing a framework for the development of specific measures and decision making, associated with managing local flood risk. CCC aims to promote a holistic approach, whilst delivering wider social, economic and environmental benefits.

1.1.3 A SEA Scoping Report was prepared for the first LFRMS. Following on from the Scoping Report, CCC commissioned the preparation of an SEA Environmental Report (March 2013). The SEA Environmental Report highlighted the likely significant impact of the strategy on the environment and advised of reasonable alternatives or additional measures that may be necessary to achieve compliance with the relevant legislation. The SEA Environmental Report assessed the potential measures for consideration, but it is noted that these are only to be implemented as part of the detailed Flood Risk Management Plan, and thus, the SEA Environmental Report notes that there was limited information against which to make an assessment. Therefore, determining the significance of effects was not possible.

1.2 Background to LFRMS

1.2.1 In accordance with the requirements of the Act, the LFRMS only needs to address flood risk arising from local sources. Under the Act, local sources of flooding are defined as follows:

- Surface water runoff;
- Groundwater; and

[1] Available at: Flood and Water Management Act 2010 (legislation.gov.uk) [Accessed: 29.11.24]
[2] Gov.wales (2024) Environment and Countryside flooding, properties at risk. Available at: Properties at Risk of Flooding 2024 [Accessed: 15.01.25]

- Ordinary watercourses including any lakes, ponds or other waterbodies that flow into an ordinary watercourse.

1.2.2 The LFRMS focuses on these local sources of flood risk but, as Carmarthenshire has over 90km of coastline, the management of the risk of flooding from the sea and erosion have also been considered.

1.2.3 The LFRMS aims to reduce the risk of flooding where possible, as well as foster greater resilience to flooding when it occurs.

1.2.4 This LFRMS includes the following key components:

- Roles and responsibilities for managing flood risk.
- Carmarthenshire's strategic objectives, which align with National Strategy objectives.
- A strategic assessment of flood risk in Carmarthenshire at a river basin district (RBD) level.
- Overarching measures to manage flood risk across Carmarthenshire.
- Funding and prioritisation.
- Monitoring progress in delivering the LFRMS.

1.3 Flood Risk Management Plan (FRMP)

1.3.1 The FRMP has been developed to implement the strategic objectives of the LFRMS which aim to reduce the risk of flooding to people and communities at community level through local actions.

1.4 Strategic Environmental Assessment

1.4.1 SEA is a requirement of several pieces of legislation including the European Directive 2001/42/EC 'on the assessment of the effects of certain plans and programmes on the environment' (The SEA Directive)[3] which was transposed directly into Welsh law through the SEA Regulations[4]. SEA is a systemic process for evaluating the environmental consequences of plans and programmes to ensure that environmental issues are integrated and assessed at the earliest opportunity in the decision-making process. Article 1 of the SEA Directive states that the aim is to:

[3] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment
[4] Environmental Assessment of Plans and Programmes (Wales) Regulations (SI 2004/1656 (W/170)) and in England, the Environmental Assessment of Plans and Programmes Regulations 2004 (SI 2004/1633)

"provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development".

1.4.2 SEA seeks to ensure that environmental considerations are part of the process of preparing certain plans and programmes. The objective of the Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with the Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment.

1.4.3 This assessment must also examine the likely significant effects of implementing reasonable alternatives to the plan or programme under consideration.

1.5 SEA Screening

1.5.1 An SEA Screening exercise was carried out in April 2024 to establish whether or not the LFRMS will be likely to lead to significant environmental effects. The SEA Screening Report set out the context of the LFRMS and identified potential interactions of the LFRMS with the environment and an explanation of the significance of effects. The SEA Screening Report sought to conclude that the LFRMS would be unlikely to lead to significant environmental effects, and therefore, a full SEA would not be required, due to the nature and scale of development likely to be proposed within the LFRMS.

1.5.2 The SEA Screening Report was submitted to Welsh Consultation Authorities, Natural Resources Wales (NRW). The consultation responses received from NRW disagreed with the findings of the Screening exercise and suggested that a full SEA should be undertaken for the LFRMS. Following the advice of the Consultation Authorities, CCC agreed that there was potential for the SEA process to have a significant positive influence on the LFRMS, through the consideration of a high-level assessment and address any potential significant environmental effects. Therefore, a full SEA of the LFRMS is being undertaken, the first stage of which is this SEA Scoping Report.

1.6 Purpose of the SEA Scoping Report

1.6.1 SEA is a legally required process for assessing the environmental effects of a plan and aims to ensure that sustainable development is at the heart of the plan-making process. The SEA Regulations require the authority preparing the plan to consult the

Consultation Authorities (NRA and Cadw) on the scope and level of detail of the SEA. The preparation of an SEA Scoping Report provides the most effective means of undertaking this consultation by providing the consultees with a document upon which they can make comments.

1.6.2 This SEA Scoping Report represents the initial stage in the SEA process for the emerging LFRMS and sets the scope for the remainder of the process. Its purpose is to:

- Set the scope and level of detail of the SEA;
- Identify relevant plans, policies, programmes and initiatives that will inform the SEA process and the LFRMS;
- Identify relevant baseline information;
- Identify key sustainability issues and problems of relevance to the LFRMS; and
- Present a SEA Framework, consisting of sustainability objectives and indicators, against which the emerging Strategy can be assessed.

1.7 Consultation

1.7.1 The Consultation Authorities (NRW and Cadw) responded to the consultation on the SEA Scoping Report. The comments received have been taken into account and this SEA Scoping Report updated accordingly. The consultation comments are presented in Appendix C.

2 The SEA Process

2.1 Stages in the SEA process

2.1.1 The Office of the Deputy Prime Minister's (OPDM) Practical Guide to the SEA Directive[5] subdivides the SEA process into a series of stages. Whilst each stage consists of specific tasks, the intention should be that the process is iterative. Table 2.1 presents the key stages in the SEA process and indicates where specific tasks have been addressed in this Scoping Report. The table also demonstrates how each of the SEA stages is linked to the LFRMS. This Report represents Stage A of the SEA process.

Table 2.1: Stages in the SEA process

SEA Stage	Section of the Report (where applicable)	Application to the LFRMS
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope		
A1: Identifying other relevant policies, plans and programmes and sustainability objectives	Section 3 and Appendix A	Stage A corresponds to the scoping stage of the SEA and the findings of this stage are presented in this Scoping Report. This Scoping Report will be consulted upon for 5 weeks with the statutory consultation authorities.
A2: Collecting baseline information	Section 4 and Appendix B	
A3: Identifying environmental problems	Section 4	
A4: Developing SEA objectives	Section 5	
A5: Consulting on the scope of the SEA	Purpose of this Scoping Report is to seek feedback on the scope of the SEA.	
Stage B: Developing and Refining Options and Assessing Effects		
B1: Testing the plan or programme objectives against the SEA objectives	All of these stages will be documented in the SEA Environmental Report.	Stage B is linked to the overall production of the LFRMS. There should be a considerable degree of interaction between the plan-making and SEA teams during this stage in the process to enable potential adverse effects of the LFRMS to be avoided/ minimised and potential sustainability benefits maximised.
B2: Developing strategies alternatives		
B3: Predicting the effects of the plan or programmes, including alternatives		
B4: Evaluating the effects of the plan or programme, including alternatives		
B5: Mitigating adverse effects		

[5] Available at: A Practical Guide to the Strategic Environmental Assessment Directive (publishing.service.gov.uk) [Accessed: 28.11.24]

SEA Stage	Section of the Report (where applicable)	Application to the LFRMS
B6: Proposing measures to monitor the environmental effects of the plan or programme implementation		
Stage C: Preparing the SEA Environmental Report		
C1: Preparing the SEA Environmental Report	-	An SEA Environmental Report and Non-Technical Summary documenting the effects of the LFRMS will be prepared and will include an assessment of the options considered during the development of the Strategy.
Stage D: Consulting on the draft plan or programme and the SEA Environmental Report		
D1: Consulting the public and Consultation Authorities on the draft plan or programme and the SEA Environmental Report	-	The SEA Environmental Report will be consulted upon alongside the draft LFRMS.
D2: Assessing significant changes		Following the receipt of consultation feedback, the SEA Environmental Report and the LFRMS may need to be updated to reflect comments received.
D3: Making decisions and providing information		
Stage E: Monitoring the significant effects of implementing the plan or programme on the environment		
E1: Developing aims and methods for monitoring	-	Monitoring will commence once the LFRMS has been adopted.
E2: Responding to adverse effects		

3 Review of relevant Plans, Programmes and Strategies

3.1 Introduction

3.1.1 The LFRMS will be influenced in various ways by other plans or programmes, or by external environmental (or sustainability) protection objectives such as those laid down in policies or legislation. Understanding these relationships can enable the strategy-makers to take advantage of potential synergies, identify opportunities and deal with any inconsistencies and constraints. A large number of other plans and programmes have been reviewed with respect to relevant social, economic, environmental and cultural issues of importance to each of the integrated assessment strands.

3.1.2 The SEA Regulations specifically require relevant plans and programmes to be considered as part of the development of the SEA Scope. Box 1 stipulates the SEA Regulations requirements for this stage of the process.

Box 1: SEA Regulations requirements for the review of Plans Programmes and Environmental Protection Objectives

> *"An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes"* (Schedule 2 (1))
>
> *"The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation"* (Schedule 2 (5))

3.1.3 A review of plans, programmes and strategies that may affect the preparation of the Strategy was undertaken in order to contribute to the development of both the SEA and the Strategy. This included:

- Identification of any external social, environmental or economic objectives, indicators or targets that should be reflected in the SEA process.
- Identification of any baseline data relevant to the SEA.
- Identification of any external factors that might influence the preparation of the document, for example sustainability issues.
- Identification of any external objectives or aims that would contribute positively to the development of the Strategy.
- Determining whether there are clear potential conflicts or challenges between other identified plans, programmes or sustainability objectives and the emerging LFRMS.

3.1.4 The review included documents prepared at international, national, regional and local scale. A brief summary of the documents reviewed, and the main findings are summarised below in Table 3.1. Further details presented in Appendix A which identifies key themes from the review.

Table 3.1: Summary of the PPP review

Themes relevant to SEA of LFRMS	Summary
International	A review was undertaken of key International Conventions that could potentially influence the development of the LFRMS and the SEA.
UK	A review was also undertaken of relevant publications from organisations including, for example, Department for Transport (DfT), the Department of Business, Energy and Industrial Strategy (DBEIS), and the Department for Environment, Food and Rural Affairs (Defra). These publications outline the action plans and strategies across a breadth of topic areas for example The Air Quality Strategy for England, Scotland, Wales and Northern Ireland and the UK Integrated National Energy and Climate Plan (NECP) as well as the Committee on Climate Change (2021) UK Climate Change Risk Independent Assessment: Technical Report (particularly the 'Summary for Wales'). The objectives of these plans, as well as some of the challenges they raise need to be taken on board, as appropriate. Any previous relevant European Directives are transposed into national regulations.
National	A review was undertaken of plans produced at the Wales national level. Many of these are produced by Welsh Government and specifically address strategic issues such as the economy; transport; health; safety; sustainable communities; housing; employment; and environmental protection.
Regional	In some circumstances, there are region-specific plans and programmes that have been prepared. This includes and Energy Strategy, Regional Economic Framework and Economic Delivery Plan. These documents set out locally specific aims and priorities to promote growth and sustainable measures in South West Wales.
Local	A review was undertaken of local plans produced by Carmarthenshire County Council. These address strategic issues such as a transformation strategy to modernise and drive significant change across the county, equality, social care, poverty, Welsh language promotion, and waste. These programmes aim to develop

Themes relevant to SEA of LFRMS	Summary
	Carmarthenshire into a modern, healthy, and equal county with fewer local disparities.

4 Sustainability baseline and key issues and opportunities for the LFRMS

4.1 Introduction

4.1.1 Baseline information (social, economic, environmental and cultural) provides the basis for predicting and monitoring environmental effects and helps to identify environmental issues and alternative ways of dealing with them. As the LFRMS is a local-scale document, baseline evidence gathering has been focussed on local-scale data of relevance to the indicators that might be affected by the Strategy, with some national-scale data where there are data gaps.

4.1.2 The box below presents the SEA Regulations requirements for this stage of the process.

Box 2: SEA Regulations Requirements for baseline and the identification of key sustainability issues

"Relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme" (Schedule 2 (2))

"The environmental characteristics of the areas likely to be significantly affected" (Schedule 2 (3))

"*Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds(a) and the Habitats Directive"* (Schedule 2 (4))

4.2 Methodology

4.2.1 Characterising the environmental and sustainability baseline, issues and context is an essential part of developing the SEA Framework. It comprises the following key elements:

- Characterising the current state of the environment of the site and the surrounding areas including social and economic aspects; and
- Using this information to identify existing problems and opportunities that could be considered in the LFRMS.

4.2.2 The environmental, social and economic baseline was characterised through the following methods:

- Review of relevant local, regional and national plans, programmes and strategies; and
- Data research based around a series of baseline indicators developed from the SEA Regulations topics, SEA guidance, previous consultation recommendations from other SEAs and the data available for the region.

4.2.3 The collation of baseline data also enabled the identification of key sustainability issues and opportunities affecting Carmarthenshire.

4.2.4 Appendix B summarises the key baseline trends identified for Carmarthenshire and the surrounding areas. Sustainability issues and opportunities identified in the baseline review are detailed in Table 4.1.

Table 4.1: Key sustainability issues and opportunities for LFRMS

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
Biodiversity, Flora and Fauna	• Key pressures to Carmarthenshire's biodiversity include water and air pollution capable of adversely affecting biodiversity; flash flooding with the potential to harm aquatic ecosystems; changes to microclimate which have the potential to alter the performance of some species of plants and animals; exploitation of marine and coastal environments; habitat loss and fragmentation and pressure from development . Resilient Ecological Networks (RENs) offer a key opportunity to respond to these threats. Focusing on nature recovery, which is vital to rebuilding ecological resilience, RENs expand, connect, and manage protected areas, promoting species movement, habitat resilience, and offering a nature based solution to environmental and climate emergencies such as flooding. • Coastal squeeze is a significant challenge for Marine Protected Areas (MPAs) in Carmarthenshire, with projections indicating a loss of 93 hectares of saltmarsh in Carmarthen Bay by 2155 . The Shoreline Management Plan (SMP) is a critical policy framework for addressing risks associated with coastal flooding and erosion, offering large-scale assessments to guide sustainable management of the coastline. By fostering collaboration between the SMP and the LFRMS, there is an opportunity to mitigate the impacts of coastal squeeze, reduce flood risk, and enhance the protection of Carmarthenshire's MPAs. • Non-native, invasive plant species on watercourses present a key risk to biodiversity and flooding in Carmarthenshire. Aquatic

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	species such as Parrot's Feather and New Zealand Pygmy weed have the ability to rapidly dominate a waterbody, contributing to the crowding out of native species and the destabilisation of riverbanks. This potentially increases the risk of flooding and harm to local biodiversity . • In order to accommodate urban and industrial developments, some watercourses within Carmarthenshire have been confined or re-routed (most notably the Dafen and Lliedi rivers in Llanelli) . Physical modifications are a primary pressure to ecology within watercourses, and it is predicted to continue and even increase into the future . The LFRMS provides an opportunity to address these challenges by integrating ecological considerations into flood risk management. Through measures such as river restoration and the removal or re-design of artificial barriers, the LFRMS can help improve ecological resilience while also managing flood risk. Natural Resources Wales (NRW) is seeking to work in partnership with the environmental sector, land owners, and communities in Wales to deliver an action plan designed to improve current approaches to monitoring the health of protected sites in the future, highlighting a key opportunity to accurately improve Carmarthenshire's nationally protected sites18. • There are opportunities for the condition of biodiversity assets to be improved and opportunities should be sought to deliver biodiversity enhancements where possible, for example by targeting the issues that are driving decline and supporting recovery. • There are many high flood risk receptors within Carmarthenshire and its designated sites. With 8942 SSSI, 8114 SAC, and 2009 SPA high risk flood receptors, flooding is a key pressure for Carmarthenshire's biodiversity. There is an opportunity for the LFRMS to mitigate this pressure on biodiversity through the management of these protected sites and their flood risk receptors. • There is a key opportunity to manage flooding in the LFRMS through the utilisation of nature-based solutions and sustainable land management strategies, both of which share principles of ecosystem stewardship, resilience building, and sustainability. Within these strategies, methods including Green and Blue infrastructure, peatland restoration, and soil and land

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	management can contribute to enhanced ecological connectivity and resilience while improving flood management within Carmarthenshire. • Under 'The Carmarthenshire Nature Partnership', a local organisation with the mission to identify priority areas for action to build ecosystem resilience4, a Carmarthenshire Local Nature Recovery Plan (LNRP) (2020-2030) is being developed and undertaken. Not only focusing on designated sites, the LNRP seeks to improve the biodiversity of Carmarthenshire through six key objectives dedicated to restoring degraded habitats, improving the resilience of the wider natural environment, and improving county wide evidence and understanding. This is in efforts to help deliver the commitments of the UN Convention on Biological Diversity and the EU Biodiversity Strategy to halt the decline of the local biodiversity, then reverse that decline. • The Carmarthenshire LNRP emphasises the importance of looking beyond the county's internationally and nationally designated sites to focus on the wider natural environment. This approach presents an opportunity to adopt a holistic strategy for enhancing biodiversity. By embedding biodiversity considerations into the LFRMS, addressing key pressures on species and habitats, and implementing a robust framework of governance and support, the plan provides a clear pathway for delivering meaningful and sustainable action. • A key opportunity for the enhancement of biodiversity in Carmarthenshire can be seen in the 'Greening Carmarthenshire' project. With the aim to enhance the green and blue infrastructure (GBI) network found throughout both the urban and rural landscapes of the county, this project seeks to promote the use of Nature based solutions to not only promote the conservation of biodiversity but also make the county a healthier place to live, work, and play. • The 'Green and Blue Infrastructure Assessment' within the Revised 2018-2030 Local Development Plan for Carmarthenshire highlights the importance of incorporating multifunctional GBI into development proposals across the county. The assessment calls for public bodies to prioritise planning for GBI that not only supports the creation of RENs but also delivers tangible benefits for people by improving biodiversity and ecosystem services. The LFRMS presents a key opportunity to align with these principles

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	by integrating GBI into flood management strategies. Features such as wetlands, sustainable drainage systems (SuDS), and natural floodplains can reduce flood risk while simultaneously enhancing biodiversity, improving water quality, and building ecological resilience. • A Forest Resource Plan (FRP) is a key management document for the Welsh Government's Woodland Estate (WGWE). These plans outline proposals for the future management of woodlands, aligning with current policies and practices. To meet the standards established by the UK Forestry Standard (UKFS) and the UK Woodland Assurance Standard (UKWAS) for water management and flood risk, future iterations of FRPs will be developed. These updated plans present an opportunity to enhance the resilience of ecosystems in Carmarthenshire while designing and managing forests to contribute to flood risk reduction.
Population	• The expected continuation of the aging population in Carmarthenshire could place increased pressure on healthcare, social services, and retirement-related infrastructure, while reducing the workforce population. • The decline of Welsh speakers poses risks for cultural preservation, efforts to revitalise this language presents itself as a key opportunity. • The high reliance on private cars could result in elevated carbon emissions and thus environmental concerns, prompting the opportunity to ensure the maintenance of access to public transport and its infrastructure. • The LFRMS should seek to protect the local economy by maximising the resilience of services, sustainable transport infrastructure and accessibility networks. • Densely populated residential areas and key roads such as Bridge Street and Hillfield Villas are among the areas at most risk of coastal and river flooding. The extensive car parks, paved, and heavily built-up areas across the county also increase the risk of surface water flooding. A key opportunity to reduce this risk is presented in the 'Green and Blue Infrastructure Assessment' within the Revised 2018-2030 Local Development Plan for Carmarthenshire. This emphasises the importance of maximising opportunities to integrate multifunctional GBI within development proposals throughout the county, enhancing flood and water

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	management within residential, built environments. The use of SuDS is also an opportunity to mitigate the risk to key urban flood receptors. • Ammanford's flood risk management scheme has reduced flood risk to key transport routes, Ammanford railway station, and 235 properties, highlighting key opportunities for the LFRMS to improve flood management in Carmarthenshire. • With the number of properties at high risk of flooding in Carmarthenshire and coastal erosion projected to increase, addressing climate change is critical to the county's future flood risk management. Combined with population growth and the rising demand for residential infrastructure, there is an opportunity for the LFRMS to integrate flood resilience into new housing developments while adapting existing infrastructure. This could facilitate the enhanced management of increased water levels and flooding events.
Human Health	• The limited access to public transport and rurality of the county may present an issue for access to NHS services, particularly due to the aging population. The LFRMS should ensure that accessibility is maintained or improved through flood risk management measures. • The LFRMS could enhance green open spaces as part of flood risk measures, to promote health and wellbeing. • The variation of deprivation throughout the county could reflect a combination of key issues surrounding historical, economic, geographic, and social factors that have shaped the development and resources of the county over time, highlighting the opportunity to target and develop key factors of concern within each locality. The deprived localities of Carmarthenshire could also be disproportionately affected by flooding and risk of flooding, and the LFRMS should seek to reduce potential geographical inequalities which may contribute to this flood risk. • There may be an opportunity for the combination of flood risk management measures and investment in pedestrian footpaths and cycling infrastructure, which can lower emissions, promote healthier lifestyles, and reduce car dependency. • The ageing population in Carmarthenshire could struggle with some flood risk management measures such as those providing alerts. If systems aren't developed to meet the needs of the older

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	population, instances of isolation and reduced access to essential services may increase. • The Carmarthenshire Public Services Board (PSB) have produced a Well-being plan to improve the economic, social, environmental, and cultural wellbeing of the county from 2023-2028. Presenting a key opportunity to improve health and resilience within Carmarthenshire, the plan follows objectives including the reduction of health inequalities and responding to climate and nature emergencies, such as flooding events . • The dedication to implementing new GBI throughout Carmarthenshire demonstrated in the revised 'Local Development Plan 2018 – 2033' creates an opportunity for improved nature contact within urban environments. Through enhancing green and blue spaces and their accessibility, the well-being of communities can benefit whilst the area is adapted to more efficient and sustainable flood management. • The British Red Cross research 'Every time it Rains' explores the experiences of communities impacted most severely by flooding, and highlights the areas in need for improvements in policy and practice that ensures people are prepared for, and can recover more quickly from flooding. This presents a key opportunity to improve the health and wellbeing of Carmarthenshire through improving how the county manages flooding.
Soil	• The predominantly acid loamy, clayey, and sandy soils may limit agricultural productivity and require specific land management practices, this should be considered when developing flood risk management measures in the LFRMS. • Slowly permeable soils around Carmarthen and the east increase the likelihood of surface water runoff and flooding during heavy rainfall. The low-lying areas of land are also susceptible to flooding, posing risks to both agricultural and developed land. • The high frequency of active quarries may contribute to environmental degradation, biodiversity loss, and localised flooding risks within Carmarthenshire. • A key opportunity is presented in the promotion of sustainable agricultural practices, such as contouring, to enhance soil stability and runoff. This will aid in reducing flood risk in the LFRMS. • A key opportunity for the improvement of flood management to mitigate soil erosion and the loss of topsoil is recognised with the

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	use of Sustainable urban drainage systems, such as permeable surfaces. • Due to their ties to flood risk, the coal tips in Carmarthenshire present a key issue for flood management in the county. Methods to manage these sites to reduce their impact is a key opportunity for the LFRMS. • Helping to revitalise and maintain peatland areas, the Carmarthenshire Bogs Project offers an opportunity to mitigate climate change, as healthy bogs can store carbon from the atmosphere and are one of the largest known carbon stores. Healthy peatlands can also absorb and hold large quantities of water, reducing surface runoff and offering an opportunity for the LFRMS to mitigate flood risk. • There is a key opportunity to reduce flood risk and soil erosion in the LFRMS seen in nature-based solutions. These sustainable, less invasive strategies can also provide wider benefits such as reducing water pollution and increasing resilience during droughts. Methods such as sustainable and regenerative agricultural land management within catchment areas have a key role in reducing soil surface run-off and erosion associated with degraded soil structure from intensive practices. • A 'Sustainable Farming Scheme' is commencing in Wales in 2026. This scheme is dedicated to making it easier for farmers to continue producing high quality food sustainably and meet commitments to nature, the environment, and climate change, which is a key opportunity to improve flood management, reduce flood risk, and reduce contributions to climate change from agricultural land in Carmarthenshire. •
Water	• The frequency of flooding presents a key risk in erosion of topsoil, particularly in agricultural areas. This can reduce agricultural productivity in the counties rural landscape, impact aquatic ecosystems and water quality with increased sedimentation in water bodies and increase reliance on artificial soil management. • Flooding can lead to contamination of water sources with pollutants such as sewage, agricultural runoff, and chemicals. • Rising costs of flood management, infrastructure repair, and compensation for affected communities can place strain on public

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	resources and inflict long-term stress on local businesses and residents. • The current investment in flood risk infrastructure, SuDS, and nature-based solutions is contributing to resilience to withstand present flood risks. However, with flooding events predicted to become more severe into the future, a further understanding of how the county may be affected and the investment requirements necessary to mitigate this are required to effectively prepare for the future risks of flooding in Carmarthenshire. The Carmarthenshire Interim Action Plan for Nutrient Neutrality presents the opportunity for the design of new developments in catchments of the River Teifi and Cleddau rivers, amongst others, with the integration of SuDS and nature-based solutions. This offers an opportunity to adapt Carmarthenshire to future flooding events, and offers wider benefits to the natural environment, such as pond creation to help reduce the flow of water but also provide an alternative water source for wildlife during drought. • The failure to meet phosphorus and water quality targets in the River Teifi and Cleddau highlights a significant opportunity for the Local Flood Risk Management Strategy (LFRMS) to enhance the management of protected rivers in Carmarthenshire, with the aim of improving ecological conditions across the county. Additionally, the '4 Rivers for LIFE' project presents a valuable opportunity to support the conservation of these protected water bodies by rehabilitating and restoring the natural processes, features, and habitats of the River Teifi and Cleddau. Beyond this, the LFRMS also has the potential to focus on rehabilitating and restoring non-protected rivers in Carmarthenshire, contributing to more sustainable water management practices and reducing flood risks throughout the region. • A key factor contributing to the failure of waterbodies in Wales under the Water Framework Directive (WFD) is the physical modification of watercourses, which has led to their disconnection from floodplains and riparian corridors. Addressing this issue could be achieved by collaborating with ongoing projects and delivery mechanisms, such as Area Statements and Opportunity Catchments, to develop and implement nature-based solutions that tackle the challenges currently affecting Carmarthenshire.

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	The focus of Opportunity Catchments is to maximise the benefits for waterbodies and wellbeing, and this collaboration can offer wide benefits relating to flood risk, climate change, wellbeing, and biodiversity, and offer the opportunity for the LFRMS to mitigate any negative effects of future physical modifications on the natural environment. • Flood management and resilience projects can boost the local economy and create employment. • Communities in the County have access to information and resources for flood risk, and to prepare for and respond to flooding, which present a key opportunity for future community resistance to flooding. • Carmarthenshire's bounty of natural water resources provides the opportunity to harness renewable energy from water. A key opportunity could be found in the installation of hydroelectric power projects and the integration of water-based renewable energy into the local energy network. • The abundance of waterbodies presents a key opportunity for tourism and eco-tourism centred around water-related landscapes and activities.
Air	• Air quality in Carmarthenshire is generally very good, reflective of its largely rural nature and high-quality natural environment. However, there are three AQMAs in Carmarthenshire. • Wales has some of the worst air quality in the UK, which is surprising given its low population density and relatively small cities. • The LFRMS should seek to ensure that air quality is not worsened through the creation of flood management measures and should seek the improve air quality through the creation of nature-based solutions and the protection of sustainable transport infrastructure. • A key opportunity for increasing climate resilience in urban areas in Carmarthenshire is seen in the implementation and development of green and blue infrastructure. For example, increasing the surface area of green cover can increase the water retention capacity of the environment and mitigate against both flooding and droughts, as well as wider environmental benefits. • Nature based solutions are a key opportunity for the LFRMS to reduce flood risk, while also contributing to the mitigation of climate

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	change. For example, peatland restoration can enhance carbon capture within Carmarthenshire.
Climatic Factors	• The landscape is also suited for solar and hydroelectric power, and investments in this renewable infrastructure can not only help meet local energy demands but also support Wales's transition to net zero emissions. This should be considered when considering flood risk management solutions. • The reduction of industrial, commercial, and domestic energy use since 2005 indicates positive progress towards energy efficiency, which presents an opportunity to further promote energy saving technologies and sustainable practices in these sectors. • The reliance on high-emission industries, particularly iron and steel production and gas powered energy supplies poses a significant risk to achieving net zero targets. Without substantial investment in cleaner technology and renewable energy, Carmarthenshire risks falling behind its climate commitments. • A key opportunity for increasing climate resilience in urban areas in Carmarthenshire is seen in the implementation and development of green and blue infrastructure. For example, increasing the surface area of green cover can increase the water retention capacity of the environment and mitigate against both flooding and droughts, as well as wider environmental benefits. • Nature based solutions are a key opportunity for the LFRMS to reduce flood risk, while also contributing to the mitigation of climate change. For example, peatland restoration can enhance carbon capture within Carmarthenshire.
Cultural Heritage and Archaeology	• Flooding presents a key risk to the integrity and conservation of Carmarthenshire's abundance of listed buildings, Parks & Gardens, Scheduled Monuments, and Conservation Areas, which form an integral part of the historic and cultural fabric of Wales. Increasing investment to and the management of water bodies and flooding throughout Wales presents a key opportunity to conserve the cultural heritage of Carmarthenshire. • The Historic Environment Group (HEG) is a high-level forum designed to include a strategic overview of issues and opportunities in the historic environment in Wales, and to promote common approaches to their protection. This is a key opportunity for the present and future protection of Heritage assets from flooding in

SEA Baseline Topic	Key Sustainability Issues and Opportunities for the LFRMS
	Carmarthenshire, and the LFRMS could collaborate with the HEG to enhance the understanding of environmental threats to heritage to assets in the county, and mitigate these risks. • The Royal Commission on the Ancient and Historical Monuments of Wales has mapped the historical boundaries of Wales to make them freely available. There is an opportunity to commission local refinement of the spatial mapping to the Carmarthenshire scale presented here, which can inform the LFRMS on key areas at risk of flooding, and can be then be addressed within the strategy.
Landscape	• The scenic and high-quality landscape within Carmarthenshire presents opportunities to develop eco-tourism, local identity, and branding surrounding its valuable natural features. • Opportunities to address the landscape challenges of climate change arise in climate resilient flood risk strategies including support for local species, habitat restoration projects, and wildlife corridors, which can all aid in how the landscape of Carmarthenshire adapts to changes in climate. • The loss of tranquil areas within Carmarthenshire and Wales presents a key risk to the county's historical landscape. The protection and maintenance of those that remain can develop the historical natural landscape while offering an opportunity for the LFRMS to implement nature-based flood management techniques within these areas. • The conservation and enhancement of the landscape of the Bannau Brycheiniog National Park can offer a wide range of environmental benefits while also contributing to the reduction of flood risk in Carmarthenshire. Nature based solutions such as reforestation and woodland management can enhance biodiversity and improve air quality, while also offering flood risk reduction through root systems aiding in the stabilisation of soil. This support can also develop resilient ecological networks at a landscape scale, enabling landscape adaptation to climate change.

5 The SEA Approach

5.1 The SEA Framework

5.1.1 The SEA Framework underpins the assessment methodology and comprises a series of Environmental Objectives (SEA Objectives) (covering environmental and some social issues) that are used to test the performance of the plan being assessed. Whilst the SEA Directive does not require the use of SEA Objectives, they are a recognised tool for undertaking the assessment and are aspirations/goals that an authority/organisation should work towards achieving. The SEA Objectives provide a means of appraising the performance of the Strategy in a consistent manner enabling its potential effects to be identified and mitigated where possible. The SEA Objectives are separate from the Strategy Objectives, although there may be some overlaps between them. To help measure the performance of the Strategy components against the SEA Objectives, it is beneficial if they are supported by a series of indicators and targets, which will be developed and reviewed as the SEA process progresses. The following section provides further details about the development of the SEA Framework.

Development of the SEA Objectives

5.1.2 The SEA Objectives have been developed using the review of other relevant plans, programmes and strategies, the baseline data and the key issues and opportunities.

5.1.3 Table 5.1 presents the proposed SEA Framework that will be used in the assessment of the LFRMS. Each of the SEA Objectives is supported by a series of guide questions to add further clarity and to assist the assessment process. Following the consultation, all SEA Objectives remained the same, however, additional decision aiding questions were included within each objective to better reflect the key issues and opportunities for the LFRMS.

Table 5.1: The proposed SEA Framework

SEA Objective	Decision aiding questions Will the Strategy…?
1. To protect and enhance biodiversity avoiding damage to or loss of designated and undesignated wildlife sites	Protect and enhance designated sites of nature conservation importance? Protect and enhance non-designated sites? Have a likely have a significant effect on protected sites and protected species?

SEA Objective	Decision aiding questions Will the Strategy…?
(SEA Topics: biodiversity, fauna and flora)	Enhance local biodiversity and geodiversity including the enhancement of networks across the region? Provide opportunities for people to access wildlife spaces? Minimise the environmental footprint of flood risk infrastructure? Minimise the effect of modifications to watercourses on biodiversity? Consider the impact of non-native invasive species as a risk to biodiversity and flooding? Deliver nature-based solutions such as Resilient Ecological Networks (RENs) to respond to environmental and climate emergencies and create more natural hydrological flow regimes? Prioritise the use of multifunctional Green and Blue Infrastructure in development proposals? Incorporate Forest Resource Plans (FRPs) to enhance the resilience of ecosystems and contribute to the reduction of flood risk? Minimise the potential effect of coastal squeeze including on the Marine Protected Area Network?
2. To improve physical and mental health and wellbeing for all and reduce health inequalities *(SEA Topics: population, human health)*	Protect and enhance public accessibility to open space? Reduce geographical inequalities amongst different groups in the community? Create, maintain, and enhance green and blue infrastructure networks? Protect and enhance key urban flood risk receptors and infrastructure? Prioritise the use of nature-based solutions and multifunctional Green and Blue Infrastructure to improve nature contact within urban environments? Maintain the connectivity of communities? Reduce the fear of flood risk and stress caused by flooding events?

SEA Objective	Decision aiding questions Will the Strategy…?
	Protect the local economy by maximising the resilience of services, sustainable transport infrastructure and accessibility networks? Encourage sustainable tourism through the creation of attractive multifunctional spaces for flood storage? Ensure that flood risk management measures reflect local population characteristics including an ageing population? Ensure that any measures of relevance are reflect the need to promote the Welsh Language? Reflect the Carmarthenshire Public Services Board (PSB) Well-being Plan to improve county-wide health, resilience, and ability to respond to climate emergencies? Integrate flood and coastal resilience into new residential infrastructure as flood risk and the demand for housing increases? Facilitate improvements to the policy and practice of flood management to ensure people are prepared for and can recover more quickly from flooding?
3. To protect and enhance water quality *(SEA Topic: water)*	Affect the quality of waterbodies and groundwater? Limit pollution of water resources? Contribute to the sustainable use of water? Seek to understand and adapt to how flood risk is predicted to increase into the future? Enhance the water quality, management, and protection of SAC rivers? Seek to meet phosphorous targets in waterbodies? Collaborate with ongoing projects to mitigate the negative effects of physical modifications to waterbodies. Utilise nature-based solutions to combat environmental emergencies such as flooding and drought? Seek to integrate nature-based solutions and SuDS into the design of new developments within catchments?

SEA Objective	Decision aiding questions Will the Strategy…?
4. To protect and enhance natural resources, including air and soil *(SEA Topics: soil, air, material assets)*	Contribute to the reduction of erosion including through the promotion of sustainable agricultural practices? Limit the pollution of soils? Limit the loss of soils through construction activities? Limit the loss of soils through flood risk? Ensure that air quality is not worsened by the development of flood risk management infrastructure? Improve air and soil quality through the creation of nature-based solutions to flood risk while offering wider benefits such as resilience during droughts? Consider the effect of active quarries on localised flood risk? Enhance the management of coal tips to reduce their impact on flooding? Enhance soil management practices to reduce flood risk? Seek to revitalise and maintain bogs and peatland? Seek to enhance the sustainable management of agricultural land? Utilise SuDS to improve flood management and protect natural resources?
5. To limit and adapt to climate change *(SEA Topic: climatic factors)*	Help the water network adapt to the predicted effects of climate change including risk of flooding and more variable weather? Contribute to the creation of renewable energy generation from water? Utilise Green and Blue Infrastructure to enhance climate resilience in urban areas? Incorporate nature-based solutions to contribute to the mitigation of climate change? Seek to develop understanding of how climate change may impact Carmarthenshire into the future?
6. To protect and enhance the historic	Conserve, protect and enhance the historic environment, heritage assets and their settings? Affect protected landscape features?

SEA Objective	Decision aiding questions Will the Strategy…?
environment, landscape and townscape *(SEA Topics: cultural heritage, including architectural and archaeological heritage and landscape)*	Maintain areas of tranquillity? Protect and enhance the landscape and townscape character of the area? Seek to collaborate with the Historic Environment Group (HEG) to enhance the understanding of environmental threats to heritage assets and mitigate these risks? Seek to locally refine the spatial mapping of Historical monuments in Wales to enhance the identification the key historical sites at risk of flooding in Carmarthenshire?

5.2 Geographical and Temporal Scope of the SEA

5.2.1 The geographical scope of the SEA will be driven by the geographical scope of the LFRMS i.e. the whole of Carmarthenshire.

5.2.2 The LFRMS is intended to apply until 2030. This timescale will be reflected in the SEA of the LFRMS. If there are likely to be any sustainability effects of the Strategy that would last longer than this, these would also be considered.

5.3 Aspects of the LFRMS to be assessed and how

5.3.1 Individual components of the LFRMS will be assessed to determine their sustainability performance and to provide recommendations for sustainability improvements. The intention will be to ensure that the process is iterative with regular feedback occurring between the strategy-developers and the SEA team as options are developed.

5.3.2 The assessment will be presented in an assessment matrix. The matrix is an established method for clearly analysing the performance of a proposal and helps meet the requirements of the SEA Regulations by ensuring that the following elements are considered. This will enable significant effects to be identified:

- Impact – whether the impact will be positive, negative or neutral when assessed against the SEA Objectives.
- Temporal scale – whether the impact will be short-term (within 5 years), occur in the medium term (5 – 10 years) or occur in the long-term (10 years +).
- Spatial scale – where the impacts will occur within the area. Any transboundary effects outside of the study area would also be considered.

- Permanency – whether effects will be permanent or temporary.
- Level of certainty – the level of certainty in the prediction will be classified as low, medium or high.
- Cumulative and synergistic effects.

5.3.3 Where negative impacts are identified, measures will be proposed to offset, avoid or otherwise mitigate for the impact. In addition, measures which may further enhance benefits will also be identified as appropriate.

5.3.4 The scoring used for the appraisal of a proposal is defined below:

Table 5.2: Notations used in the SEA assessment

Impact	Description	Symbol
Major Positive Impact	The proposal contributes strongly to the achievement of the SEA Objective.	++
Positive Impact	The proposal contributes partially to the achievement of the SEA Objective.	+
No Impact/ Neutral	There is no clear relationship between the proposal and/or the achievement of the SEA Objective or the relationship is negligible.	0
Negative Impact	The proposal partially detracts from the achievement of some elements of the SEA Objective.	-
Major Negative Impact	The proposal strongly detracts from the achievement of all elements of the SEA Objective.	--
Uncertain impact – more information required	It is not possible to determine the nature of the impact as there may be too many external factors that would influence the appraisal, or the impact may depend heavily upon implementation at the local level.	?
Positive and Negative Impacts	The proposal has a combination of both positive and negative contributions to the achievement of the SEA Objective.	+/-

5.3.5 It will be important to consider the immediate local impacts of the proposals as well as wider Carmarthenshire and regional implications. Where appropriate, the assessment will consider existing evidence and research when making linkages between new development and the types of impact this could have on different strands of the community, for example, community cohesion, equality, health etc.

5.3.6 In all cases, the assessment of proposals will make good use of the baseline data collated which will be supplemented with further detail as appropriate at the assessment stage. When assessing each element, thequestions will be asked:

- To what extent does the proposal meet the SEA Objectives?
- To what extent will the proposal seek to address key issues?
- To what extent will the proposal affect the current baseline conditions?

5.3.7 It should also be remembered that this is a strategic assessment, and it is not the intention to enter into thelevel of detail reserved for project-level Environmental Impact Assessment. All assessment will be desk-based.

5.4 Assessment of Alternatives

5.4.1 It is a requirement of the SEA Regulations that alternatives are assessed and, therefore, alternative options will be assessed using the SEA Framework. The purpose of the assessment will be to determine the sustainability strengths and weaknesses of each option such that this information can be used by the plan-makers to inform their decision to select the preferred options.

5.4.2 Each alternative option will be appraised using the same assessment matrix identified above. The table will also identify whether the site is being taken forward as a preferred option and why, or whether it is a rejected alternative and why.

6 Next Steps

6.1.1 This SEA Scoping Report has been consulted upon in accordance with the requirements of Regulation 12 of the SEA Regulations. This SEA Scoping Report was subject to a 5-week consultation with NRW and Cadw.

6.1.2 Following the receipt of the consultation responses, comments has been reviewed, and modifications have been made to the SEA Scoping Report as necessary. This is documented in Appendix C.

Appendix A

Review of Relevant Plans, Policies and Environmental Protection Objectives

January 2025

Table A-1: List of Relevant Plans, Programmes and Environmental Protection Objectives

International Plans and Programmes
United Nations (1994) The United Nations Framework Convention on Climate Change
United Nations (1997) Kyoto Protocol to the UN Framework Convention on Climate Change
United Nations (2002) The World Summit on Sustainable Development
United Nations (2006) Convention on the Rights of Persons with Disabilities
United Nations (2009) The Copenhagen Accord
United Nations (2010) Cancun Adaptation Framework
United Nations (2015) Sustainable Development Goals
United Nations (2016) Paris Agreement
United Nations (2019) The PEP Partnerships
United Nations Economic Commission for Europe (1998) The Aarhus Convention
United Nations Economic Commission for Europe (1999) The Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone
Universal Declaration of Human Rights (1948)
UK Plans and Programmes
British Red Cross (2022) Every time is Rains
Committee on Climate Change (2020) Sixth Carbon Budget
Committee on Climate Change (2021) UK Climate Risk Independent Assessment (CCRA3) Technical Report
Department for Business, Energy and Industrial Strategy (2020) The UK's Integrated National Energy and Climate Plan
Environment Agency (2010) Managing the Environment in a Changing Climate
Environment Agency (2018) The Environment Agency's Approach to Groundwater Protection V1.2
UK Health Security Agency (2023) Health Effects of Climate Change in the UK: State of the evidence 2023
HM Government (1949) National Parks and Access to the Countryside Act 1949 (last amended in December 2023)
HM Government (1981) Wildlife and Countryside Act (last amended in August 2024)
HM Government (1991) Land Drainage Act
HM Government (1991) Water Resources Act
HM Government (2020) Agriculture Act
HM Government (2002) The National Emission Ceilings Regulations 2018
HM Government (2003) The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
HM Government (2004) Civil Contingencies Act
HM Government (2006) Natural Environment and Rural Communities Act 2006
HM Government (2006) Commons Act 2006
HM Government (2007) Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended 2010)

HM Government (2008) Climate Change Act 2008
HM Government (2008) The Energy Act 2008
HM Government (2009) The Climate Change Act 2008 (2020 Target, Credit Limit and Definitions) Order 2009
HM Government (2009) The Marine and Coastal Access Act 2009
HM Government (2010) Flood and Water Management Act 2010
HM Government (2010) The Equality Act 2010
HM Government (2010) Conservation of Habitats & Species Regulations 2010 (as amended 2011)
HM Government (2010) Marine Strategy Regulations 2010
HM Government (2010) Environmental Permitting (England and Wales) Regulations
HM Government (2014) Water Act
HM Government (2015) Ozone-Depleting Substances Regulations 2015
HM Government (2017) Clean Growth Strategy
HM Government (2017) The Habitat Regulations 2017 (as amended 2019)
HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment
HM Government (2021) Net Zero Strategy: Build Back Greener
HM Government (2023) Net Zero Growth Plan and 2024 Progress Report to Parliament
HM Government (2021) The Environment Act 2021
HMG, NI Executive, Scottish Government, Welsh Government (2011) UK Marine Policy Statement
HM Treasury (2014) National Infrastructure Plan
HM Treasury (2021) Build Back Better: Our Plan for Growth
Joint Nature Conservation Committee and Defra (2012) UK Post-2010 Biodiversity Framework
Natural England and JNCC (2011) Marine Conservation Zone (MCZ) Project
NERC (2010) Marine Environmental Mapping Programme (MAREMAP)
Strategic Plan for Biodiversity 2011-2020 (2010)
UK Marine Monitoring and Assessment Strategy (2010) Charting Progress 2: The State of UK Seas
UK National Ecosystem Assessment (2011) UK National Ecosystem Assessment: Understanding Nature's Value to Society
National (Wales) Plans and Programmes
HM Government (2017) Wales Act
Welsh Government (2024) Planning Policy Wales
Welsh Government (2021) Future Wales: The National Plan 2040
Committee on Climate Change (2021) Evidence for the third UK Climate Change Risk Assessment (CCRA3): Summary for Wales
Committee on Climate Change (2021) UK Climate Change Risk Independent Assessment: Technical Report, Summary for Wales

Committee on Climate Change (2020) The path to Net Zero and progress on reducing emissions in Wales
Countryside Council for Wales (now Natural Resources Wales) (2001) Register of Landscapes of Historic Interest
Countryside Council for Wales (now Natural Resources Wales) (2015) National Seascape Assessment for Wales, LUC, NRW
Joint Nature Conservation Committee (ongoing) Geological Conservation Review
Historic Environment Group (2020) Historic Environment and Climate Change in Wales Sector Adaption Plan
National Assembly for Wales (2009) Environmental Damage (Prevention and Remediation) (Wales) Regulations 2009
National Assembly for Wales (2012) Contaminated Land (Wales) (Amendment) Regulations 2012
National Assembly for Wales (2014) Social Services and Well-being (Wales) Act 2014
National Assembly for Wales (2015) Planning (Wales) Act 2015
National Assembly for Wales (2015) Well-being of Future Generations (Wales) Act 2015
National Assembly for Wales (2016) Environment (Wales) Act 2016
National Assembly for Wales (2016) Public Health (Wales) Act
National Infrastructure Commission for Wales (2024) Building Resilience to Flooding in Wales by 2050
Natural Resources Wales (ongoing) LANDMAP Programme
Natural Resources Wales (2015) LIFE Natura 2000 Programme for Wales
Natural Resources Wales (2015) Western Wales River Basin Management Plan 2015 – 2021
Natural Resources Wales (2017) Natural Resources Policy Statement
Natural Resources Wales (2020) State of Natural Resources Report (SoNaRR) for Wales
Natural Resources Wales (2024) Long Term Investment Requirements for Flood Defenses in Wales
Natural Resources Wales (2023) National Flood Risk Management Plan and associated documents
NHS Wales (2016) Together for Health
Public Health Wales (2015) A Healthier, Happier and Fairer Wales
Public Health Wales (2018) Long Term Strategy 2018-203
Public Health Wales (2019) Our Strategic Plan 2019 – 2022
Public Health Wales (2023) Climate Change in Wales: Health Impact Assessment
Sustainable Development Commission (2009) Low Carbon Wales
The Socio-Economic Duty (2021)
Transport for Wales (2023) Climate Adaptation and Resilience Plan
Wales Council for Voluntary Action (2016) Shape Your Future - future trends: Implications for the third sector in Wales
Welsh Government (2022) The National Events Strategy for Wales 2022 to 2030
Wales Biodiversity Partnership (2010) Wales Biodiversity Framework

Welsh Government (2006) Play Policy Implementation Plan
Welsh Government (2006) Environment Strategy for Wales
Welsh Government (2007) Coastal Access Improvement Programme
Welsh Government (2007) Making the Most of Wales' Coast: The Integrated Coastal Zone Management Strategy for Wales
Welsh Government (2009) Woodlands for Wales Strategy
Welsh Government (2009) Living Well Living Independent Lives
Welsh Government (2010) Economic Renewal: A New Direction
Welsh Government (2024) Climate Adaptation Strategy for Wales
Welsh Government (2010) Low Carbon Revolution – the Welsh Government Energy Polic Statement
Welsh Government (2011) Policy Statement: Preparing for a Changing Climate
Welsh Government (2012) Energy Wales: A Low Carbon Transition
Welsh Government (2012) Sustaining a Living Wales: A Green Paper on a New Approach to Natural Resource Management in Wales
Welsh Government (2021) Wales Infrastructure Investment Strategy
Welsh Government (2020) National Strategy for Flood and Coastal Erosion Risk Management in Wales
Welsh Government (2020) Welcome to Wales: Priorities for the visitor economy 2020-2025
Welsh Government (2013) National Flood and Coastal Erosion Strategy for Wales
Welsh Government (2013) The Historic Environment Strategy for Wales
Welsh Government (2013) Vibrant and Viable Places New Regeneration Framework
Welsh Government (2014) Green Growth Wales: Investing in the Future
Welsh Government (2015) Water Strategy for Wales
Welsh Government (2017) Natural Resources Policy
Welsh Government (2017) Prosperity for All: The National Strategy
Welsh Government (2017) Prosperity for All: Economic Action Plan
Welsh Government (2018) Improving Public Transport (White Paper)
Welsh Government (2018) Valued and Resilient: The Welsh Government's Priorities for Areas of Outstanding Natural Beauty and National Parks
Welsh Government (2018) Noise and Soundscape Action Plan 2018 -2023
Welsh Government (2019) Prosperity for All: A Low Carbon Wales
Welsh Government (2019) Prosperity for All: A Climate Conscious Wales
Welsh Government (2020) Connected Communities
Welsh Government (2020) The Nature Recovery Action Plan for Wales 2020-21
Welsh Government (2021) All Wales Plan 2021-25 Working Together to Reach Net Zero
Welsh Government (2021) Net Zero Wales Carbon Budget 2 (2021 – 2025)
Welsh Government (2021) Llwybr Newydd: The Wales Transport Strategy 2021
Welsh Government (2009) TAN 5: Nature Conservation and Planning
Welsh Government (2010) TAN 6: Planning for Sustainable Rural Communities
Welsh Government (2005) TAN 8: Renewable Energy

Welsh Government (1997) TAN 10: Tree Preservation Orders
Welsh Government (1997) TAN 11: Noise
Welsh Government (2016) TAN 12: Design
Welsh Government (1997) TAN 13: Tourism
Welsh Government (1998) TAN 14: Coastal Planning
Welsh Government (2021) TAN 15: Development, Flooding, and Coastal Erosion
Welsh Government (2007) TAN 18: Transport
Welsh Government (2013) TAN 20: Planning and the Welsh Language
Welsh Government (2014) TAN 23: Economic Development
Welsh Government (2017) TAN 24: The Historic Environment
Welsh Government: Wales We Want National Conversation, 2015
Welsh Water (2008) Surface Water Management Strategy
Future Generations Commissioner for Wales: 10 Point Plan to Fund Wales' Climate Emergency, White Paper: Detailed Report, June 2019
Regional Plans and Programmes
South West Wales Energy Core Group (2022) South West Wales Energy Strategy
Welsh Government (2021) Regional Economic Framework For South West Wales
Welsh Government and the South West Wales local authorities (2021) South West Wales Regional Economic Delivery Plan
South Wales Regional Aggregates Working Party and North Wales Regional Aggregates Working Party (September 2020) The Regional Technical Statement for the North Wales and South Wales Regional Aggregate Working Parties- Second Review (RTS2)
White Consultants and Cardiff University (2017) Carmarthen Bay, Gower and Swansea Bay Local Seascape Character Assessment
Lead Local Authorities in South West Wales (2022/23) UK Shared Prosperity Funding, Investment Plan for South West Wales
Welsh Government (2022) Western Wales River Basin Management Plan 2021 - 2027
South Wales Coastal Group (2012) Shoreline Management Plan 20 – Lavernock Point to St Anne's Head
Natural Resources Wales (2023) Natural Resources Wales Flood Risk Management Plan: South West Wales Place
Natural Resources Wales (2020) Marine Area Statement
Natural Resources Wales (2020) South West Wales Area Statement
Natural Resources Wales (2024) South West Wales Area Statement
Welsh Water (2024) Water Resources Management Plan 2024
Local Plans and Programmes
Carmarthenshire Council (2014) Carmarthenshire Local Development Plan 2006 - 2021
Carmarthenshire County Council (2019) Environment Wales Act Review 2016 – 2019: Section 6
Carmarthenshire Nature Partnership (2020) Nature in Carmarthenshire ...our approach for local action 2020 – 2030
Carmarthenshire Nature Partnership (2024) State of Nature Report 2024

Carmarthenshire Public Service Board (2023) Well-being Plan 2023 - 2028
Carmarthenshire County Council (2019) Forward Plan for Environment (Wales) Act 2016
Carmarthenshire County Council (2013) Local Flood Risk Management Strategy
Carmarthenshire County Council (2020) Route towards becoming a Net Zero Carbon Local Authority by 2030
Carmarthenshire County Council (2022) Strategy for Greening 8 Towns in Carmarthenshire
Carmarthenshire County Council (2023) Revised Local Development Plan 2018 - 2033: Green and Blue Infrastructure Assessment – Technical Report
Natural Resources Wales (2014) Carmarthen Bay Abstraction Licensing Strategy

Review of Relevant Plans, Policies and Environmental Protection Objectives

Table A.1 summarises the outcomes of the review of International, UK, Wales, Regional and Local plans, policies and environmental protection objectives. This identified key themes and the implications for the SEA and the LFRMS, as well as illustrating how these link to the development of the SEA Framework.

Table A.1: Sustainability themes linked to the SEA objectives

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
Biodiversity	The United Nations Framework Convention on Climate Change, Kyoto Protocol to the UN Framework Convention on Climate Change, Declaration of Human Rights, The Aarhus Convention, The Copenhagen Accord, Cancun Adaptation Framework (2010), Paris Agreement (2016), The world Summit on Sustainable Development (2002), Sustainable Development Goals (2015), The Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone	Wildlife and Countryside Act 1981; Natural Environment and Rural Communities Act 2006; Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended 2010); Conservation of Habitats & Species Regulations 2010 (as amended 2011); The UK Post-2010 Biodiversity Framework; Charting Progress 2: The State of UK Seas; Net Zero Growth Plan; UK National Ecosystem Assessment: Understanding Nature's Value to Society; The Paris Agreement; Joint Nature Conservation Committee and Defra (2012) UK Post-2010 Biodiversity Framework; Conserving Biodiversity the UK Approach; Joint Nature Conservation Committee (2012) The UK Post-2010 Biodiversity Framework; Strategic Plan for	Woodlands for Wales Strategy; Wales Biodiversity Framework; UK Climate Change Risk Assessment 2017 Evidence Report; National Seascape Assessment for Wales; Planning (Wales) Act 2015; Draft NRP; Water Strategy for Wales; Surface Water Management Strategy; TAN 5: Nature Conservation and Planning; TAN 10: Tree Preservation Orders; Nature Recovery Action Plan (2020); Western Wales River Basin Management Plan; Welsh Government Natural Resources Policy 2017; Planning Policy Wales (as amended 2024);	Carmarthen Bay, Gower and Swansea Bay Local Seascape Character Assessment, Shoreline Management Plan 20 – Lavernock Point to St Anne's Head, Natural Resources Wales Flood Risk Management Plan: South West Wales Place, South West Wales Area Statement, Water Resources Management Plan 2024, Western Wales River Basin Management Plan 2021 – 2027; Natural Resources Wales (2020) Marine Area Statement	Carmarthenshire Local Development Plan 2006 – 2021, Nature in Carmarthenshire ...our approach for local action 2020 – 2030, Forward Plan for Environment (Wales) Act 2016, Local Flood Risk Management Strategy; Carmarthenshire County Council (2019) Environment Wales Act Review 2016 – 2019: Section 6; Carmarthenshire Nature Partnership (2024) State of Nature Report 2024;	The LFRMS should seek to support net benefit for Biodiversity and Ecosystems Resilience where possible. The design of new flood management infrastructure should retain and enhance biodiversity and habitats and the LFRMS should reflect this, with no interventions resulting in a net loss of biodiversity.	The SEA Framework should include objectives that seek to conserve and enhance biodiversity, species and habitats as part of a wider aim to protect and enhance ecosystems services.	1

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
		Biodiversity 2011-2020 (2010); Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended 2010); Conservation of Habitats & Species Regulations 2010 (as amended 2011); National Parks and Access to the Countryside Act 1949; Environment Act 2021; The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017; HMG, NI Executive, Scottish Government; Inshore Fisheries and Conservation Authorities Bylaws (various); Natural England and JNCC (2011) Marine Conservation Zone (MCZ) Project; NERC (2010) Marine Environmental Mapping Programme (MAREMAP)	Natural Resources Wales (2020) State of Natural Resources Report (SoNaRR) for Wales.		Carmarthenshire County Council (2022) Strategy for Greening 8 Towns in Carmarthenshire; Carmarthenshire County Council (2023) Revised Local Development Plan 2018 - 2033: Green and Blue Infrastructure Assessment – Technical Report			
Population	The United Nations Framework Convention on Climate Change, Kyoto Protocol to the UN Framework Convention on Climate Change, Declaration of	The UK's Shared Framework for Sustainable Development; National Parks and Access to the Countryside Act 1949;	PPW edition 12; TAN18; TAN6- Planning for Sustainable Rural Communities; Well-being of Future Generations Act;	South West Wales Area Statement, Investment Plan for South West Wales, South West Wales Energy Strategy, Regional	Carmarthenshire Local Development Plan 2006 - 2021	The LFRMS should enhance and maintain sustainable connectivity between communities	The SEA Framework should include sub-objectives which promote equality and	2

Review of Relevant Plans, Policies and Environmental Protection Objectives

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
	Human Rights, The Aarhus Convention, The Copenhagen Accord, Cancun Adaptation Framework (2010), Convention on the Rights of Persons with Disabilities, Paris Agreement (2016), The PEP Partnerships, The World Summit on Sustainable Development (2002), Sustainable Development Goals (2015), The Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone	Achieving Equal Access for Disabled People (2018)	Wales Transport Strategy; Active Travel (Wales) Act 2013; Active Travel Action Plan for Wales; Planning (Wales) Act 2015; Improving Public Transport (White Paper); The Future Development of Transport for Wales	Economic Framework For South West Wales, South West Wales Regional Economic Delivery Plan, The Regional Technical Statement for the North Wales and South Wales Regional Aggregate Working Parties- Second Review (RTS2), Western Wales River Basin Management Plan 2021 – 2027, Shoreline Management Plan 20 – Lavernock Point to St Anne's Head, Natural Resources Wales Flood Risk Management Plan: South West Wales Place, Water Resources Management Plan 2024		where possible through the development of flood management infrastructure. Further than the development of flood management infrastructure, the LFMRS should seek to enhance community resilience to flooding through educating and empowering the population to adapt to flooding events.	cohesive communities.	

Review of Relevant Plans, Policies and Environmental Protection Objectives

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
Human Health	The United Nations Framework Convention on Climate Change, Kyoto Protocol to the UN Framework Convention on Climate Change, Declaration of Human Rights, The Aarhus Convention, The Copenhagen Accord, Cancun Adaptation Framework (2010), Convention on the Rights of Persons with Disabilities, Paris Agreement (2016), The PEP Partnerships, The World Summit on Sustainable Development (2002), Sustainable Development Goals (2015), The Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone	Health Effects of Climate Change in the UK: State of the evidence 2023; Sustainable Development: The Key to Tackling Health Inequalities, Shared Framework for Sustainable Development; British Red Cross (2022) Every time it rains; HM Government (2004) Civil Contingencies Act	PPW edition 12; Play Policy Implementation Plan; National Energy Efficiency Action Plan; One Wales, One Planet, Towards Zero Waste; Active Travel (Wales) Act 2013; Well-being of Future Generations (Wales) Act 2015; UK Climate Change Risk Assessment 2017 Evidence Report; Planning (Wales) Act 2015; TAN 11: Noise, Public Health Wales - Our Strategic Plan 2019 – 2022; Noise and Soundscape Action Plan 2018 - 2023	South West Wales Area Statement, Investment Plan for South West Wales, South West Wales Energy Strategy, Regional Economic Framework For South West Wales, South West Wales Regional Economic Delivery Plan, The Regional Technical Statement for the North Wales and South Wales Regional Aggregate Working Parties- Second Review (RTS2), Western Wales River Basin Management Plan 2021 – 2027, Shoreline Management Plan 20 – Lavernock Point to St Anne's Head, Natural Resources Wales Flood Risk Management Plan:	Carmarthenshire Local Development Plan 2006 – 2021; Carmarthenshire Public Service Board (2023) Well-being Plan 2023 – 2028; Carmarthenshire County Council (2022) Strategy for Greening 8 Towns in Carmarthenshire; Carmarthenshire County Council (2023) Revised Local Development Plan 2018 - 2033: Green and Blue Infrastructure Assessment – Technical Report	The LFRMS should recognise the potential for integrating national green spaces as places into water and flood risk management infrastructure for health and recreation, connecting habitats and supporting community interaction. The LFMRS should also recognise the potential to enhance and maintain human health and wellbeing through improved flood management, infrastructure, and community resilience, thereby reducing stress induced by flood risk and the potential physical harm flooding may cause.	The SEA Framework should include objectives that promote healthy lifestyles and improvement to mental well-being.	2

SEA Topics	Source					Implications for the LFRMS	Implications for the SEA	Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local			
				South West Wales Place, Water Resources Management Plan 2024				
Soil	The United Nations Framework Convention on Climate Change, Kyoto Protocol to the UN Framework Convention on Climate Change, Declaration of Human Rights, The Copenhagen Accord, Cancun Adaptation Framework (2010), Paris Agreement (2016), The world Summit on Sustainable Development (2002), Sustainable Development Goals (2015), The Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone	Environment Act 2021	Environment Strategy for Wales; Surface Water Management Strategy; UK Climate Change Risk Assessment 2017 Evidence Report; Planning (Wales) Act 2015; Woodlands for Wales Strategy; Nature Recovery Action Plan (2020); Western Wales River Basin Management Plan	South West Wales Area Statement, Western Wales River Basin Management Plan 2021 – 2027, Shoreline Management Plan 20 – Lavernock Point to St Anne's Head, Water Resources Management Plan 2024, Natural Resources Wales Flood Risk Management Plan: South West Wales Place, Carmarthen Bay, Gower and Swansea Bay Local Seascape Character Assessment	Carmarthenshire Local Development Plan 2006 – 2021, Nature in Carmarthenshire ...our approach for local action 2020 – 2030, Forward Plan for Environment (Wales) Act 2016, Local Flood Risk Management Strategy	The LFRMS should recognise the potential utilisation of soil as a nature-based solution to reducing flood risk, which has wider environmental benefits such as reduced water pollution, soil erosion prevention and enhanced ecosystem resilience. The LFRMS should ensure soil resources are not adversely affected by flood management infrastructure.	The SEA Framework should include objectives with a focus on the protection of soil resources.	4
Water	The United Nations Framework Convention on Climate Change, Kyoto Protocol to the	Flood and Water Management Act 2010; Net Zero Growth Plan; The Marine and Coastal Access	PPW edition 12;Welsh Government (2021) TAN 15: Development, Flooding, and Coastal	Western Wales River Basin Management Plan 2021 – 2027,	Carmarthenshire Local Development Plan, Nature in	The LFRMS should use natural features that contribute to flood	The SEA Framework should include objectives that to	3

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
	UN Framework Convention on Climate Change, Declaration of Human Rights, The Copenhagen Accord, Cancun Adaptation Framework (2010), Paris Agreement (2016), The world Summit on Sustainable Development (2002), Sustainable Development Goals (2015), The Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone	Act 2009; Environment Act 2021; The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017; Sustainable Development Commission (2005) One Future – Different Paths; Shared Framework for Sustainable Development; HM Government (1991) Land Drainage Act; HM Government (1991) Water Resources Act; HM Government (2014) Water Act	Erosion ; National Flood and Coastal Erosion Strategy for Wales; Coastal Access Improvement Programme; Making the Most of Wales' Coast: The Integrated Coastal Zone Management Strategy for Wales; UK Climate Change Risk Assessment 2017 Evidence Report; National Seascape Assessment for Wales; Planning (Wales) Act 2015; Welsh Government Strategic Policy Position on Water; Water Strategy for Wales; Surface Water Management Strategy; TAN 14: Coastal Planning; Western Wales River Basin Management Plan; National Infrastructure Commission for Wales (2024) Building Resilience to Flooding in Wales by 2050; Natural Resources	Shoreline Management Plan 20 – Lavernock Point to St Anne's Head, Natural Resources Wales Flood Risk Management Plan: South West Wales Place, Water Resources Management Plan 2024; Natural Resources Wales (2020) Marine Area Statement	Carmarthenshire ...our approach for local action, Forward Plan for Environment (Wales) Act 2016, Local Flood Risk Management Strategy; Natural Resources Wales (2014) Carmarthen Bay Abstraction Licensing Strategy	management to reduce flood risk and coastal erosion. Optioneering and design should seek to adapt to the risk of flooding when determining the location and design of new flood risk infrastructure. The LFRMS should seek opportunities to protect and improve the quality of water resources. The sustainable use of water should also be considered.	seek to ensure that flood risk is reduced and ensure that the quality of water resources is protected and improved.	

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
			Wales (2024) Long Term Investment Requirements for Flood Defences in Wales; Natural Resources Wales (2023) National Flood Risk Management Plan and associated documents; Welsh Government (2020) National Strategy for Flood and Coastal Erosion Risk Management in Wales					
Air	The United Nations Framework Convention on Climate Change, Kyoto Protocol to the UN Framework Convention on Climate Change, Declaration of Human Rights, The Copenhagen Accord, Cancun Adaptation Framework (2010), Paris Agreement (2016), The world Summit on Sustainable Development (2002), Sustainable Development Goals (2015), The Gothenburg Protocol to Abate	The National Adaptation Programme: Making the Country Resilient to a Changing Climate; Net Zero Growth Plan; Delivering a Sustainable Transport System; Managing the Environment in a Changing Climate; Climate Change Act 2008; Environment Act 2021	Environment (Wales) Act 2016; Environment Strategy for Wales; Low Carbon Revolution – the Welsh Government Energy Policy Statement; Policy Statement: Preparing for a Changing Climate; A Climate Conscious Wales; Energy Wales: A Low Carbon Transition; Wales Transport Strategy; Well-being of Future Generations (Wales) Act 2015; UK Climate Change Risk	South West Wales Energy Strategy; Regional Economic Framework For South West Wales; South West Wales Regional Economic Delivery Plan; South West Wales Area Statement	Carmarthenshire Local Development Plan 2006 – 2021, Nature in Carmarthenshire ...our approach for local action 2020 – 2030, Forward Plan for Environment (Wales) Act 2016	The LFRMS should ensure that any the construction and operation of any proposed development would not lead to a worsening of local air quality.	The SEA Framework should include sub-objectives that seek to ensure flood risk development does not worsen local air quality.	4

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
	Acidification, Eutrophication and Ground-level Ozone		Assessment 2017 Evidence Report, summary for Wales; Low Carbon Wales; Active Travel (Wales) Act 2013; Planning (Wales) Act 2015; TAN 18: Transport; Prosperity for All: A Low Carbon Wales, Public Health Wales (2018) Long Term Strategy, Public Health Wales (2019), Our Strategic Plan 2019 – 2022					
Climatic Factors	The United Nations Framework Convention on Climate Change, Kyoto Protocol to the UN Framework Convention on Climate Change, Declaration of Human Rights, The Aarhus Convention, The Copenhagen Accord, Cancun Adaptation Framework (2010), Paris Agreement (2016), The world Summit on Sustainable Development (2002), Sustainable Development Goals	Health Effects of Climate Change in the UK: State of the evidence 2023; Net Zero Growth Plan; Climate Change Act 2008; The Climate Change Act 2008 (2020 Target, Credit Limit and Definitions) Order 2009, Water Resources Strategy for England and Wales, EA's Approach to Groundwater Protection V1.2, A Green Future (2018); Environment Act 2021, The Water Environment (Water Framework Directive) (England and Wales)	Environment Strategy for Wales; Energy Policy Statement; One Wales, One Planet; Surface Water Management Strategy; TAN6-Planning for Sustainable Rural Communities Energy White Paper: Our Energy Future; Climate Change Wales; Well-being of Future Generations (Wales) Act 2015; A Climate Conscious Wales. Energy Wales A Low Carbon	South West Wales Energy Strategy, Investment Plan for South West Wales, Natural Resources Wales Flood Risk Management Plan: South West Wales Place, South West Wales Area Statement, Water Resources Management Plan 2024, Western Wales River Basin	Carmarthenshire Local Development Plan 2006 – 2021, Nature in Carmarthenshire ...our approach for local action 2020 – 2030, Forward Plan for Environment (Wales) Act 2016; Carmarthenshire County Council (2020) Route towards becoming a Net	Further understanding of how Carmarthenshire will be affected by climate change and investment into future water management strategies should be sought within the LFMRS. The LFRMS should highlight the importance of managing and seeking to mitigate the consequences	The SEA Framework should include objectives that address climate change issues.	5

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
	(2015), The Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone	Regulations 2017; Ozone-Depleting Substances Regulations 2015; One Future – Different Paths. Shared Framework for Sustainable Development	Transition; UK Climate Change Risk Assessment 2017 Evidence Report; Low Carbon Wales, Planning (Wales) Act 2015; Woodlands for Wales Strategy; Welsh Government Strategic Policy Position on Water; Sustaining a Living Wales: A Green Paper on a New Approach to Natural Resource Management in Wales; Water Strategy for Wales; Surface Water Management Strategy; Final Water Resources Management Plan; Catchment Abstraction Management Strategies; Natural Resources Policy (2017); Prosperity for All: A Low Carbon Wales; Nature Recovery Action Plan (2020); 10 Point Plan to Fund Wales' Climate Emergency Future Generations	Management Plan 2021 - 2027	Zero Carbon Local Authority by 2030	of climate change by building resilience into the natural and built environment, and should recognise the potential to adapt Carmarthenshire to the risk of increasing rainfall and frequency of flooding events into the future.		

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
			Commissioner for Wales, White Paper: Detailed Report, June 2019; Public Health Wales (2023) Climate Change in Wales: Health Impact Assessment: Transport for Wales (2023) Climate Adaptation and Resilience Plan; Welsh Government (2024) Climate Adaptation Strategy for Wales.					
Economy	The United Nations Framework Convention on Climate Change, Kyoto Protocol to the UN Framework Convention on Climate Change, Declaration of Human Rights, The Aarhus Convention, The Copenhagen Accord, Cancun Adaptation Framework (2010), Convention on the Rights of Persons with Disabilities, Paris Agreement (2016), The PEP Partnerships, The World Summit on	Build Back Better: Our Plan for Growth; National Infrastructure Plan; Transport Investment Strategy – Moving Britain Forward (2017); Transport Infrastructure Efficiency Strategy (2017); Net Zero Growth Plan; Industrial Strategy (2017); Clean Growth Strategy (2017)	PPW edition 12; Welcome to Wales: Priorities for the visitor economy 2020-2025; Wales – A Better Country, Well-being of Future Generations (Wales) Act 2015; Natural Resources Policy Statement; Planning (Wales) Act 2015; Sustaining a Living Wales: A Green Paper on a New Approach to Natural Resource Management in Wales; Wales	South West Wales Energy Strategy, Regional Economic Framework For South West Wales, Investment Plan for South West Wales, South West Wales Regional Economic Delivery Plan, The Regional Technical Statement for the North Wales and South Wales Regional Aggregate Working	Carmarthenshire Local Development Plan 2006 - 2021	The LFRMS should ensure that flood management infrastructure will promote economic prosperity and not be detrimental to the development of new employment opportunities.	The SEA Framework should include criteria to ensure that the wellbeing of people is maintained through ensuring that the economy is protected through flood risk management measures.	2

Review of Relevant Plans, Policies and Environmental Protection Objectives

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
	Sustainable Development (2002), Sustainable Development Goals (2015), The Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone		Infrastructure Investment Strategy; TAN 4: Retail and Commercial Development; TAN 20: Planning and the Welsh Language; TAN 23: Economic Development; Prosperity for All: National Strategy; Prosperity for All: Economic Action Plan	Parties- Second Review (RTS2), South West Wales Area Statement				
Cultural Heritage and Archaeology	The Copenhagen Accord, Cancun Adaptation Framework (2010), Paris Agreement (2016), The World Summit on Sustainable Development (2002), Sustainable Development Goals (2015)	National Infrastructure Plan, The Environment Act 2021; Commons Act 2006	TAN13 – Tourism, Cultural Tourism Strategy for Wales; Planning (Wales) Act 2015; Wales Infrastructure Investment Strategy; Draft International Strategy	Carmarthen Bay, Gower and Swansea Bay Local Seascape Character Assessment, Shoreline Management Plan 20 – Lavernock Point to St Anne's Head	Carmarthenshire Local Development Plan 2006 – 2021, Nature in Carmarthenshire ...our approach for local action 2020 – 2030, Forward Plan for Environment (Wales) Act 2016	The LFRMS should protect and retain distinctiveness of valued historic environment and cultural heritage and its setting and improve access to cultural facilities for citizens and visitors.	The SEA Framework should include sub-objectives that seek to protect local distinctiveness of the historic environment.	6
Landscape	The Copenhagen Accord, Cancun Adaptation Framework (2010), Paris Agreement (2016), The World Summit on Sustainable Development (2002), Sustainable	Environment Act 2021; Commons Act 2006, National Infrastructure Plan,	PPW edition 12; TAN12 – Design; Register of Landscapes of Historic Interest; Historic Environment (Wales) Act 2016; UK Climate Change Risk	Carmarthen Bay, Gower and Swansea Bay Local Seascape Character Assessment, Shoreline Management Plan	Carmarthenshire Local Development Plan 2006 – 2021, Nature in Carmarthenshire ...our approach for local action	The LFRMS should protect and retain distinctiveness of the national landscapes and improve access to valued landscapes	The SEA Framework should include sub-objectives that seek to protect local landscapes.	6

Review of Relevant Plans, Policies and Environmental Protection Objectives

SEA Topics	Source							Relevant SEA Objective
	International	National (UK)	Wales	Regional	Local	Implications for the LFRMS	Implications for the SEA	
	Development Goals (2015)		Assessment 2017 Evidence Report; National Seascape Assessment for Wales; Planning (Wales) Act 2015; Valued and Resilient: The Welsh Government's Priorities for Areas of Outstanding Natural Beauty and National Parks	20 – Lavernock Point to St Anne's Head; Natural Resources Wales (2020) South West Wales Area Statement	2020 – 2030, Forward Plan for Environment (Wales) Act 2016	for citizens and visitors.		

Appendix B

The Sustainability Baseline and Key Issues and Opportunities

February 2025

CONTENTS

1 Biodiversity, Flora and Fauna

1.1 Designated Sites

Special Protection Areas

1.1.1 Carmarthen Bay Special Protection Area (SPA) is located to the south of Carmarthen between Tenby Penally and Llangennith[1]. The site is designated for its extensive areas of coastal priority habitat and ability to support a significant presence of waterfowl and seabirds year-round. Elenydd – Mallaen SPA is one of the most ornithologically important areas of hill land in Wales. It is most notably designated for its ability to support nationally important breeding populations of two Annex 1 bird species (Red Kite, and Merlin) and its prominent carrion-feeding bird community, and is located in the north of Carmarthenshire to the east of Aberystwyth[2]. Burry Inlet SPA is designated for its ability to support over 20,000 waterfowl and nationally important wintering populations of migratory waterfowl and is located between the Gower Peninsula and Llanelli[3].

Special Areas of Conservation

1.1.2 Eight Special Areas of Conservation (SACs) are located throughout Carmarthenshire[4]: Caeau Mynydd Mawr, Carmarthen Bay and Estuaries, Carmarthen Bay Dunes, Cernydd Carmel, Cleddau Rivers, Mynydd Mallaen, River Teifi, and River Taywi (all of which are designated for the presence of internationally threatened habitats and species including Otters, various Lamprey, and Watercourses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation)[5].

Ramsar Sites

1.1.3 There is a single Ramsar Site (Burry Inlet) in Carmarthenshire, designated for its extensive areas of intertidal sand and mud flats, large sand dune systems, and the largest continuous area of saltmarsh in Wales (2,200ha)[6] [7].

Sites of Special Scientific Interest

1.1.4 Carmarthenshire contains 89 SSSIs[8]. Spanning over 15,300ha and including habitats such as Ancient Woodland, flower-rich meadows, wetlands, and disused quarries, they support plant and animal species which are not often seen in the wider countryside[9]. A further nine are also found between

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[1] Protected Planet (2024). Available at: https://www.protectedplanet.net/555556921 [Date Accessed: 25.11.24]
[2] NRW (2024) Find protected areas of land and sea – Special Protection Areas. Available at: https://naturalresources.wales/media/632578/SPA_UK9014111_Register_Entry_EN001.pdf [Date Accessed: 25.11.24]
[3] NRW (2024) Find protected areas of land and sea. Available at: https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en [Date Accessed: 25.11.24]
[4] The Nature Partnership (2024) Carmarthenshire's State of Nature Report. Available at: Carms-SoN-summary-doc-ENG.pdf [Accessed: 17.01.25]
[5] Carmarthenshire Council (2025) Protected sites. Available at: https://www.carmarthenshire.gov.wales/home/council-services/planning/biodiversity/protected-sites/ [Accessed: 17.01.25]
[6] JNCC (2022) Designated and Proposed Ramsar Sites in the UK, and the UK's Overseas Territories & Crown Dependencies. Available at: https://jncc.gov.uk/our-work/ramsar-sites/#wales [Date Accessed: 26.11.24]
[7] NRW (2024) Find protected area of land and sea – Ramsar Sites. Available at: https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en [Date Accessed: 26.11.24]
[8] Carmarthenshire Council (2025) Protected sites. Available at: https://www.carmarthenshire.gov.wales/home/council-services/planning/biodiversity/protected-sites/ [Accessed: 17.01.25]
[9] Carmarthenshire County Council (2024) Protected sites. Available at: https://www.carmarthenshire.gov.wales/home/council-services/planning/biodiversity/protected-sites/ [Date Accessed: 26.11.24]

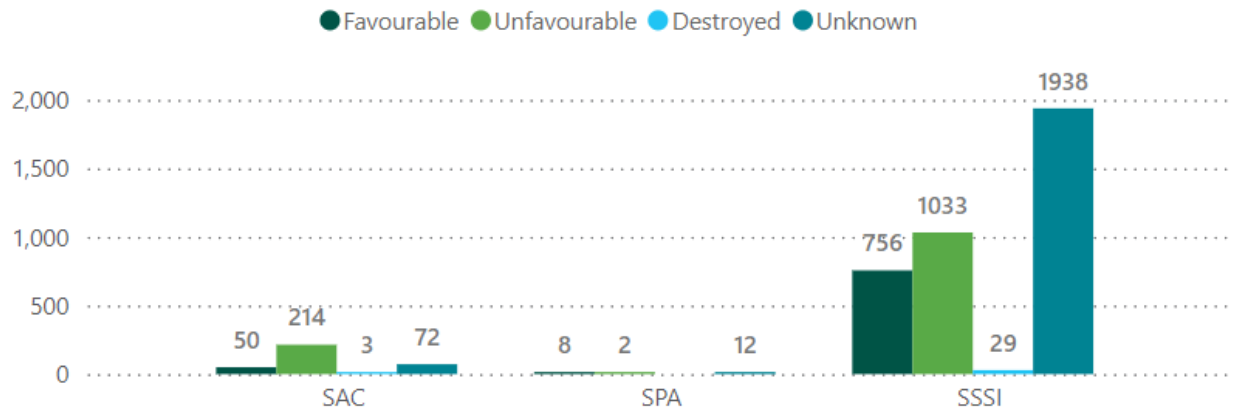
Carmarthenshire and neighbouring counties including Swansea, Ceredigion, and Pembrokeshire[Error! Bookmark not defined.].

Marine Protected Areas

1.1.5 Marine Protected Areas (MPAs) in Carmarthenshire include sites of European and International Importance (SPAs, SACs, Ramsar Sites), and SSSIs which cover the seashore or sea. [10] These include Blurry Inlet Ramsar Site, Bristol Channel Approaches SAC, Carmarthen Bay and Estuaries SAC, and Carmarthen Bay Dunes SAC**Error! Bookmark not defined.**.

1.1.6 For Wales's designated sites (SSSI ,SAC, SPA), an estimated 20% of these features were in a favourable condition, with 30% in an unfavourable condition as of 2020,[22] as shown in Figure B-1 below.

Figure B-1: Indicative condition of Carmarthenshire's natural features by designation type



Source: Natural Resources Wales (2024)

National Nature Reserves

1.1.7 There are five National Nature Reserves (NNRs) located in Carmarthenshire[11], including Allt Rhyd Y Groes within the northeastern most area of the county, which spans approximately 70ha[12] and features a variety of habitat including heathland, grassland, and woodland[12]. Also present are Dinefwr Estate, Carmel, and Waun Las to the Southeast and Cors Goch Llanllwch, which are located centrally to the Southwest[11].

Locally Designated Sites

1.1.8 Six Local Nature Reserves (LNRs) are found in Carmarthenshire, all of which are managed with the conservation of wildlife as the key focus. This includes Morfa Berwig, Pembray Burrows and Saltings, Ashpits Pond and Pwll Lagoon, North Dock Dunes, Carreg Cennen, and Slan-yr-Afon, Kidwelly. Each are important to local communities by enabling contact with the natural environment, whilst supporting a rich variety of wildlife and/or geological features[5].

[10] NRW (2024) Marine Protected Areas. Available at: https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/marine-protected-areas/?lang=en [Accessed: 26.11.24]
[11] MAGIC Maps (2024). Available at: https://magic.defra.gov.uk/MagicMap.aspx [Accessed: 26.11.24]
[12] Woodland Trust (no date). Available at: https://www.woodlandtrust.org.uk/visiting-woods/woods/allt-rhyd/ [Accessed: 26.11.24]

1.1.9 While SINCs do not benefit from statutory protection (unless they are also designated as SSSIs or LNRs), they are designed to provide comprehensive coverage of areas with significant nature conservation value. Local authorities are therefore expected to consider the importance of protecting these sites when formulating planning and development policies[13].

1.2 Habitats and Species

1.2.1 Agriculture in Carmarthenshire dominates the rural landscape. According to Agricultural Land Classification, 203,700ha of land within Carmarthenshire is classified as agricultural land, with the majority classified as grade 3a and 3; with a small tranche of grade 2 land in the southeast of the county[14]. Carmarthenshire also holds various coastal, freshwater, lowland, upland, wetland, grassland, and woodland priority habitat including blanket bog, coastal saltmarshes, lowland heathland, upland mixed ashwoods, wet woodland, and lowland mixed deciduous woodland[15].

1.2.2 Carmarthenshire is home to 44 priority species[16]. The species considered by Welsh Government to be of key significance to maintain and enhance biodiversity in the county are: water vole, barbastelle bat, European hedgehog, brown hare, otter, pine marten, harvest mouse, dormouse, polecat, noctule bat, soprano pipistrelle bat, brown long-eared bat, greater and lesser horseshoe bat, red squirrel and common pipistrelle bat[16]. There are also six priority fish species found within Carmarthenshire, which includes European eel, allis shad, river lamprey, sea lamprey, Atlantic salmon, and sea trout[17].

1.2.3 There are several areas of Ancient Woodland in Carmarthenshire. One of the largest segments of Ancient Woodland in the County (42ha) is Coed Tregib, situated east of Carmarthen. It includes over 100 plant species and consists of a majority of broadleaved woodland, marshland, and grassland[18]. Other instances of Ancient Woodland include Green Castle Woods and Coed Ystrad[19].

1.2.4 Multiple areas of lowland grassland and heathland habitat are present in Carmarthenshire, with each supporting a rich community of plant and animal species. Relating to seven variations of priority habitat in Wales, these habitats all contribute to ecological diversity within Carmarthenshire, and are home to some of the most important and declining species in the county[20]. Twenty-five of these areas are managed as part of Carmarthenshire's Marsh Fritillary Project, which is dedicated to the protection of the protected butterfly[21].

1.3 Data Gaps

[13] NRW (2023) Sites of Importance for Nature Conservation (SINC). Available at: https://metadata.naturalresources.wales/geonetwork/srv/api/records/EXT_DS121617 [Accessed: 17.01.25]
[14] Carmarthenshire County Council (2023) Carmarthenshire – Second Deposit LDP. Available at: https://carmarthenshire.oc2.uk/document/14/6061 [Accessed: 26.11.24]
[15] Carmarthenshire County Council- Priority Habitats in Carmarthenshire (2023). Available at: https://www.carmarthenshire.gov.wales/home/council-services/planning/biodiversity/priority-habitats-in-carmarthenshire/ [Accessed: 26.11.24]
[16] Nature Partnership (no date) Carmarthenshire Nature Recovery Plan – Mammals. Available at: https://www.carmarthenshire.gov.wales/media/1216549/mammals-priority-species-in-carms.pdf [Accessed: 26.11.24]
[17] Carmarthenshire state of nature – Section 7 'Priority' Fish. Available at: https://www.carmarthenshire.gov.wales/media/mgyhlcct/carms-son-fish-2024.pdf [Date Accessed: 26.11.24]
[18] The Woodland Trust – Coed Tregib (no date). Available at: https://www.woodlandtrust.org.uk/visiting-woods/woods/coed-tregib/ [Accessed: 26.11.24]
[19] The Woodland Trust (no date). Available at: https://www.woodlandtrust.org.uk/ [Accessed: 26.11.24]
[20] Gov.Wales (2015) Carmarthenshire LBAP – Lowland Grassland and Heathland Habitats Grouped Action Plan. Available at: https://www.carmarthenshire.gov.wales/media/3444/lowland_grassland_and_heathland_hap-r.pdf [Accessed: 16.01.25]
[21] Carmarthenshire County Council (2025) Caeau Mynydd Mawr Marsh Fritillary Project. Available at: https://www.carmarthenshire.gov.wales/council-services/planning/biodiversity/marsh-fritillary-project/ [Accessed: 16.01.25]

- Insufficient evidence to determine the condition of around half of the features on Wales's Designated Sites, including all Ramsar Sites[22]. Specific information on the condition of the protected sites in Carmarthenshire. The condition of Wales's designated sites was assessed once prior to 2020, in 2003, though the 2003 baseline assessment is not publicly available. This restricts analysis of how Wales's baseline conditions have improved or deteriorated over time. Due to Natural Resources Wales only determining the condition of around half of the countries' protected site features, the 2020 Protected Sites Baseline Assessment includes insufficient evidence, reducing the quantity of valid findings for Carmarthenshire's nationally protected sites.
- Information on SINC designations in Carmarthenshire.

1.4 Key Issues and Opportunities

- Key pressures to Carmarthenshire's biodiversity include water and air pollution capable of adversely affecting biodiversity; flash flooding with the potential to harm aquatic ecosystems; changes to microclimate which have the potential to alter the performance of some species of plants and animals; exploitation of marine and coastal environments; habitat loss and fragmentation and pressure from development[23]. Resilient Ecological Networks (RENs) offer a key opportunity to respond to these threats. Focusing on nature recovery, which is vital to rebuilding ecological resilience, RENs expand, connect, and manage protected areas, promoting species movement, habitat resilience, and offering a nature based solution to environmental and climate emergencies such as flooding[24].
- Coastal squeeze is a significant challenge for Marine Protected Areas (MPAs) in Carmarthenshire, with projections indicating a loss of 93 hectares of saltmarsh in Carmarthen Bay by 2155[25]. The Shoreline Management Plan (SMP) is a critical policy framework for addressing risks associated with coastal flooding and erosion, offering large-scale assessments to guide sustainable management of the coastline. By fostering collaboration between the SMP and the LFRMS, there is an opportunity to mitigate the impacts of coastal squeeze, reduce flood risk, and enhance the protection of Carmarthenshire's MPAs[26].
- Non-native, invasive plant species on watercourses present a key risk to biodiversity and flooding in Carmarthenshire. Aquatic species such as Parrot's Feather and New Zealand Pygmy weed have the ability to rapidly dominate a waterbody, contributing to the crowding out of native species and the destabilisation of riverbanks. This potentially increases the risk of flooding and harm to local biodiversity[27][28].
- In order to accommodate urban and industrial developments, some watercourses within Carmarthenshire have been confined or re-routed (most notably the Dafen and Lliedi rivers in Llanelli)[29]. Physical modifications are a primary pressure to ecology within watercourses, and it is

[22] NRW (2024) Protected sites baseline assessment 2020. Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/protected-sites-baseline-assessment-2020/?lang=en [Accessed: 26.11.24]
[23] Carmarthenshire County Council – The State of Nature in Carmarthenshire (2024). Available at: https://www.carmarthenshire.gov.wales/council-services/planning/biodiversity/the-state-of-nature-in-carmarthenshire/ [Accessed: 26.11.24]
[24] NRW (2024) Practitioners Guide to Resilient Ecological Networks. Available at: https://naturalresources.wales/guidance-and-advice/environmental-topics/land-management/practitioners-guide-to-resilient-ecological-networks/?lang=en [Accessed: 17.01.25]
[25] Natural Resources Wales (2024) Understanding the likely scale of deterioration of Marine Protected area features due to Coastal Squeeze; Volume 2. Available at: https://naturalresourceswales.gov.uk/media/e3cee2t3/r4537_vol1_coastal-squeeze-methodology_final.pdf [Accessed: 16.01.25]
[26] Welsh Government (2023) Shoreline Management and coastal adaptation in Carmarthnshire. Available at: https://democracy.carmarthenshire.gov.wales/documents/s81214/Report.pdf [Accessed: 21.01.25]
[27] The Nature Partnership (2020) Carmarthenshire Nature Recovery Plan. Available at: https://www.carmarthenshire.gov.wales/media/1216364/freshwater-habitats-new.pdf [Accessed: 17.01.25]
[28] Carmarthenshire Council (2023) Invasive Weeds. Available at: https://www.carmarthenshire.gov.wales/home/council-services/environmental-health/invasive-weeds/ [Accessed: 17.01.25]
[29] Natural Resources Wales (no date) Carmarthen Bay and Gower Management Catchment Summary. Available at: https://naturalresources.wales/media/681008/2016-updated-carmarthen_bay_catchment_summary_nrw.pdf [Accessed: 16.01.25]

predicted to continue and even increase into the future[30]. The LFRMS provides an opportunity to address these challenges by integrating ecological considerations into flood risk management. Through measures such as river restoration and the removal or re-design of artificial barriers, the LFRMS can help improve ecological resilience while also managing flood risk. Natural Resources Wales (NRW) is seeking to work in partnership with the environmental sector, land owners, and communities in Wales to deliver an action plan designed to improve current approaches to monitoring the health of protected sites in the future, highlighting a key opportunity to accurately improve Carmarthenshire's nationally protected sites[22].

- There are opportunities for the condition of biodiversity assets to be improved and opportunities should be sought to deliver biodiversity enhancements where possible, for example by targeting the issues that are driving decline and supporting recovery.
- There are many high flood risk receptors within Carmarthenshire and its designated sites. With 8942 SSSI, 8114 SAC, and 2009 SPA high risk flood receptors, flooding is a key pressure for Carmarthenshire's biodiversity. There is an opportunity for the LFRMS to mitigate this pressure on biodiversity through the management of these protected sites and their flood risk receptors.
- There is a key opportunity to manage flooding in the LFRMS through the utilisation of nature-based solutions and sustainable land management strategies, both of which share principles of ecosystem stewardship, resilience building, and sustainability. Within these strategies, methods including Green and Blue infrastructure, peatland restoration, and soil and land management can contribute to enhanced ecological connectivity and resilience while improving flood management within Carmarthenshire[31].
- Under 'The Carmarthenshire Nature Partnership', a local organisation with the mission to identify priority areas for action to build ecosystem resilience[4], a Carmarthenshire Local Nature Recovery Plan (LNRP) (2020-2030) is being developed and undertaken. Not only focusing on designated sites, the LNRP seeks to improve the biodiversity of Carmarthenshire through six key objectives dedicated to restoring degraded habitats, improving the resilience of the wider natural environment, and improving county wide evidence and understanding. This is in efforts to help deliver the commitments of the UN Convention on Biological Diversity and the EU Biodiversity Strategy to halt the decline of the local biodiversity, then reverse that decline[32].
- The Carmarthenshire LNRP emphasises the importance of looking beyond the county's internationally and nationally designated sites to focus on the wider natural environment. This approach presents an opportunity to adopt a holistic strategy for enhancing biodiversity. By embedding biodiversity considerations into the LFRMS, addressing key pressures on species and habitats, and implementing a robust framework of governance and support, the plan provides a clear pathway for delivering meaningful and sustainable action[33].
- A key opportunity for the enhancement of biodiversity in Carmarthenshire can be seen in the 'Greening Carmarthenshire' project. With the aim to enhance the green and blue infrastructure (GBI) network found throughout both the urban and rural landscapes of the county, this project seeks to promote the use of Nature based solutions to not only promote the conservation of biodiversity but also make the county a healthier place to live, work, and play[34].

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[30] Gov.uk (2021) Physical modifications: Challenges for the water environment. Available at: https://www.gov.uk/government/publications/physical-modifications-challenges-for-the-water-environment [Accessed: 16.01.25]
[31] Carmarthenshire County Council (no date) Natural Flood Management Scheme. Available at: https://www.carmarthenshire.gov.wales/home/council-services/emergencies-and-community-safety/flooding/flood-defence-schemes/natural-flood-management-nfm-scheme/ [Accessed: 16.01.25]
[32] Carmarthenshire County Council – Carmarthenshire Nature Partnership (2024). Available at: https://www.carmarthenshire.gov.wales/council-services/planning/biodiversity/carmarthenshire-nature-partnership/ [Accessed: 17/01/25]
[33] The Nature Partnership (2020) Nature in Carmarthenshire. Available at: https://www.carmarthenshire.gov.wales/media/1222448/carms-nature-recovery-plan-pt-3.pdf [Accessed: 17.01.25]
[34] Carmarthenshire County Council (no date) Greening Carmarthenshire. Available at: https://www.carmarthenshire.gov.wales/home/business/uk-shared-prosperity-fund-strategicstandalone-projects/greening-carmarthenshire/ [Accessed: 16.01.25]

- The ‘Green and Blue Infrastructure Assessment’ within the Revised 2018-2030 Local Development Plan for Carmarthenshire highlights the importance of incorporating multifunctional GBI into development proposals across the county. The assessment calls for public bodies to prioritise planning for GBI that not only supports the creation of RENs but also delivers tangible benefits for people by improving biodiversity and ecosystem services[35]. The LFRMS presents a key opportunity to align with these principles by integrating GBI into flood management strategies. Features such as wetlands, sustainable drainage systems (SuDS), and natural floodplains can reduce flood risk while simultaneously enhancing biodiversity, improving water quality, and building ecological resilience.

- A Forest Resource Plan (FRP) is a key management document for the Welsh Government’s Woodland Estate (WGWE). These plans outline proposals for the future management of woodlands, aligning with current policies and practices. To meet the standards established by the UK Forestry Standard (UKFS) and the UK Woodland Assurance Standard (UKWAS) for water management and flood risk, future iterations of FRPs will be developed. These updated plans present an opportunity to enhance the resilience of ecosystems in Carmarthenshire while designing and managing forests to contribute to flood risk reduction[36].

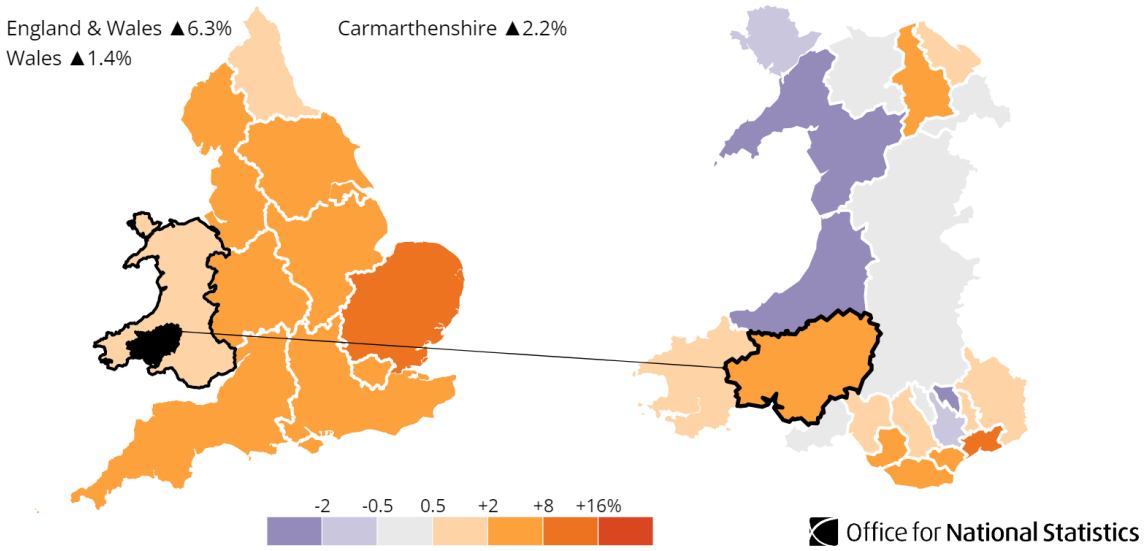
[35] Gov.Wales (2023) Green and Blue Infrastructure Assessment – Technical Report. Available at: green-and-blue-infrastructure-assessment-2023.pdf [Accessed: 20.01.25]
[36] Gov.uk (2022) UK Forestry Standard – Practice Guide. Available at: https://cdn.forestresearch.gov.uk/2022/10/UKFSPG027.pdf [Accessed: 20.01.25]

2 Population

2.1 Baseline Conditions

2.1.1 The most recent population census for Carmarthenshire took place in 2021, setting the county wide population at 187,900, however, mid-2022 population figures published by the ONS state that the latest figure is 189,117[37]. A total of 49 communities which contribute to the county-wide population have been identified to be at a high risk of surface water and ordinary watercourse flooding[107], and 8,617 properties are recognised as undefended and at risk of flooding. This number is expected to rise to 11,386 in the next century[38]. Between 2011 and 2021, the population of Carmarthenshire increased by 2.2%, a greater percentage than the overall population of Wales (1.4%)[39]. Furthermore, population growth in Carmarthenshire was higher than most surrounding areas in South West Wales, shown in Figure B-2 below, and has the fourth highest population in comparison to all local authorities in Wales, shown in Table B-1.

Figure B-2: Population Change in Carmarthenshire: Census 2011 – 2021



Source: ONS (2023)

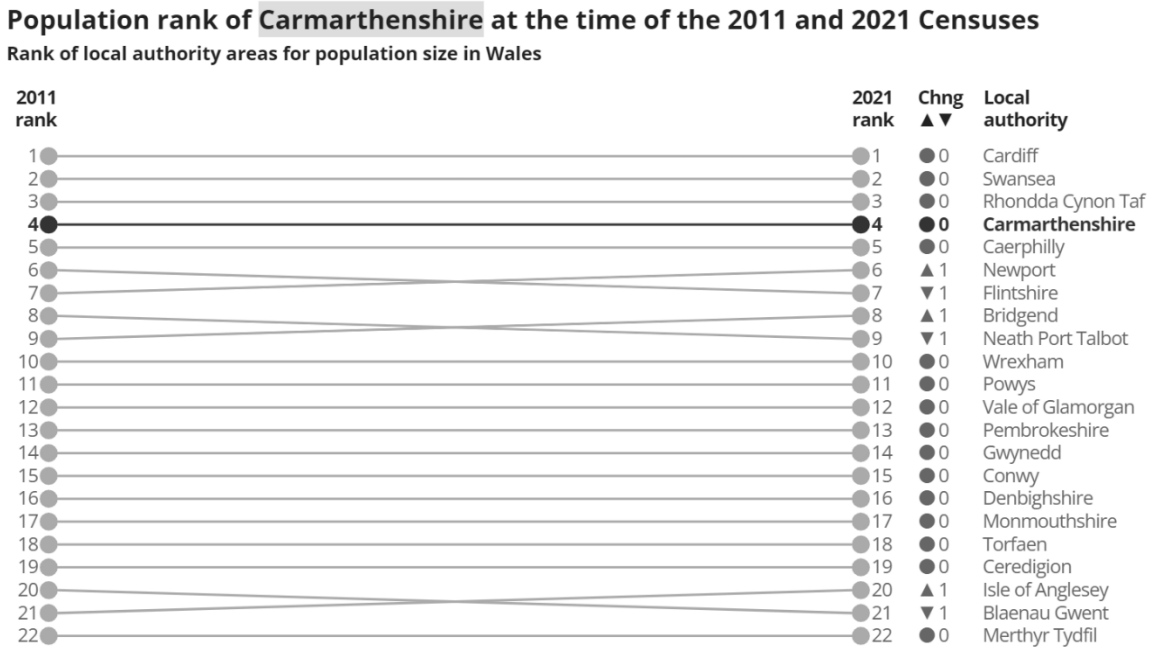
[37] Varbes (2024) Carmarthenshire demographics. Available at: https://www.varbes.com/demographics/carmarthenshire-demographics [Accessed: 27.11.24]
[38] National Infrastructure Commission Wales (2024) Building resilience to flooding in Wales by 2050. Available at: https://www.gov.wales/building-resilience-flooding-wales-2050 [Accessed: 20.01.25]
[39] ONS (2023) How life has changed in Carmarthenshire: Census 2021. Available at: https://www.ons.gov.uk/visualisations/censusareachanges/W06000010/ [Accessed: 27.11.24]

Table B-1: Population change between 2011 and 2021 by local authorities in South West Wales

Local Authority	Population in 2011 Census	Population in 2021 Census	Percentage Change
Pembrokeshire	122,439	123,400	+0.8
Carmarthenshire	183,777	187,900	+2.2
Swansea	239,023	238,500	-0.2
Neath Port Talbot	139,812	142,300	+1.8

2.1.2 Being the third largest county in Wales with an area of around 2,371sq.km, Carmarthenshire had a low population density of 75.7 people per square kilometre in the revised Carmarthenshire Local Development Plan 2018-2033[40], and as of 2021 is the fifth least densely populated out of all formal administrative units of Wales[39]. However, in both the 2011 and 2021 population consensuses, Carmarthenshire ranked fourth for its total population out of all formal administrative units in Wales, shown in Figure B-3 below.

Figure B-3: Population rank of Carmarthenshire from the 2011 to 2021 population consensuses

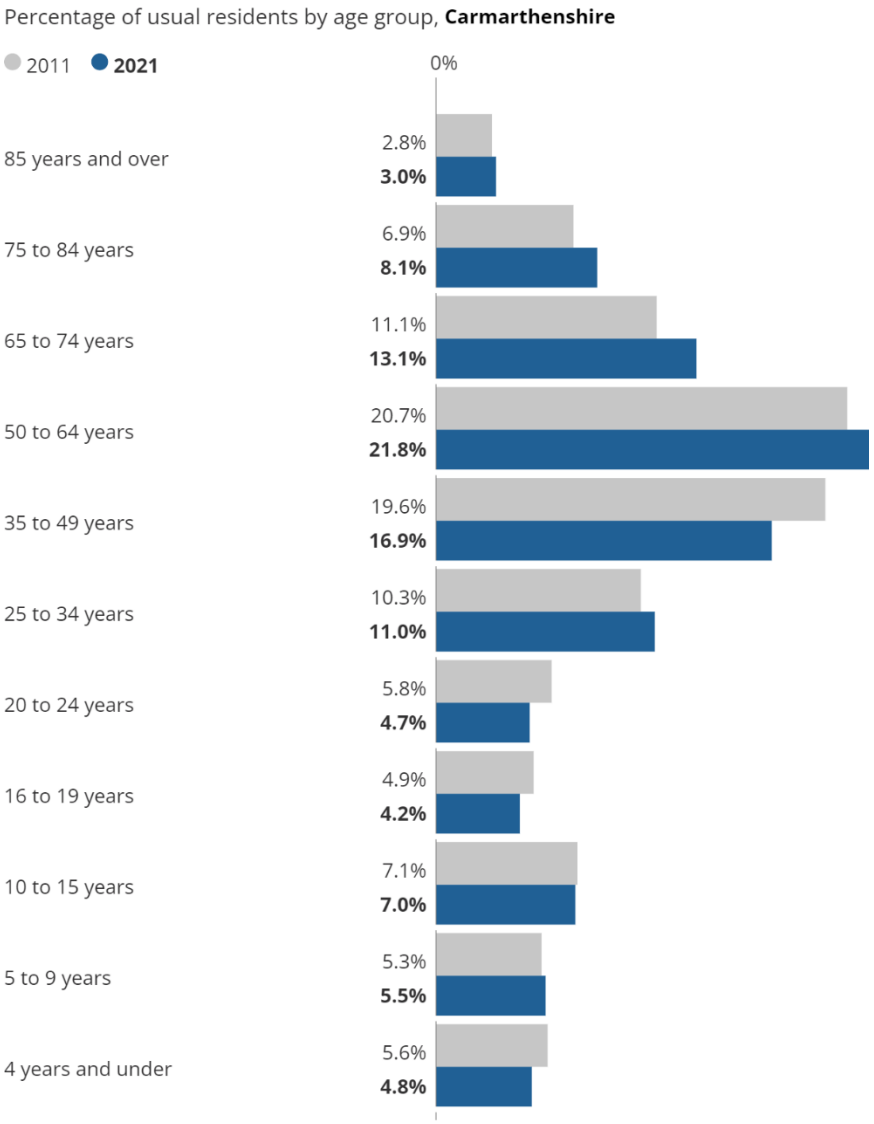


2.1.3 The 2014-based population projections of Carmarthenshire predicted a steady rise of 4,004 persons to 2039, notably lower than that of previous population projections. The 2011-based projection predicted a population growth of 11,946[41]. It is estimated that natural change has had a negative impact on the population growth of Carmarthenshire, which is driven by an aging population profile and lower assumptions on fertility[41].

[40] Carmarthenshire County Council (2024)– Revised Carmarthenshire Local Development Plan 2018-2033. Available at: https://www.carmarthenshire.gov.wales/media/1216121/ldp-summary-introduction-english-final.pdf [Accessed: 27.11.24]
[41] Carmarthenshire County Council (2018) Population & Household Projections 2014-2039. Available at: https://www.carmarthenshire.gov.wales/media/1216736/population-and-household-projections-topic-paper-for-web-version-002.pdf

2.1.4 Between the last two censuses, the median age of Carmarthenshire increased by two years, from 44 to 46 years of age. The county had a slightly lower median age than the nearby Ceredigion (47 years) and a higher median age than Wales as a whole (42 years). Moreover, the number of people aged 65 to 74 years rose by just under 4,300 (an increase of 21%), while the number of residents between 35 and 49 years fell by around 4,200 (a 11.7% decrease)[42], shown in Figure B-4 below. The combined male and female average life expectancy of someone born in Carmarthenshire is 80 years, this has risen by three years over the past decade[37].

Figure B-4: Percentage of Carmarthenshire population by age group (2011-2021 Consensuses)



Source: Office for National Statistics – 2011 Census and Census 2021

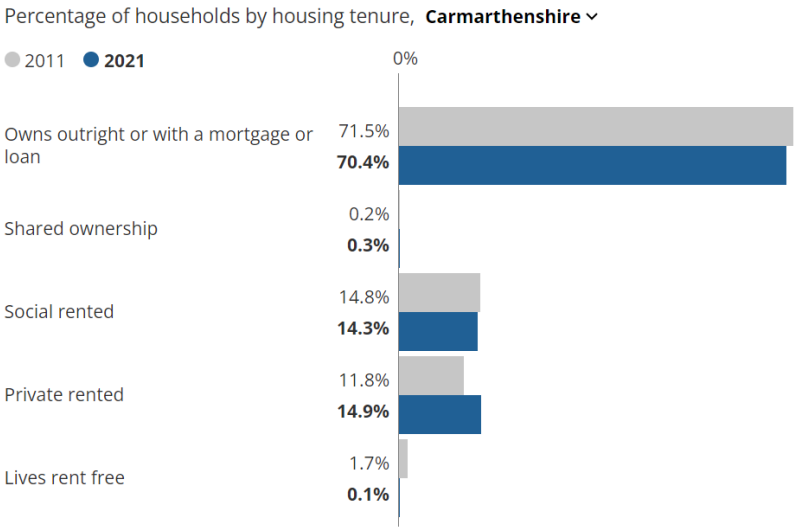
2.1.5 Carmarthenshire's population is predominantly female (51.2%), with the gender demographic of Wales being of a similar percentage (51.1% female and 48.9% male). The ethnic population of Carmarthenshire is predominantly white (97.2%), with non-white minorities representing the remaining 2.8% of the population[37]. The percentage of Welsh speakers in Carmarthenshire has fallen from 43.9% in 2011 to 39.9% in 2021, which was the largest decline in the percentage of Welsh speakers

[42] ONS (2023) Visualisations. Available at: https://www.ons.gov.uk/visualisations/censusareachanges/W06000010/ [Accessed: 27.11.24]

of any local authority area in the country. Of the few areas where knowledge of Welsh language increased, Cardiff saw the largest change from 11.1% to 12.2%[42].

2.1.6 The majority of households by housing tenure in Carmarthenshire consist of homes owned outright or with a mortgage or loan (71.5% in the 2011 consensus and slightly dropping to 70.4% in the 2021 consensus). The increase of privately-rented homes was greater in Carmarthenshire (3.1 percentage points) than nearby Ceredigion (0.7 percentage points), and in Carmarthenshire, the percentage of private renting increased from 11.8% in 2011 to 14.9% in 2021. During the same period, the percentage in nearby Ceredigion increased from 19.9% to 20.6%. The percentage of households by housing tenure is illustrated in Figure B-5 below[42].

Figure B-5: Percentage of Carmarthenshire households by housing tenure (2011-2021 Consensuses)



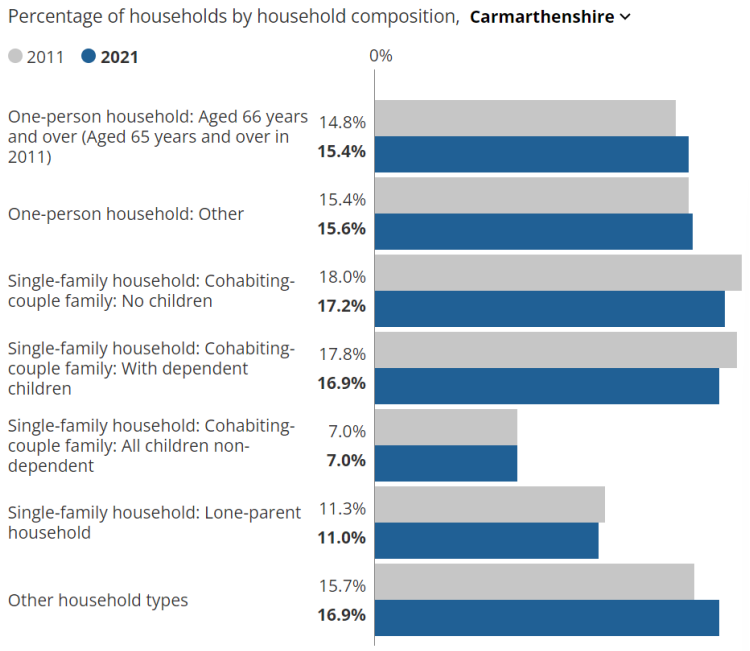
Source: ONS (2023)

2.1.7 Overall, there are around 73,100 households in Carmarthenshire, of these, 72.4% are owner occupied[43]. Properties at most risk of flooding include those within densely populated residential areas such as Bridge Street in the south of Carmarthen and Hillfield Villas, Kidwelly, which are among the areas at most risk of coastal and river flooding. The extensive car parks, paved, and heavily built-up areas across the county also increase the risk of surface water flooding[44]. In 2021, the highest percentage of household-by-household composition were single-family households with a co-habiting couple family and no children at 17.2%, furthermore, 11% of Carmarthenshire households included a lone parent, decreasing from 11.3% in 2011. Consequently, Carmarthenshire was ranked 16th highest out of the 22 Welsh formal administrative units for the percentage of lone-parent households, decreasing from the 10th highest in 2011, the second largest fall (alongside Pembrokeshire) in this category. See Figure B-6 below for the percentage of households by composition in Carmarthenshire.

[43] Senedd Cymru (2008) Key Statistics for Carmarthenshire. Available at: https://senedd.wales/media/xkgngc4s/carmarthenshire-english.pdf [Accessed: 27.11.24]

[44] Carmarthenshire County Council (2023) Available at: https://lucmaps.co.uk/CarmarthenshireDigitalReport/vision-and-objectives/ [Accessed: 20.01.25]

Figure B-6: Percentage of Carmarthenshire households by composition (2011-2021 Consensuses)



Source: ONS (2023)[42]

2.1.8 The predominant mode of transport for those in employment living in Carmarthenshire travel to work by car (62%), though this has reduced by 4.1% since the 2011 consensus. This continues to be far higher than in Wales (56.4%) and England & Wales (45.1%), as shown in Table B-2, which is most likely due to the rurality of the county[45].

Table B-2: 2021 Census Data for Carmarthenshire – Percentage of Method of Travel to Work

All usual residents aged 16 to 74 in employment	Carmarthenshire 2021	Wales 2021	England & Wales 2021
Work mainly at or from home	23.5%	25.6%	31.2%
Underground, metro, light rail or tram	0.0%	0.0%	1.8%
Train	0.4%	0.8%	1.9%
Bus, minibus, or coach	1.1%	2.3%	4.2%
Taxi	0.4%	0.6%	0.7%
Motorcycle, scooter, or moped	0.3%	0.3%	0.5%
Driving a car or van	62%	56.5%	45.1%
Passenger in a car or van	4.6%	4.8%	3.9%
Bicycle	0.6%	1.1%	2.0%

[45] Carmarthenshire County Council (2022) 2021 Census Data for Carmarthenshire – Method of Travel to Work. Available at: https://www.carmarthenshire.gov.wales/media/1230516/method-of-travel-to-work.pdf [Accessed: 27.11.24]

All usual residents aged 16 to 74 in employment	Carmarthenshire 2021	Wales 2021	England & Wales 2021
On foot	6.3%	7.1%	7.6%
Other method of travel to work	0.9%	0.9%	1.0%

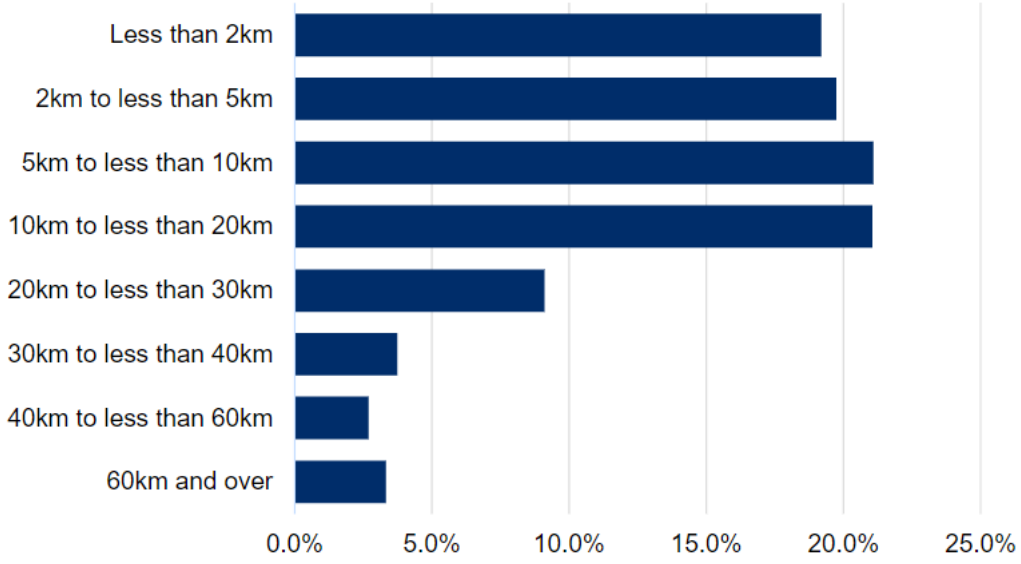
2.1.9 During 2021, the percentage of people aged 16 years and over in employment worked mainly at or from home in Carmarthenshire 23.5%. In England and Wales, of those travelling to a workplace or depot, 9.8 million people (35.4% of usual residents aged 16 years and over in employment) travelled short distances to work (less than 10 kilometres). Looking in more detail within this group:

- 3.1 million people travelled less than 2 kilometres (11.0% of usual residents aged 16 years and over in employment)
- 3.5 million people travelled at least 2 kilometres to less than 5 kilometres (12.6%)
- 3.3 million people travelled at least 5 kilometres to less than 10 kilometres (11.8%)[46]

2.1.10 In 2018, as a whole, the net change in workers across the region was -5,700, indicating that more people commute out of the region than into the region[47].

2.1.10.1 Of residents in Wales that were over 16 and in employment and stated that their main place of work was a workplace or depot, the most common distance travelled was between 5 and 10 kilometres, accounting for 21.1% of those who travel to work (see Figure B-7)[48].

Figure B-7: Distance travelled to work by usual residents ages 16 and over in Wales, 2021



Source: 2021 Census

[46] Office for National Statistics (2022) Travel to work, England and Wales: Census 2021. Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/traveltoworkenglandandwales/census2021 [Accessed: 02.12.24]
[47] Welsh Government (2020) Summary statistics for South West Wales region. Available at: https://www.gov.wales/sites/default/files/statistics-and-research/2020-05/summary-statistics-south-west-wales-region-2020-958.pdf [Accessed: 02.12.24]
[48] Welsh Government (2022) Labour market and travel to work in Wales (Census 2021). Available at: https://www.gov.wales/labour-market-and-travel-work-wales-census-2021-html [Accessed: 02.12.24]

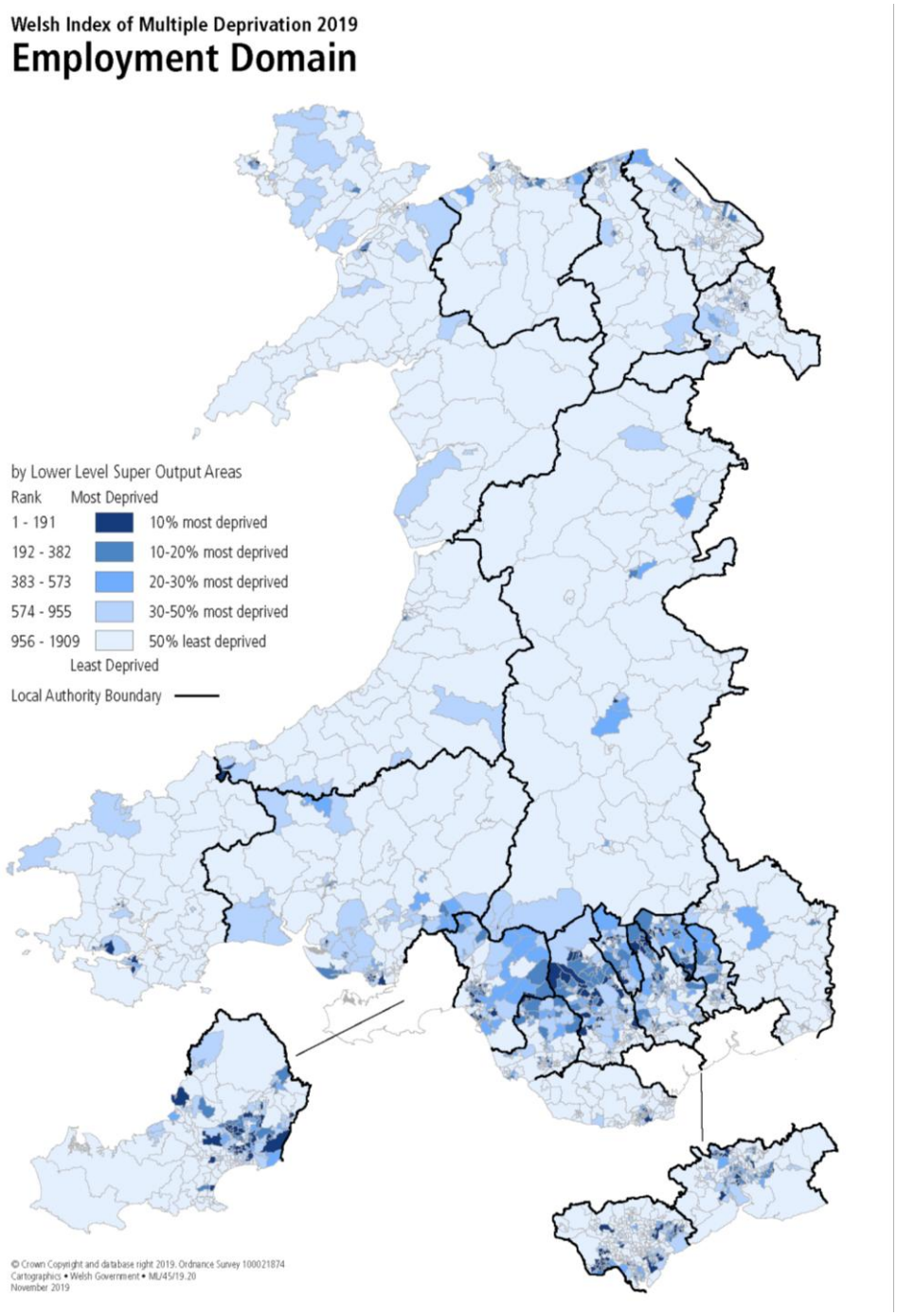
2.1.11 During 2022-23, 77% of 16- to 24-year-olds travel to the same workplace every day compared with 59% of 45- to 64-year-olds. 16- to 24-year-olds are less likely to work remotely than older age groups, 16% compared with 37% for people aged 25 to 44. 34% of people in work say they work remotely for some or all of their working hours. Of those who do not usually work remotely, 21% say that it would be possible to do their job remotely[49].

2.1.12 The 2010, the Welsh Government publication, Economic Renewal: a new direction[50], identified two important factors responsible for Wales weaker economic position compared to the rest of the UK. These are a low employment rate and low average wages (reflecting low average productivity). In November 2021, the employment rate in Wales was 73.8% compared to 75.4% in the UK[51]. As of September 2024, the employment rate in Wales was 70.0%, compared to 74.8% in the UK[52]. This is a decrease from November 2021 for both Wales and the UK.

2.1.13 According to the Welsh Index of Multiple Deprivation (WIMD)[53] 2019 employment domain[54] (see Figure B-8), the highest levels of employment deprivation were in the South Wales valleys and in some North Wales coastal towns. The employment rate for people aged 16 to 64 in Wales was 74.1% in the year ending December 2023, up 0.7 on the previous year. The employment rate in Mid and South West Wales was 73.3% which was unchanged over the year[55].

[49] Welsh Government (2023) National Survey for Wales headline results: April 2022 to March 2023. Available at: https://www.gov.wales/national-survey-wales-headline-results-april-2022-march-2023-html#126289 [Accessed: 02.12.24]
[50] Welsh Government (2010) Economic Renewal: a new direction. Available at: https://www.bridgend.gov.uk/media/2061/sd121.pdf [Accessed: 02.12.24]
[51] Welsh Government (2021) Labour market overview: November 2021. Available at: https://gov.wales/labour-market-overview-november-2021 [Accessed: 02.12.24]
[52] Welsh Government (2024) Labour Market Overview: November 2024. Available at: https://www.gov.wales/sites/default/files/statistics-and-research/2024-11/labour-market-overview-november-2024-054.pdf [Accessed: 02.12.24]
[53] The WIMD ranks each of the 1909 Lower Super Output Areas (LSOAs) in Wales in terms of the level of deprivation that LSOA exhibits for a given domain. Those ranked in the bottom 191 LSOAs are, therefore, in the 10% most deprived nationally.
[54] Welsh Government (2019) Welsh Index of Multiple Deprivation (WIMD) 2019 Results report. Available at: https://www.gov.wales/sites/default/files/statistics-and-research/2020-06/welsh-index-multiple-deprivation-2019-results-report.pdf [Accessed: 02.12.24]
[55] Welsh Government (2024) Labour market statistics (Annual Population Survey): 2023. Available at: https://www.gov.wales/sites/default/files/pdf-versions/2024/6/3/1719407202/labour-market-statistics-annual-population-survey-2023.pdf [Accessed: 02.12.24]

Figure B-8: WIMD 2019 Map for Wales, Employment Domain



Source: WIMD 2019

2.1.14 Workplace employment data shows that in 2018, approximately 311,400 people worked in South West Wales. The average level of employment across the region's four local authorities was approximately 77,900 persons, while this is the highest level among the four regions, it is positively skewed because of the high proportion of employment in Swansea[56].

[56] Welsh Government (2020) Summary statistics for South West Wales region. Available at: https://www.gov.wales/sites/default/files/statistics-and-research/2020-05/summary-statistics-south-west-wales-region-2020-958.pdf [Accessed: 02.12.24]

2.1.15 The percentage of people in employment is one of the national wellbeing indicators. A national milestone has been set for this national indicator which is to eradicate the gap between the employment rate in Wales and the UK by 2050, with a focus on fair work and raising labour market participation of under-represented groups. The employment rate in Wales has gradually increased since 2011 and the gap between the employment rate in Wales and the UK has gradually closed to 1.7 percentage points in the year ending December 2023, a decrease of 0.5 percentage points compared to the gap a year before[57].

2.1.16 The economic inactivity rate in Mid and South West Wales in the year end December 2023 was 20.4%, a decrease of 0.2 percentage points over the year[58]. Economic inactivity in Carmarthenshire in 2024 was 23.2%, which has decreased from the previous year[59].

2.2 Data Gaps

- Information regarding to businesses at risk of flooding.

2.3 Key Issues and Opportunities

- The expected continuation of the aging population in Carmarthenshire could place increased pressure on healthcare, social services, and retirement-related infrastructure, while reducing the workforce population.
- The decline of Welsh speakers poses risks for cultural preservation, efforts to revitalise this language presents itself as a key opportunity.
- The high reliance on private cars could result in elevated carbon emissions and thus environmental concerns, prompting the opportunity to ensure the maintenance of access to public transport and its infrastructure.
- The LFRMS should seek to protect the local economy by maximising the resilience of services, sustainable transport infrastructure and accessibility networks.
- A key opportunity to reduce the flood risk of high risk areas such as densely populated residential areas is presented in the 'Green and Blue Infrastructure Assessment' within the Revised 2018-2030 Local Development Plan for Carmarthenshire. This emphasises the importance of maximising opportunities to integrate multifunctional GBI within development proposals throughout the county[35], enhancing flood and water management within residential, built environments. The use of SuDS is also an opportunity to mitigate the risk to key urban flood receptors.
- Ammanford's flood risk management scheme has reduced flood risk to key transport routes, Ammanford railway station, and 235 properties, highlighting key opportunities for the LFRMS to improve flood management in Carmarthenshire[60].
- With the number of properties at high risk of flooding in Carmarthenshire and coastal erosion projected to increase, addressing climate change is critical to the county's future flood risk

[57] Welsh Government (2024) Labour market statistics (Annual Population Survey): April 2023 to March 2024. Available at: https://www.gov.wales/labour-market-statistics-annual-population-survey-april-2023-march-2024-html [Accessed: 02.12.24]
[58] Welsh Government (2024) Labour market statistics (Annual Population Survey): 2023. Available at: https://www.gov.wales/labour-market-statistics-annual-population-survey-2023-html#:~:text=The%20economic%20inactivity%20rate%20in,differences%20calculated%20using%20unrounded%20figures [Accessed: 02.12.24]
[59] ONS (2024) Employment, unemployment and economic inactivity in Carmarthenshire. Available at: https://www.ons.gov.uk/visualisations/labourmarketlocal/W06000010/ [Accessed: 02.12.24]
[60] NRW (2024) Ammanford's £6m Flood Risk Management Scheme officially opened. Available at: https://cyfoethnaturiolcymru.gov.uk/about-us/news-and-blogs/news/ammanford-s-6m-flood-risk-management-scheme-officially-opened/?lang=en [Accessed: 20.01.25]

management. Combined with population growth and the rising demand for residential infrastructure, there is an opportunity for the LFRMS to integrate flood resilience into new housing developments while adapting existing infrastructure. This could facilitate the enhanced management of increased water levels and flooding events.

3 Human Health

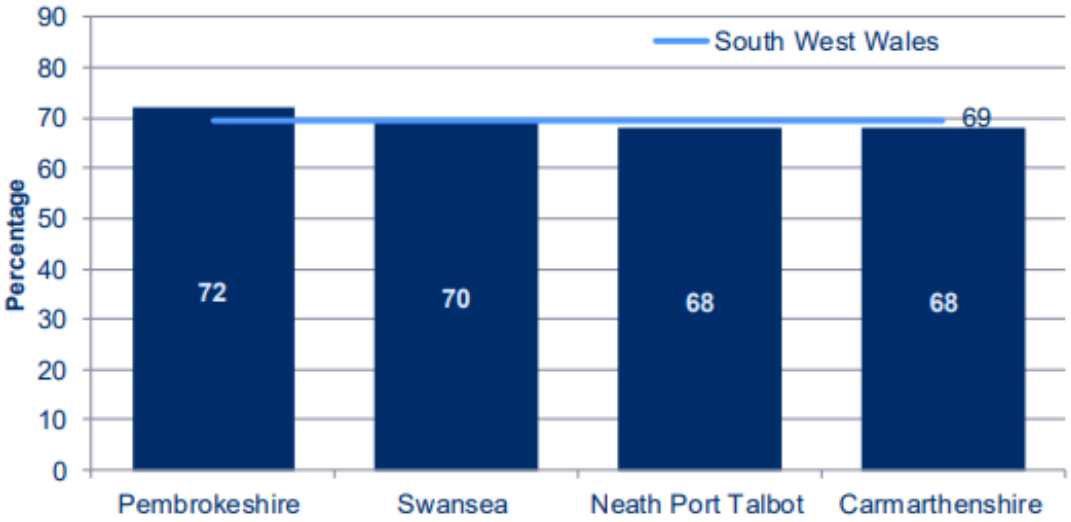
3.1 Baseline Conditions

3.1.1 NHS Wales delivers services through 7 local health boards and 3 NHS trusts. They are responsible for planning and delivering NHS services (dental, optical, pharmacy, mental health) in their respective areas. Hywel Dda University Health Board is responsible for NHS services in Carmarthenshire[61], and there are 11 GP practices and clinical services across the county[62]. As of the 28th November 2024, this health board has begun to refresh its strategy for a healthier mid and west Wales, and has considered further changes needed to provide safe, quality, and sustainable care across primary and community settings[63]. Within NHS Wales, Public Health Wales (The public health agency for the region) has developed a Health Impact Assessment (HIA), which is a strategic and comprehensive appraisal of the potential implications of climate change on population health in Wales. It provides robust evidence to inform public bodies, agencies, and organisations in their preparations for, and responses to climate change and climate change events[64]

3.1.2 In Carmarthenshire, life expectancy was higher for females (81.8 years) than for males (78.4) in 2020[65]. This has increased from 80.2 and 75.4 in 2010[66], though is slightly lower than the life expectancy in England (82.7 years for males and 78.7 for females)[67]. Furthermore, from 2017 – 2019 in South West Wales, Carmarthenshire ranked last in adults who reported they were in good or very good general health, as shown in Figure B-9[68].

[61] Welsh Government (2023) NHS Wales health boards and trusts. Available at: https://www.gov.wales/nhs-wales-health-boards-and-trusts [Accessed: 28.11.24]
[62] Find my doctor (2024) Find a GP in Carmarthenshire. Available at: https://www.find-my-doctor.co.uk/carmarthenshire#:~:text=How%20many%20GP%20practices%20are%20there%20in%20Carmarthenshire%3F,the%20contact%20details%20of%20a%20doctor%20in%20Carmarthenshire. [Accessed: 28.11.24]
[63] Bwrdd Iecgyd Prifysgol Hywel Dda University Health Board (2024) Health Board will refresh strategy for a healthier mid and west Wales. Available at: https://hduhb.nhs.wales/news/press-releases/health-board-will-refresh-strategy-for-a-healthier-mid-and-west-wales/ [Accessed: 28.11.24]
[64] Public Health Wales (2023) Climate Change in Wales: Health Impact Assessment. Available at: https://phwwhocc.co.uk/wp-content/uploads/2023/07/PHW-Climate-Change-HIA-Summary-Report-English-Final-10_2023-002.pdf [Accessed: 22.01.25]
[65] Carmarthenshire County Council (2024) Health of Carmarthenshire Residents. Available at: https://www.carmarthenshire.gov.wales/media/mtyfntri/health-of-carmarthenshire-residents.pdf [Accessed: 28.11.24]
[66] Varbes (2024) Demographics of Carmarthenshire. Available at: https://www.varbes.com/demographics/carmarthenshire-demographics [Accessed: 28.11.24]
[67] UK Health Security Agency (2020) Life expectancy in England 2020. Available at: https://ukhsa.blog.gov.uk/2021/03/31/life-expectancy-in-england-in-2020/ [Accessed: 28.11.24]
[68] Welsh Goverrnment (2020) Summary statistics for South West Wales region. Available at: https://www.gov.wales/sites/default/files/statistics-and-research/2020-05/summary-statistics-south-west-wales-region-2020-958.pdf [Accessed: 28.11.24]

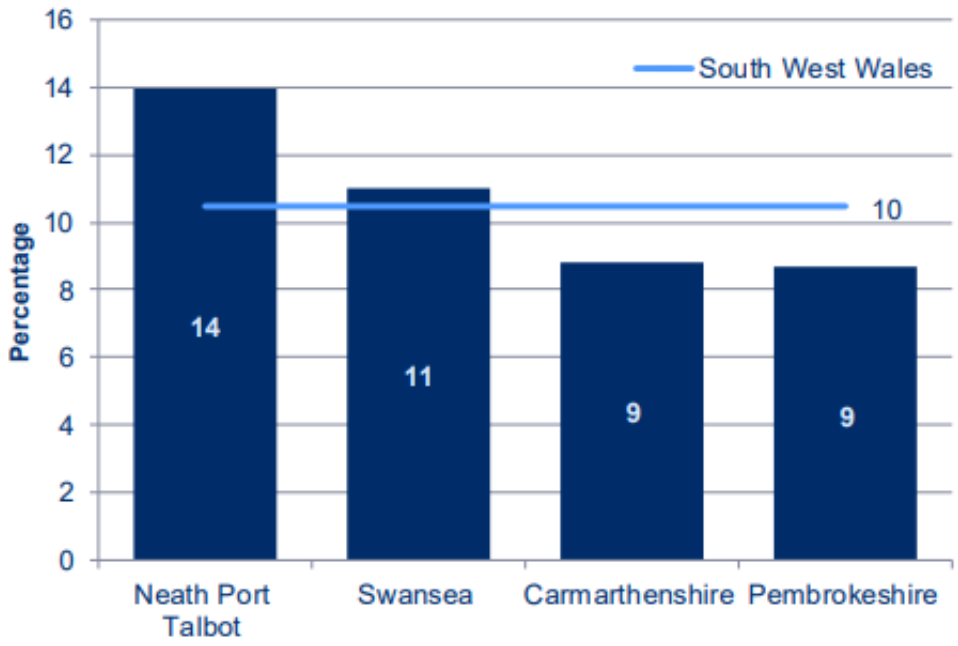
Figure B-9: Percentage of adults aged 16 and over in South West Wales reporting they are in good or very good general health



Source: Welsh Government (2020)

3.1.3 This lower life expectancy may be due to the reduced reports of lower levels of healthy lifestyle behaviours in Carmarthenshire, which include not smoking, average weekly alcohol consumption 14 units or lower, eating at least 5 portions of fruit & veg the previous day, having a healthy body mass index, and being physically active at least 150 minutes the previous week. This is illustrated in Figure B-10 below, where the percentage of Carmarthenshire adults showing 0 to 1 healthy lifestyle behaviours is the lowest in SWW (along with Pembrokeshire)[68].

Figure B-10: Percentage of adults aged 16 and over in South West Wales showing 0 or 1 healthy lifestyle behaviours



Source: Welsh Government (2023)

3.1.4 A total of 54.7% of households in Carmarthenshire are deprived in at least one dimension in 2021, a decrease of 7.3% since the last census (2011)[69]. This is higher than statistics for both Wales and England & Wales, see Table B-3 below.

Table B-3: 2021 Census Data for Carmarthenshire – Percentage of Household Deprivation

Households by Deprivation Dimensions	Carmarthenshire 2021	Wales 2021	England & Wales 2021
Household is not deprived in any dimension	45.3%	45.9%	48.3%
Household is deprived in one dimension	34.1%	33.4%	33.5%
Household is deprived in two dimensions	16.4%	16.0%	14.3%
Household is deprived in three dimensions	4.1%	4.5%	3.7%
Household is deprived in four dimensions	0.1%	0.2%	0.2%

3.1.5 Deprivation is a key driver of flood vulnerability[70]. Across Carmarthenshire, there is variation across the six community areas for its levels of deprivation, where regions within Llanelli appear in the 10% most deprived areas of Wales in the following domains: income, employment, health, education, community safety, and physical environment[71]. Approximately 70% of northern Carmarthenshire (Tywi valley) appears in the most 10% deprived areas of Wales in terms of poor 'Access to Services', and 36.3% of households are living in poverty, slightly above the Welsh average of 35%[71].

3.1.6 In 2022 and 2023, hospital admissions from all causes in areas covered by Hywel Dda University Health Board was reported to be 22,501.9, ranked in the middle of all 7 local health boards in Wales. 40.1% of adults in Carmarthenshire have reported having a long-term illness, which had dropped from 51.2% in 2020[72]. Carmarthenshire has the 3rd lowest number of Covid-19 related deaths per 100,000 people in Wales[73].

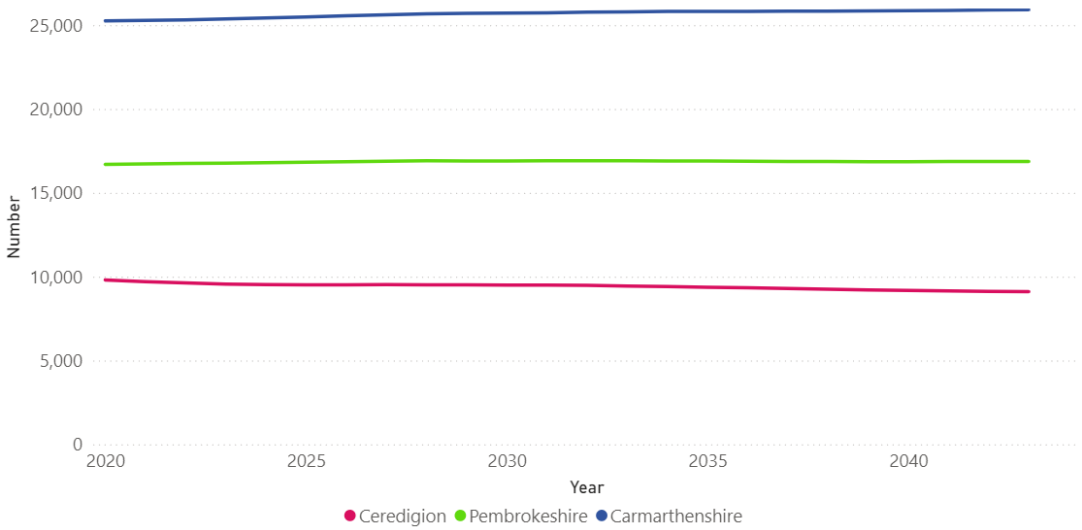
3.1.7 Children who are overweight or obese continues to increase in Carmarthenshire. The county has the 5th highest levels of children that are overweight or obese (30.4%) in comparison to other Welsh local authorities, 3.5% higher than the national average of 26.9%[74]. Conversely, 60.8% of Carmarthenshire residents are reported to exercise enough (physically active for at least 150 minutes in the week)[65], and the county's landscape, countryside, and beaches were experienced by over 3 million people in 2021[71]. Carmarthenshire has also received £2m of internal and external funding to contribute to efforts to improve physical activity in the county by developing a community use leisure centre site[72]. Active travel to work is low at 0.6% of commuters by bike, and 6.3% by foot. Active travel schemes

[69] Carmarthenshire County Council (2022) Census data for Carmarthenshire – Household deprivation. Available at: https://www.carmarthenshire.gov.wales/media/1230274/household-deprivation.pdf [Accessed: 28.11.24]
[70] Sayers & Partners (2017) present and Future Flood Vulnerability: Risk and Disadvantage. Available at: http://www.sayersandpartners.co.uk/uploads/6/2/0/9/6209349/sayers_2017_-_present_and_future_flood_vulnerability_risk_and_disadvantage_-_final_report_-_uploaded_05june2017_printed_-_high_quality.pdf [Accessed: 20.01.25]
[71] The Carmarthenshire We Want (2022) Wellbeing fact sheet. Available at: https://www.thecarmarthenshirewewant.wales/media/8164/wellbeing-fact-sheets.pdf [Accessed: 28.11.24]
[72] Carmarthenshire County Council (2023) Live well – Help people live healthy lives. Available at: well-being-objective-7-2021-2022.pdf [Accessed: 28.11.24]
[73] Carmarthenshire County Council (2020) Impact of COVID-19 on Carmarthenshire. Available at: https://www.carmarthenshire.gov.wales/media/1223924/impact-of-covid-on-carmarthenshire.pdf [Accessed: 29.11.24]
[74] Carmarthenshire County Council (2023). Well-being in Carmarthenshire: What we know. Available at: https://www.carmarthenshire.gov.wales/media/1226250/wellbeing-in-carmarthenshire.pdf [Date accessed: 29.11.24]

have been designed in Carmarthenshire to also help increase physical activity, and Carmarthenshire County council are constantly seeking ways to improve the active travel network, which includes Black Lion Road, Carmarthen, and Llandovery[75].

3.1.8 In Carmarthenshire, there are currently 15,845 women and 9,498 men with common mental health disorders. Current projections indicate a slight increase by 2043, with an expected 16,378 women and 9,544 men. This is higher than both Ceredigion and Pembrokeshire and is expected to remain this way in current projections, see Figure B-11 below.

Figure B-11: Current and projected number of people with a common mental health disorder in Carmarthenshire, Ceredigion, and Pembrokeshire



Source: The Carmarthenshire we Want (2022)

3.1.9 The WIMD 2019[76] sets out deprivation in relation to access to services. The access to services domain measures travel times to a range of services as a proxy for wider physical access to services. For WIMD 2019, the domain also considers access to digital services, through an indicator on the availability of superfast broadband. The domain measures include access to the following services:

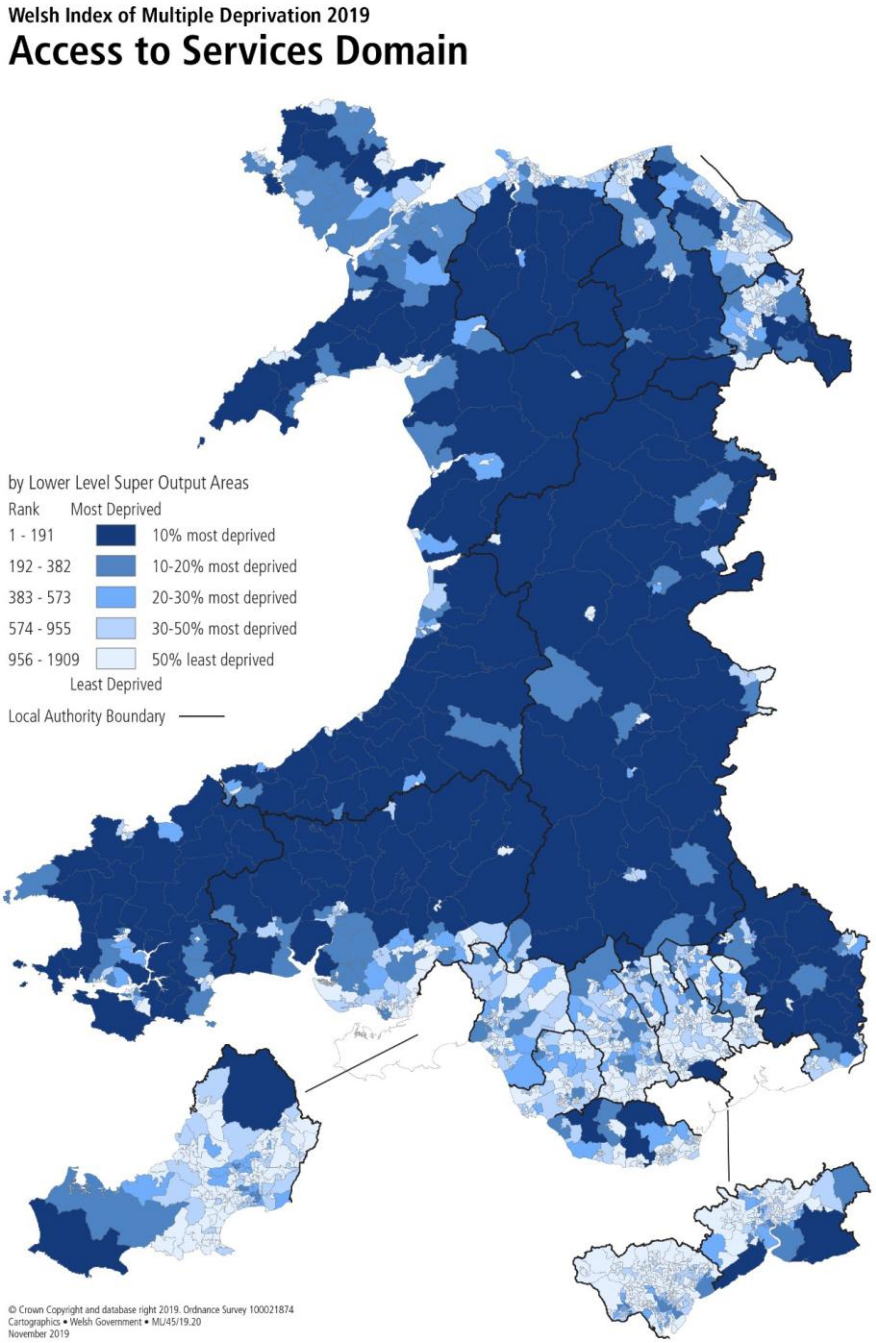
- Food shop
- General Practitioner (GP) Surgery
- Post Office
- % Unavailability of broadband at 30Mb/s
- Primary School
- Public Library
- Sports Facility
- Secondary School
- Petrol Station
- Pharmacy

[75] Carmarthenshire County Council (2023) Access to walking and cycling (Active travel). Available at: https://www.carmarthenshire.gov.wales/home/council-services/highways-travel-parking/access-to-walking-and-cycling-active-travel/ [Accessed: 29.11.24]

[76] Welsh Government (2019) Welsh Index of Multiple Deprivation (WIMD) 2019 Results report. Available at: https://www.gov.wales/sites/default/files/statistics-and-research/2020-06/welsh-index-multiple-deprivation-2019-results-report.pdf [Accessed: 02.12.24]

3.1.10 Figure B-12 presents the overall scores across Wales. In the WIMD 2019 access to services domain, high deprivation was widespread across rural areas of Wales. There were also some deprived pockets near large urban areas. For the access to services domain, the most deprived small area in Wales was Cynwyl Gaeo, Carmarthenshire, the same as for WIMD 2014. Six of the 10 most deprived areas in WIMD 2019 were also in the 10 most deprived areas in WIMD 2014. The overall patterns of access to services deprivation in WIMD 2019 are similar to those for WIMD 2014. However, there have been notable changes to relative ranks at the least deprived end. This reflects the significant improvements in the travel time calculations, as well as possible changes to service locations, public transport and road networks since 2014, and the inclusion of the new access to digital services indicator.

Figure B-12: Access to services for LSOAs in Wales



Source: WIMD 2019

3.1.11 Table B-4 presents, for the WIMD 2019 overall Index, the percentage of small areas (LSOAs) in Carmarthenshire that were in the most deprived 10%, 20%, 30% and 50% areas in Wales[77].

[77] Welsh Government (2019) Welsh Index of Multiple Deprivation (WIMD) 2019 Results report. Available at: https://www.gov.wales/sites/default/files/statistics-and-research/2020-06/welsh-index-multiple-deprivation-2019-results-report.pdf [Accessed 02.12.24]

Table B-4: WIMD overall index in Carmarthenshire

Number of LSOAs in local authority	% LSOAs in most-deprived 10% ranks 1-191	% LSOAs in most-deprived 20% ranks 1-382	% LSOAs in most-deprived 30% ranks 1-573	% LSOAs in most-deprived 50% ranks 1-955
112	4.5	10.7	26.8	54.5

3.2 Data Gaps

- Life expectancy statistics past 2020.
- Limited available statistics beyond the 2021 population census.

3.3 Key Issues and Opportunities

- The limited access to public transport and rurality of the county may present an issue for access to NHS services, particularly due to the aging population. The LFRMS should ensure that accessibility is maintained or improved through flood risk management measures.
- The LFRMS could enhance green open spaces as part of flood risk measures, to promote health and wellbeing.
- The variation of deprivation throughout the county could reflect a combination of key issues surrounding historical, economic, geographic, and social factors that have shaped the development and resources of the county over time, highlighting the opportunity to target and develop key factors of concern within each locality. The deprived localities of Carmarthenshire could also be disproportionately affected by flooding and risk of flooding, and the LFRMS should seek to reduce potential geographical inequalities which may contribute to this flood risk.
- There may be an opportunity for the combination of flood risk management measures and investment in pedestrian footpaths and cycling infrastructure, which can lower emissions, promote healthier lifestyles, and reduce car dependency.
- The ageing population in Carmarthenshire could struggle with some flood risk management measures such as those providing alerts. If systems aren't developed to meet the needs of the older population, instances of isolation and reduced access to essential services may increase.
- The Carmarthenshire Public Services Board (PSB) have produced a Well-being plan to improve the economic, social, environmental, and cultural wellbeing of the county from 2023-2028. Presenting a key opportunity to improve health and resilience within Carmarthenshire, the plan follows objectives including the reduction of health inequalities and responding to climate and nature emergencies, such as flooding events[78].
- The dedication to implementing new GBI throughout Carmarthenshire demonstrated in the revised 'Local Development Plan 2018 – 2033' creates an opportunity for improved nature contact within urban environments. Through enhancing green and blue spaces and their accessibility, the well-being of communities can benefit whilst the area is adapted to more efficient and sustainable flood management[35].
- The British Red Cross research 'Every time it Rains' explores the experiences of communities impacted most severely by flooding, and highlights the areas in need for improvements in policy and practice that ensures people are prepared for, and can recover more quickly from flooding.

[78] Carmarthenshire's Public Services Board (2023) Well-being Plan for 2023 – 2028. Available at: https://www.thecarmarthenshirewewant.wales/ [Accessed: 20.01.25]

This presents a key opportunity to improve the health and wellbeing of Carmarthenshire through improving how the county manages flooding[79].

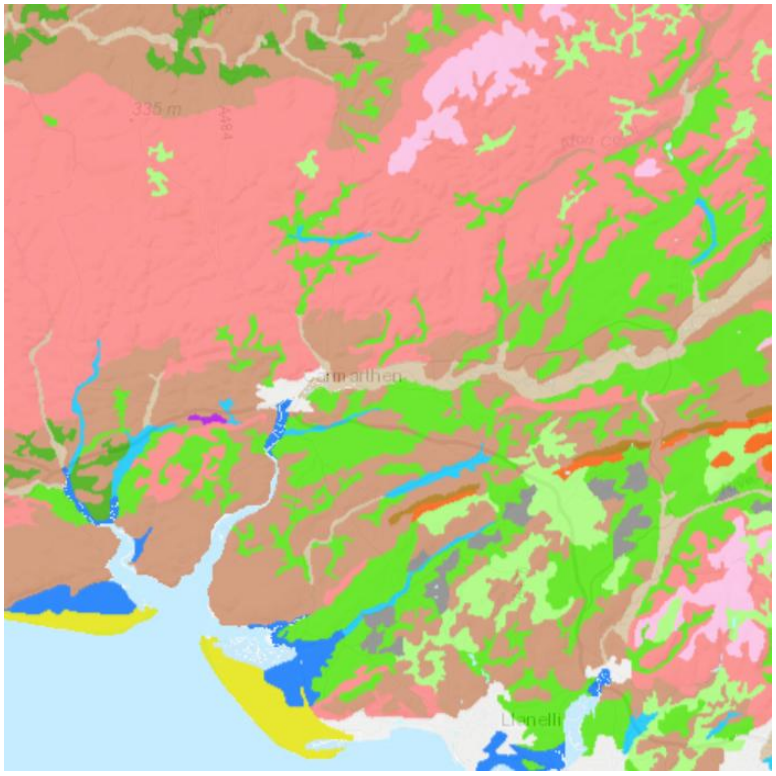
[79] British Red Cross (no date) Available at: https://www.redcross.org.uk/about-us/what-we-do/we-speak-up-for-change/every-time-it-rains-british-red-cross-report-on-flooding [Accessed: 20.01.25]

4 Soil

4.1 Baseline Conditions

4.1.1 Carmarthenshire is comprised of a vast combination of soils which are identified and described in Figure B-13 below. Predominantly consisting of draining acid loamy soils over rock to the north and north-west above Carmarthen, slowly permeable seasonally wet acid loamy and clayey soils around Carmarthen and to the east and north-east, and loamy and clayey soils of coastal flats with naturally high groundwater and sand dune soils to the south around Carmarthen Bay[80], the soil composition of Carmarthenshire reflects the scarcity of high quality agricultural soils found within Wales, which are relatively unusual in a global context, and those considered to be the best and most fertile account for no more than 7% of Wales's land area[81].

Figure B-13: Soil composition of Carmarthenshire

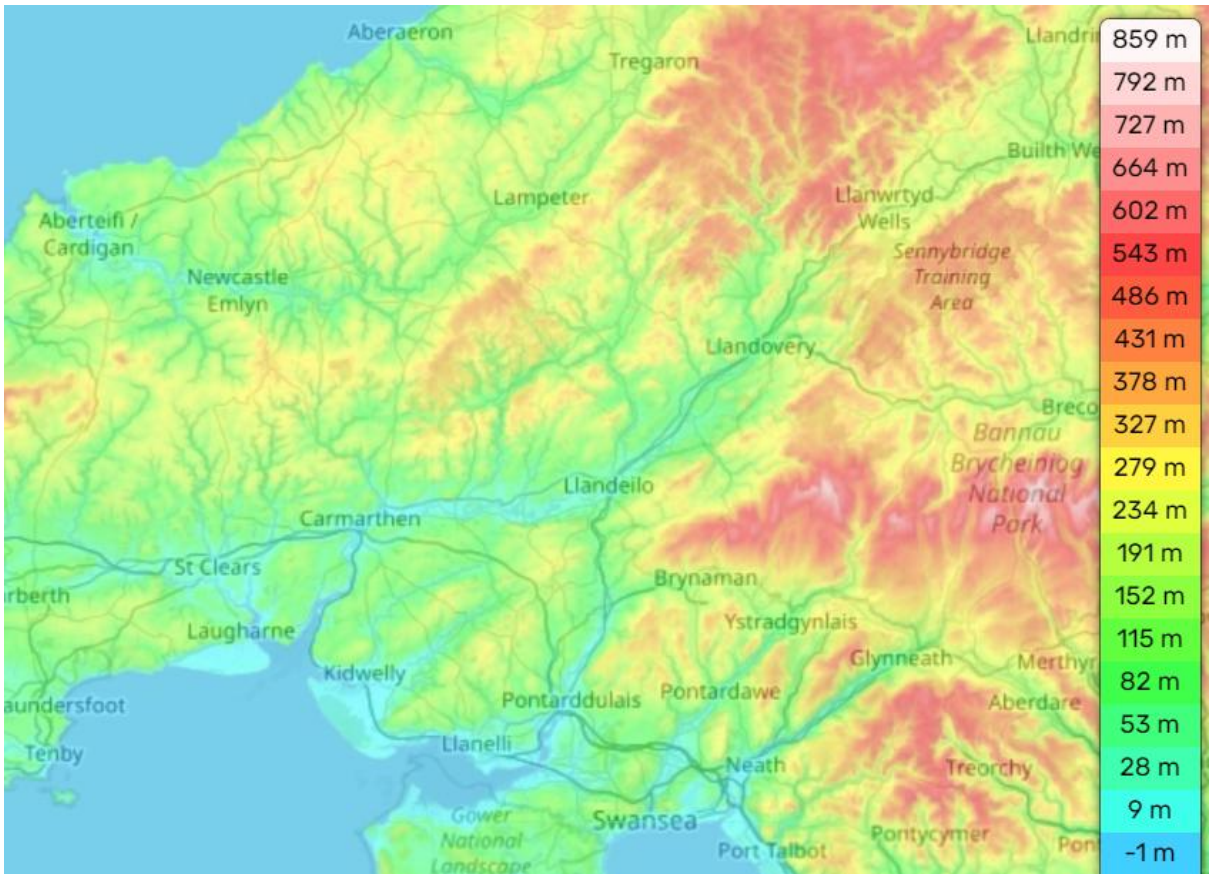


4.1.2 Carmarthen's geology is almost entirely made up of geology comprised of mudstone, siltstone, and sandstone, aside from areas to the south of Llandybie. To the south of the Black Mountains, including the south of Carmarthenshire, north of Swansea, and Neath Port Talbot, the geology incorporates Pennine Lower and Middle Coal Measures Formations, and is predominantly made up of South Wales Upper Coal Measures Formations[82].

[80] UKSO (no date) Soilscapes for England and Wales. Available at: https://mapapps2.bgs.ac.uk/ukso/home.html [Accessed: 29.11.24]
[81] NRW (2020) SoNaRR2020: Land use and Soil. Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/state-of-natural-resources-report-sonarr-for-wales-2020/sonarr2020-our-assessment/cross-cutting-themes/land-use-and-soil/?lang=en [Accessed: 21.01.25]
[82] JBA Consulting (2022) South West Wales – Stage 1 Strategic Flood Consequence Assessment. Available at: 1-hri-jbau-xx-xx-rp-hm-0002-a1-c01-stage_1_sfca.pdf [Accessed: 29.11.24]

4.1.3 With an area of 2,370km²[83], the land in Carmarthenshire is predominantly agricultural (80%) which provides ecosystem services such as flood prevention and carbon storage[23].There are a number of quarries in the county: Black Mountain Quarries, Alltgoch Quarry, Garnwen Quarry, Breedon Gilfach Quarry, Blaencilgoed Quarry, Cware Pantgwyn Quarry among others, and many of which are currently operational. The topography of Carmarthenshire spans from 0-9m above sea level to 859m in some areas at Black Mountain to the east[84], though is predominantly between 53m to 234m above sea level. See Figure B-14 for the topography of Carmarthenshire.

Figure B-14: Topography of Carmarthenshire[85]



Source: Topographic-map.com[85]

4.1.4 Carmarthenshire has 170 coal tips, with one in Category C (has the potential to impact public safety, should be inspected at least once a year)[86]. These are managed by the Mining Remediation Authority[87]. Coal tips have the potential to exacerbate and even cause flooding, with heavy rain in 2020 causing a landslip at a coal tip in Wattstown, leading to flooding in Carmarthenshire and the river Towy to breach its banks[88].

[83] Carmarthenshire County Council (2022) Carmarthenshire County profile. Available at: https://www.carmarthenshire.gov.wales/media/1224912/county-profile.pdf [Accessed: 29.11.24]
[84] Brittannica (no date) Carmarthenshire County. Available at: https://www.britannica.com/place/Wales [Accessed: 29.11.24]
[85] Topographic-map.com (no date) Carmarthenshire topographic map. Available at: https://en-gb.topographic-map.com/map-1tg14/Carmarthenshire/?center=52.20143%2C-5.1418&zoom=12 [Accessed: 29.11.24]
[86] Welsh Government (no date) Coal tip safety. Available at: https://www.gov.wales/coal-tip-safety [Accessed: 20.01.25]
[87] Gov.uk (2024) New Era as Coal Authority becomes the Mining Remediation Authority. Available at: https://www.gov.uk/government/news/new-era-as-coal-authority-becomes-mining-remediation-authority [Accessed: 20.01.25]
[88] BBC (2020) Landslip warning and flooding follow heavy rain in Wales. Available at: https://www.bbc.co.uk/news/uk-wales-55375381 [Accessed: 20.01.25]

- At present, peatland bogs in Carmarthenshire are diminished in area and condition[89] and are present throughout the county, though most notably to the south and southeast[90]. In 2015, a partnership led by Carmarthenshire County Council received a grant of £43,000 from the Heritage Lottery Fund (HLF) to explore some of these bog habitats and focused on five areas of lowland bog on areas of common land near Brechfa and Llanfynydd[89]. The Carmarthenshire Bogs Project is dedicated to revitalising peatland areas throughout Carmarthenshire[92]. The Project focuses on five areas of lowland bog on areas of common land near Brechfa and Llanfynydd. The National Peatland Restoration Programme managed by NRW aids in the regeneration of peatlands in Carmarthenshire, with the aim to restore 3,000 acres of peatland across Wales and seeking to improve water management, carbon storage, and biodiversity across the country, which should benefit Carmarthenshire's ability to adapt to future flood risk[91].

4.2 Data Gaps

- Data relating to soil erosion and loss as a result of flooding in Carmarthenshire.
- Data relating to contaminated land at risk of flooding or coastal erosion.

4.3 Key Issues and Opportunities

- The predominantly acid loamy, clayey, and sandy soils may limit agricultural productivity and require specific land management practices, this should be considered when developing flood risk management measures in the LFRMS.
- Slowly permeable soils around Carmarthen and the east increase the likelihood of surface water runoff and flooding during heavy rainfall. The low-lying areas of land are also susceptible to flooding, posing risks to both agricultural and developed land.
- The high frequency of active quarries may contribute to environmental degradation, biodiversity loss, and localised flooding risks within Carmarthenshire.
- A key opportunity is presented in the promotion of sustainable agricultural practices, such as contouring, to enhance soil stability and runoff. This will aid in reducing flood risk in the LFRMS.
- A key opportunity for the improvement of flood management to mitigate soil erosion and the loss of topsoil is recognised with the use of Sustainable urban drainage systems, such as permeable surfaces.
- Due to their ties to flood risk, the coal tips in Carmarthenshire present a key issue for flood management in the county. Methods to manage these sites to reduce their impact is a key opportunity for the LFRMS.
- Helping to revitalise and maintain peatland areas, the Carmarthenshire Bogs Project offers an opportunity to mitigate climate change, as healthy bogs can store carbon from the atmosphere and are one of the largest known carbon stores[92]. Healthy peatlands can also absorb and hold large quantities of water, reducing surface runoff and offering an opportunity for the LFRMS to mitigate flood risk.
- There is a key opportunity to reduce flood risk and soil erosion in the LFRMS seen in nature-based solutions. These sustainable, less invasive strategies can also provide wider benefits such

[89] Carmarthenshire County Council (2025) Carmarthenshire Bogs Project. Available at: https://www.carmarthenshire.gov.wales/home/council-services/planning/biodiversity/hlf-bogs-project/ [Accessed: 31.01.25]
[90] NRW (no date) Welsh Peatlands Data. Available at: https://smnr-nrw.hub.arcgis.com/apps/d18ef8c74ecc4dc4a0cbf71ab6935ba0/explore [Accessed: 31.01.25]
[91] Welsh Government (2024) Welsh Government Beats Peatland Targets a year early. Available at: https://www.gov.wales/welsh-government-beats-peatland-targets-year-early-saving-more-8000-tonnes-carbon-every-year#:~:text=Set%20up%20by%20the%20Welsh%20Government%20in%202020%2C,the%20equivalent%20of%20more%20than%203%2C000%20rugby%20pitches. [Accessed: 21.01.25]
[92] Carmarthenshire County Council (2025) Carmarthenshire Bogs Project. Available at: https://www.carmarthenshire.gov.wales/home/council-services/planning/biodiversity/hlf-bogs-project/ [Accessed: 21.01.25]

as reducing water pollution and increasing resilience during droughts. Methods such as sustainable and regenerative agricultural land management within catchment areas have a key role in reducing soil surface run-off and erosion associated with degraded soil structure from intensive practices[93].

- A 'Sustainable Farming Scheme' is commencing in Wales in 2026. This scheme is dedicated to making it easier for farmers to continue producing high quality food sustainably and meet commitments to nature, the environment, and climate change, which is a key opportunity to improve flood management, reduce flood risk, and reduce contributions to climate change from agricultural land in Carmarthenshire[94].

[93] NRW (no date) Welsh Information for Nature Based Solutions (WINS). Available at: https://smnr-nrw.hub.arcgis.com/apps/036c04ccb85948d2abe7312de75ad318/explore [Accessed: 21.01.25]
[94] Welsh Government (2024) Sustainable Farming Scheme: Proposed scheme outline. Available at: https://www.gov.wales/sustainable-farming-scheme-proposed-scheme-outline-2024 [Accessed: 21.01.25]

5 Water

5.1 Baseline Conditions

5.1.1 Carmarthenshire is within the Western Wales River Basin District (RBD), which covers an area of 16,653 km^2. Around 70% of the districts coastline is designated in UK law for its environmental quality, including many world class bathing beaches and internationally important conservation sites. All groundwater in this RBD forms part of a Drinking Water Protected Area (DrWPA)[95].

5.1.2 Carmarthenshire has a rich and intricate network of rivers and streams ranging from narrow, deeply incised upland streams to the gentler lowland meandering sections of the river Tywi[96], which form part of the Carmarthen Bay and Gower Management Catchment. This includes the rivers Taf, Tywi, Gwendraeth Fach, Gwendraeth Fawr, Loughor, Lliw, Llan, the streams of North and South Gower and the estuaries and coastal waters of Carmarthen Bay. The area stretches from Narberth in the west, to the western suburbs of Swansea in the east and encompasses the Black Mountain – the western part of the Bannau Brycheiniog National Park from which the headwaters of the Loughor emanate – and the southern foothills of the Cambrian Mountains, the source of the Tywi[97]. There are 42 protected areas in this catchment, see Table B-5 below.

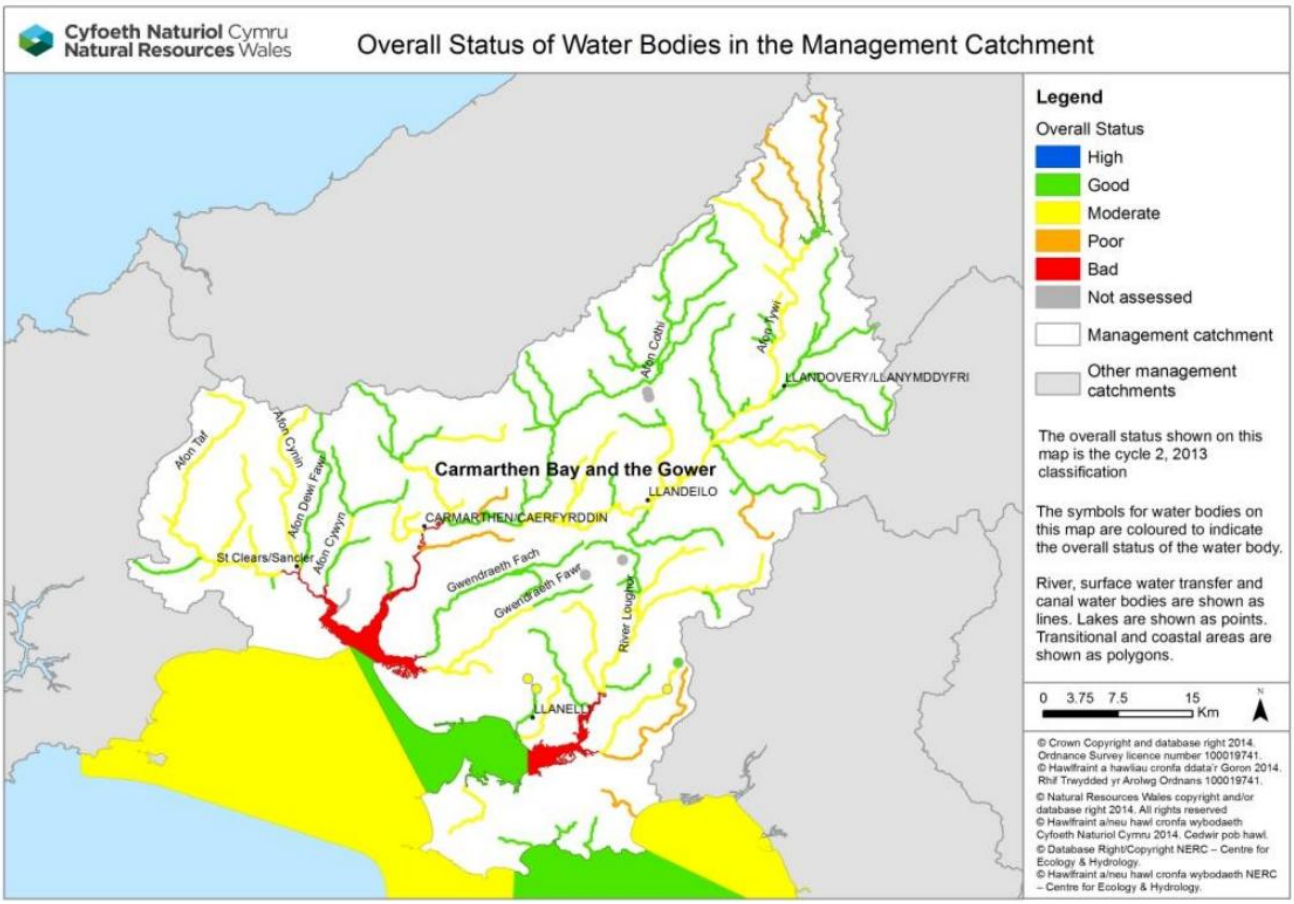
Table B-5: Protected areas in the Carmarthen Bay and Gower Management Catchment

Protected Area	Number
Bathing Waters	13
Drinking Water Protection Areas	17
Natura 2000 and Ramsar Sites	15
Shellfish Waters	5
Urban Wastewater Treatment Directive – Sensitive areas	2

5.1.3 The status of each water body is illustrated in Figure B-15 below, where the majority of waterbodies are classified as in 'Moderate' quality, and none of 'High' quality. There are no bathing waters in poor quality, with the vast majority in Carmarthenshire are all listed as 'Good' or 'Excellent', which are located around and within Carmarthen Bay and Gower[98]. Bathing waters include Pembrey and Pendine, both of which are listed as in 'Excellent Quality'[99].

[95] Natural Resources Wales (2022) Western Wales River Basin Management Plan 2021-2027. Available at: https://naturalresourceswales.gov.uk/media/695227/western-wales-rbmp-2021_2027-summary.pdf [Accessed: 30.11.24]
[96] Carmarthenshire County Council (no date) Carmarthenshire Nature Recovery Plan – Freshwater Habitats. Available at: https://www.carmarthenshire.gov.wales/media/1216364/freshwater-habitats-new.pdf [Date accessed: 30.11.24]
[97] Natural Resources Wales (2022) Carmarthen Bay and Gower Management Catchment. Available at: https://naturalresources.wales/media/681008/2016-updated-carmarthen_bay_catchment_summary_nrw.pdf [Accessed: 30.11.24]
[98] Natural Resources Wales (2023) Find a bathing water. Available at: https://environment.data.gov.uk/wales/bathing-waters/profiles/ [Accessed: 30.11.24]
[99] Carmarthenshire County Council (2023) Bathing water. Available at: https://www.carmarthenshire.gov.wales/home/council-services/environmental-health/bathing-water/ [Accessed: 21.01.25]

Figure B-15: Overall status of water bodies in the Carmarthen Bay and Gower Management Catchment[97]



Source: Natural Resources Wales (2022)

5.1.4 Dŵr Cymru Welsh Water is responsible for Carmarthenshire's water resources, 95% of which originate as surface water from either reservoir storage or river abstractions, and dependence on ground water supplies is low[100]. NRW and the Environment Agency are responsible for ensuring the sustainable use of water resources in Wales and England[100].

5.1.5 The NRW 'Assessment of water quality in protected rivers in Wales' assesses the compliance of Wales's river SACs in relation to targets for seven water quality attributes: Dissolved Oxygen, Biochemical Oxygen Demand, Total Ammonia, Unionised Ammonia, Trophic Diatom Index, pH, Acid Neutralising Capacity. River SACs in Carmarthenshire which failed to meet water quality targets were the River Teifi and Cleddau Rivers, with failures due to a lack of Biochemical Oxygen Demand and failure to meet the target for the Trophic Diatom Index[101]. Elevated nutrient concentrations pose a significant risk of adverse ecological impacts. To safeguard water quality and reduce this risk, phosphorus targets have been implemented across Wales. While the River Teifi has been found to marginally exceed these targets, the Cleddau Rivers exhibit widespread failures, with magnitudes ranging from low to high[102].

[100] Dŵr Cymru Welsh Water (2024) Water Resources. Available at: https://www.dwrcymru.com/en/our-services/water/water-resources [Accessed: 30.11.24]
[101] NRW (2019) Assessment of Water Quality in protected rivers in Wales. Available at: https://naturalresourceswales.gov.uk/evidence-and-data/research-and-reports/water-reports/assessment-of-water-quality-in-protected-rivers-in-wales/?lang=en [Accessed: 21.01.25]
[102] NRW (no date) Compliance Assessment of Welsh River SACs against Phosphorous Targets. Available at: https://cdn.cyfoethnaturiol.cymru/693025/compliance-assessment-of-welsh-sacs-against-phosphorus-targets-final-v10.pdf?mode=pad&rnd=132557227300000000 [Accessed: 21.01.25]

5.1.6 There are 261 stations of monitored water levels across Wales, and levels in Carmarthenshire vary greatly[103]. The Carmarthenshire County Council identified 49 communities across Carmarthenshire as areas which are at the greatest risk of surface water and ordinary watercourse flooding, which includes Llangennech (One of the communities most effected by a major flooding event in 2014), Abergwili Whitemill, and Burry Port Gors Road[107].

5.1.7 The Water Act is the primary legislation governing the management of water resources in the UK[104]. However, no single organisation is solely responsible for managing flood risk in Carmarthenshire. In Wales, Flood and Coastal Erosion Risk Management (FCERM) involves collaboration among multiple organisations, including 28 Risk Management Authorities (RMAs), which are required to cooperate on FCERM activities such as schemes and reporting. Carmarthenshire County Council also plays a key role as a Sustainable Drainage Approval Body (SAB)[105]. Additionally, the Carmarthenshire Bay Abstraction Licensing Strategy outlines how water resources in the catchment are managed, providing guidance on the regulation of existing abstraction licences and the availability of water for further abstraction[106]. Under the Flood and Water Management Act 2020, Carmarthenshire became a Lead Local Flood Authority (LLFA), which enforced the development, maintenance, application and monitoring of a strategy for local flood risk management[107].

5.1.8 All projects undertaken in the fluvial, estuarine, or coastal environment must undergo a Water Framework Directive (WFD) compliance assessment[108]. The WFD provides a major overarching framework for river basin management in the Carmarthen Bay and Gower Catchment. Within this, The Floods Directive sets out a strategic approach to flood risk management planning, which details how flood risk is proposed to be managed across Carmarthenshire. The flood risk management plan and the river basin management plan shape important decisions, direct considerable investment and action, and deliver significant benefits to society and the environment[97].

5.1.9 In Carmarthenshire, local flood risk flooding is from surface water run-off, groundwater, and ordinary watercourses, which usually occurs through smaller watercourses exceeding their capacity. There has been significant flooding recorded in previous years, with the worst flooding occurring in 1987. In 2018, Storm Callum caused widespread flooding, with communities across the county significantly affected, Carmarthen, Llanydder and Pont Tyweli in particular. Storm Denis (2020) and Storm Christoph (2021) also had a considerable impact on council services and emergency response[109].

5.1.10 Key efforts from 2023/2024 flood risk management in Wales include an investment of £56.6m of Welsh Government funding on key flood risk management activities to NRW, the completion of a significant flood alleviation scheme in Ammanford, Carmarthenshire, that protects 223 properties, a

[103] Natural Resources Wales (2024) River levels, rainfall and sea data. Available at: https://rivers-and-seas.naturalresources.wales/?lang=en
[104] Legislation.gov.uk (2014) The Water Act. Available at: https://www.legislation.gov.uk/ukpga/2014/21/contents [Accessed: 21.01.05]
[105] Welsh Government (2020) Summary for the National Strategy for Flood and Coastal Erosion Risk Management in Wales. Available at: https://www.gov.wales/sites/default/files/publications/2021-03/summary-of-the-national-strategy-for-flood-and-coastal-erosion-risk-management-in-wales.pdf [Accessed: 21.01.25]
[106] NRW (2014) The Carmarthen Bay Abstraction Licensing Strategy. Available at: https://naturalresourceswales.gov.uk/media/681149/carmarthen-bay_strategy_english.pdf [Accessed: 22.01.25]
[107] Carmarthenshire County Council (2024) Flook Risk Strategy and Management Plan. Available at: https://www.carmarthenshire.gov.wales/home/council-services/emergencies-and-community-safety/flooding/flood-risk-strategy-and-management-plan/#:~:text=We%20have%20identified%2049%20communities%20across%20Carmarthenshire%20as,Units%E2%80%99%20and%20have%20been%20evaluated%20in%20more%20detail. [Accessed: 02.12.24]
[108] NRW (2017) Updated Local Authority Services and the Water Environment. Available at: https://naturalresources.wales/media/684784/20171122-final-signed-revised-wfd-advice-note-for-local-authorities.pdf [Accessed: 21.01.25]
[109] The Carmarthenshire County Council Local Flood Risk Management Strategy (2024) A strategy for the management of flood risk across Carmarthenshire. Available at: https://www.carmarthenshire.gov.wales/media/53cl50yc/carmarthenshire-county-council-s-local-flood-risk-management-strategy.pdf [Accessed: 02.12.24]

further 824 properties directly benefiting from ongoing sustained level of flood protection provided by the capital maintenance work (undertaken by NRW), and the publication of the Flood Risk Management Plan (FRMP), which sets out the priorities for managing flood risk for the next six years[110]. NRW also offers an online service for the public to check flood warnings, current river levels, rainfall, and sea data, and a 5-day flood risk outlook[111]

5.2 Data Gaps

- Statistics of the history of river water levels in Carmarthenshire.
- Heavily Modified Waterbodies (HMWB) in Carmarthenshire.

5.3 Key Risks and Opportunities

- The frequency of flooding presents a key risk in erosion of topsoil, particularly in agricultural areas. This can reduce agricultural productivity in the counties rural landscape, impact aquatic ecosystems and water quality with increased sedimentation in water bodies and increase reliance on artificial soil management.
- Flooding can lead to contamination of water sources with pollutants such as sewage, agricultural runoff, and chemicals.
- Rising costs of flood management, infrastructure repair, and compensation for affected communities can place strain on public resources and inflict long-term stress on local businesses and residents.
- The current investment in flood risk infrastructure, SuDS, and nature-based solutions is contributing to resilience to withstand present flood risks. However, with flooding events predicted to become more severe into the future, a further understanding of how the county may be affected and the investment requirements necessary to mitigate this are required to effectively prepare for the future risks of flooding in Carmarthenshire. The Carmarthenshire Interim Action Plan for Nutrient Neutrality presents the opportunity for the design of new developments in catchments of the River Teifi and Cleddau rivers, amongst others, with the integration of SuDS and nature-based solutions. This offers an opportunity to adapt Carmarthenshire to future flooding events, and offers wider benefits to the natural environment, such as pond creation to help reduce the flow of water but also provide an alternative water source for wildlife during drought[112].
- Flood management and resilience projects can boost the local economy and create employment.
- Communities in the County have access to information and resources for flood risk, to prepare for and respond to flooding, which present a key opportunity for future community resistance to flooding.
- Carmarthenshire's bounty of natural water resources provides the opportunity to harness renewable energy from water. A key opportunity could be found in the installation of hydroelectric power projects and the integration of water-based renewable energy into the local energy network.
- The failure to meet phosphorus and water quality targets in the River Teifi and Cleddau highlights a significant opportunity for the LFRMS to enhance the management of protected rivers in Carmarthenshire, with the aim of improving ecological conditions across the county. Additionally,

[110] NaturalResources Wales (2024) Flood risk management annual report 2013 to 2024. Available at: https://naturalresourceswales.gov.uk/evidence-and-data/research-and-reports/flooding-reports-evidence-and-data/flood-risk-management-annual-report-2023-2024/?lang=en [Accessed: 02.12.24]
[111] Natural Resources Wales (2024) Flooding. Available at: https://naturalresources.wales/flooding/?lang=en [Accessed: 02.12.24]
[112] Carmarthenshire County Council (2023) Revised 2018 – 2033 Local Development Plan. Available at: topic-paper-phosphorus-oct-2023.pdf [Accessed: 21.01.25]

the ‘4 Rivers for LIFE’ project presents a valuable opportunity to support the conservation of these protected water bodies by rehabilitating and restoring the natural processes, features, and habitats of the River Teifi and Cleddau. Beyond this, the LFRMS also has the potential to focus on rehabilitating and restoring non-protected rivers in Carmarthenshire, contributing to more sustainable water management practices and reducing flood risks throughout the region[113].

- A key factor contributing to the failure of waterbodies in Wales under the WFD is the physical modification of watercourses, which has led to their disconnection from floodplains and riparian corridors. Addressing this issue could be achieved by collaborating with ongoing projects and delivery mechanisms, such as Area Statements and Opportunity Catchments, to develop and implement nature-based solutions that tackle the challenges currently affecting Carmarthenshire. The focus of Opportunity Catchments is to maximise the benefits for waterbodies and wellbeing[114], and this collaboration can offer wide benefits relating to flood risk, climate change, wellbeing, and biodiversity, and offer the opportunity for the LFRMS to mitigate any negative effects of future physical modifications on the natural environment.
- The abundance of waterbodies presents a key opportunity for tourism and eco-tourism centred around water-related landscapes and activities.

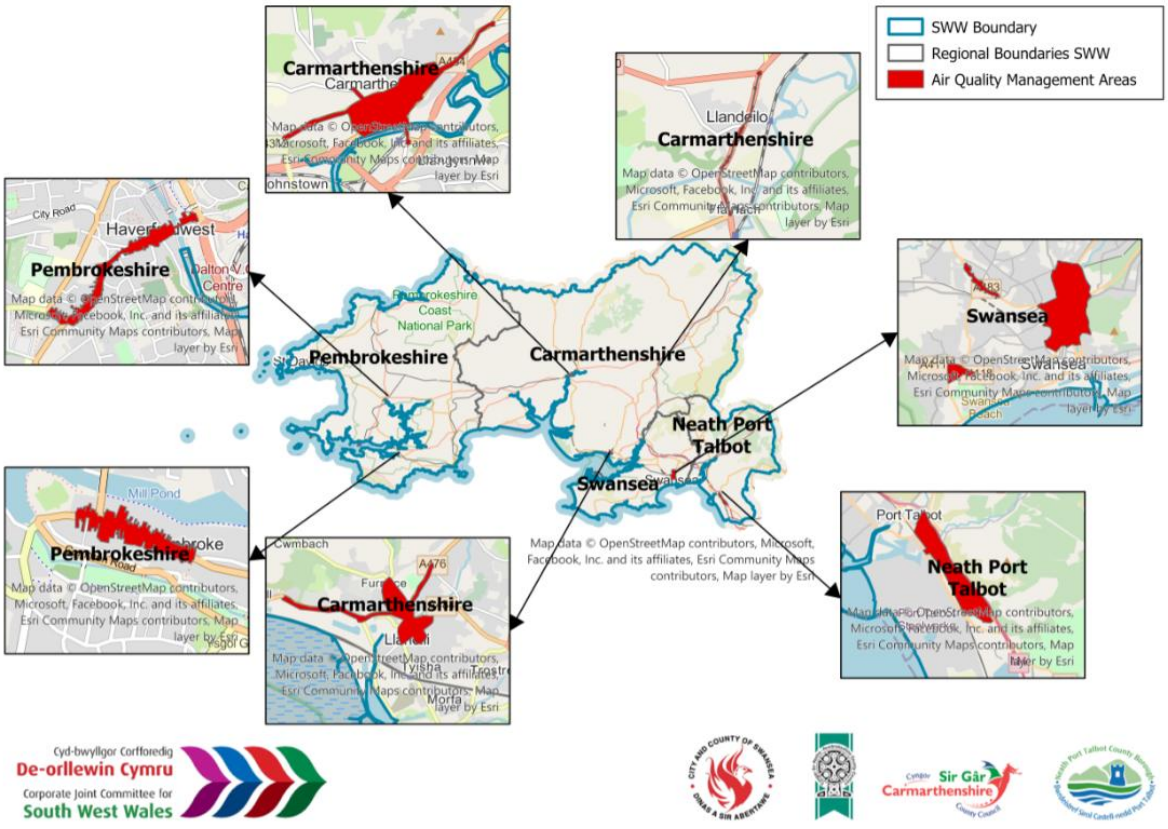
[113] NRW (no date) Four Rivers for LIFE. Available at: https://naturalresources.wales/4Riversforlife?lang=en [Accessed: 21.01.05]
[114] NRW (2023) Area Statements and Opportunity Catchments. Available at: https://naturalresources.wales/about-us/what-we-do/strategies-plans-and-policies/area-statements/sector-specific-information/area-statements-and-opportunity-catchments/?lang=en [Accessed: 21.01.25]

6 Air

6.1.1 Air pollution is a local, national and international problem caused by the emission of pollutants. In Wales, air quality is generally very good, largely due to its predominantly rural nature and historic decline in heavy industry which has resulted in a reduction in emissions of some pollutants, such as particulate matter (PM) and Nitrogen Dioxide (NO_2). However, there are some parts of the country that experience highly elevated levels of localised pollution, notably due to road traffic. Targets for NO_2, PM, nickel and polycyclic aromatic hydrocarbons are still being breached in certain parts of Wales thereby posing a threat to human health and the natural environment[115].

6.1.2 There are currently 44 designated Air Quality Management Areas (AQMAs) in Wales[116]. There are three AQMAs in Carmarthenshire (see Figure B-16).

Figure B-16: AQMAs in South West Wales

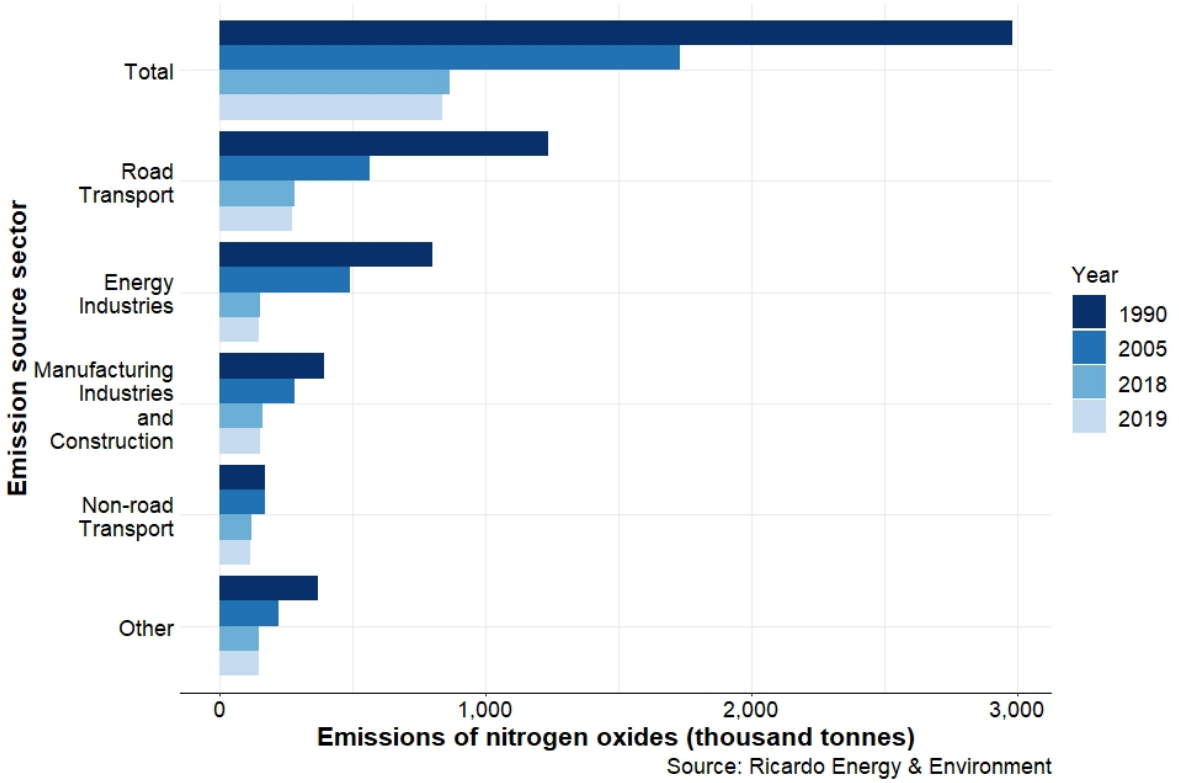


Source: Welsh Government (2021)

6.1.3 Road transport accounts for nearly a third of all NO_2 emissions in the UK and transport is the biggest source of air pollution in the UK (see Figure B-17). The major contributor to NO_x emissions in the UK is road transport, which is the sector that has also recorded the biggest decrease in emissions since 1990.

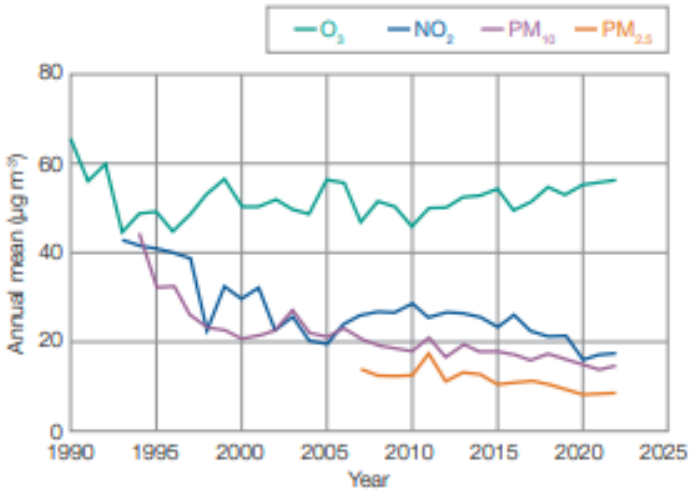
[115] Natural Resource Wales (2022) State of Natural Resources Report (SoNaRR) for Wales 2020. Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/state-of-natural-resources-report-sonarr-for-wales-2020/sonarr2020-structure-and-contents/?lang=en [Accessed: 03.12.24]
[116] Welsh Government (2021) Air Quality in Wales: Air Quality Management Areas. Available at: https://airquality.gov.wales/laqm/air-quality-management-areas [Accessed: 03.12.24]

Figure B-17: UK annual emissions of nitrogen oxides by 2019 major emissions sources: 1990, 2005, 2018 and 2019



6.1.4 Figure B-18 shows the trends in ambient air pollution from 1990 to 2022[117]. Whilst there were no instances in 2020 of EU PM_{10} air quality limits being reached; NO_2 limits were exceeded at two sites. NO_2 and is the catalyst for the designation of all (except one) AQMAs in Wales. Road transport accounts for nearly a third of all NO_2 emissions in the UK.

Figure B-18: Ambient Air Pollutant Trends in Wales 1990-2022



(Source: Air Quality in Wales 2022/23)

[117] Welsh Government (2020) Air Quality in Wales 2020. Available at: https://airquality.gov.wales/sites/default/files/documents/2021-10/AQ-Wales-2020_English_Final.pdf [Accessed: 03.12.24]

6.1.5 In 2022, ambient concentrations of PM_{10} were 'moderate' on 40 days, 'high' on 8 days and 'very high' on 1 days (as defined by the Daily Air Quality Index bandings). Overall, pollution levels in Wales were low for 284 days, moderate for 66 days, high for 14 days and very high for 1 days. Therefore, 78% of the time, pollution levels were low across the whole of Wales.

6.1.6 Several national air quality monitoring networks operate across Wales. These networks are used to ensure regulatory requirements are met and to provide information for air quality researchers, the medical community and members of the public[118].

6.1.7 A screening has taken place for Environment (Air Quality and Soundscapes) (Wales) Bill in 2023. This bill aims to improve air quality and reduce the impacts of air pollution on human health, biodiversity, the natural environment and our economy. This is aimed at a Wales-wide level, at a local and regional level and throughout society[119].

6.2 Data gaps

- Ambient air pollution data for Carmarthenshire.

6.3 Key Issues and Opportunities

- Air quality in Carmarthenshire is generally very good, reflective of its largely rural nature and high-quality natural environment. However, there are three AQMAs in Carmarthenshire.
- The LFRMS should seek to ensure that air quality is not worsened through the creation of flood management measures and should seek the improve air quality through the creation of nature-based solutions and the protection of sustainable transport infrastructure.
- Wales has some of the worst air quality in the UK, which is surprising given its low population density and relatively small cities.
- A key opportunity for increasing climate resilience in urban areas in Carmarthenshire is seen in the implementation and development of green and blue infrastructure. For example, increasing the surface area of green cover can increase the water retention capacity of the environment and mitigate against both flooding and droughts, as well as wider environmental benefits.
- Nature based solutions are a key opportunity for the LFRMS to reduce flood risk, while also contributing to the mitigation of climate change. For example, peatland restoration can enhance carbon capture within Carmarthenshire.

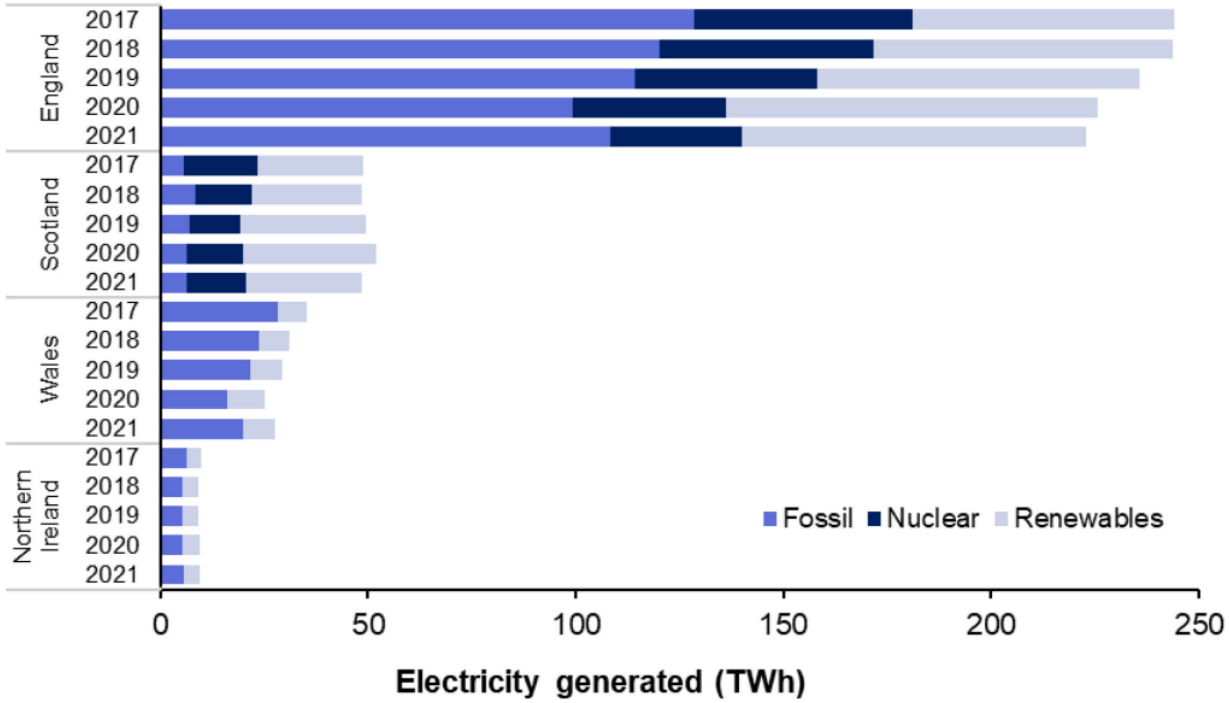
[118] Welsh Government (2022) Air Quality in Wales 2022/23. Available at: https://www.airquality.gov.wales/sites/default/files/documents/2023-11/AQ-Wales-2022-English_Final.pdf [Accessed: 03.12.24]
[119] Available at: https://www.gov.wales/sites/default/files/publications/2023-03/environment-air-quality-and-soundscapes-wales-bill-health-impact-assessment.pdf [Accessed: 03.12.24]

7 Climatic Factors

7.1 Energy Generation

7.1.1 It is estimated that Welsh renewable electricity generation is equivalent to 59% of Wales's electricity consumption on an annual basis[120]. This represents an increase of 4 percentage points compared to 2021 levels. Electricity generation from gas in Wales has increased by nearly 40% since 2020. There has been no electricity generation from nuclear and coal in Wales since 2015 and 2019 respectively. Figure B-19 below shows electricity generation by fuel in 2017-2021 for England, Scotland, Wales and Northern Ireland.

Figure B-19: Electricity Generation by fuel type from 2017 to 2021 for Wales, England, Scotland and Northern Ireland



Source: BEIS (2022)[121]

7.1.2 Between 2000 and 2013, the percentage of electricity generated from renewable energy sources increased from less than 3% to over 10%. This was largely as a result of wind generation. The use of renewable energy could help to reduce Wales's carbon footprint over time.

7.1.3 Between 2016 and 2017, there was an increase from 12.3% of energy in Wales being generated by renewables to 20.0%, an increase of 7.7% in only a year[122]. In 2019 Carmarthenshire County Council declared a climate emergency and committed to becoming a net zero carbon local authority by

[120] Welsh Government (2022) Electricity Generation in Wales 2022. Available at: https://www.gov.wales/sites/default/files/publications/2023-11/energy-generation-in-wales-2022.pdf [Accessed: 03.12.24]
[121] BEIS (2022) Electricity generation and supply in Scotland, Wales, Northern Ireland, and England, 2017 to 2021. Available at: https://assets.publishing.service.gov.uk/media/63a2dd608fa8f539108d59be/Regional_electricity_generation_and_supply_2017-21.pdf [Accessed: 03.12.24]
[122] Electricity generation and supply figures for Scotland, Wales, Northern Ireland and England, 2014 to 2017 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770766/Regional_Electricity_Generation_and_Supply.pdf [Accessed: 03.12.24]

2030[123] In 2022, renewables represented 27% of all electricity generation in Wales and there was 3,551MW of renewable electricity capacity in Wales[124]. Renewable generation increased by 19% on 2023 figures in Quarter 2 of 2024 to 32.8TWh with most of the increase being in onshore wind generation[125]. The renewable share of total electricity generation reached 51.6% in Quarter 2 of 2024.

7.2 Energy Consumption

7.2.1 Total energy use in Wales in 2017 was 86.1TWh. Total energy consumption has been falling since 2005, though more so since 2007, which coincides with the economic downturn (as of 2017). The industry and commercial sector accounts for a large proportion of this decline. While total energy use has been falling, the energy use of the transport sector has remained consistent between 2005 and 2017, leading to a higher proportion of total energy use (26%). Western coast authority areas of Wales have lower levels of transport energy use[126].

7.2.2 The Energy Use in Wales Second Edition report[127] states that between 2005 and 2019, total energy use in Wales reduced from a total of 109.9 TWh in 2005 to 92.8 TWh in 2019: a reduction of 16% over a 14-year period. Overall, industrial, commercial and domestic sectors have seen reductions in energy use since 2005. Transport accounts for an increasing share of the total energy use in Wales, rising from 20% in 2005 to 25% in 2019[128].

7.3 Greenhouse Gas Emissions

7.3.1 Total greenhouse gas emissions in Wales in 2018 amounted to 38.9MtCO_{2e}. This translates to a 31% decrease on 1990 levels, although that figure has fluctuated over the period showing a gradual decreasing trend overall. These emission reductions are mainly due to efficiencies in energy generation and business sector heating, the use of natural gas to replace some coal and other fuels as well as abatement in some chemical industries, and variations in manufacturing output (e.g. in iron and steel, bulk chemical production).

7.3.2 Wales is moving in the right direction to help combat some of the most serious causes of climate change. The increase of renewable energy production is an example of this. A reduction of overall CO_2 emissions is helping Wales and the whole of the UK meet its reduction targets. However, although moving in the right direction, change needs to happen in Wales and across the UK to ensure reduction targets are met.

7.3.3 Figure B-20 illustrates the split of emissions between different sources in Wales between 1990 and 2019. This shows that the largest contributor remains the energy supply industry. Since 1990, the sector that has decreased its proportion of emissions the most is the business sector.

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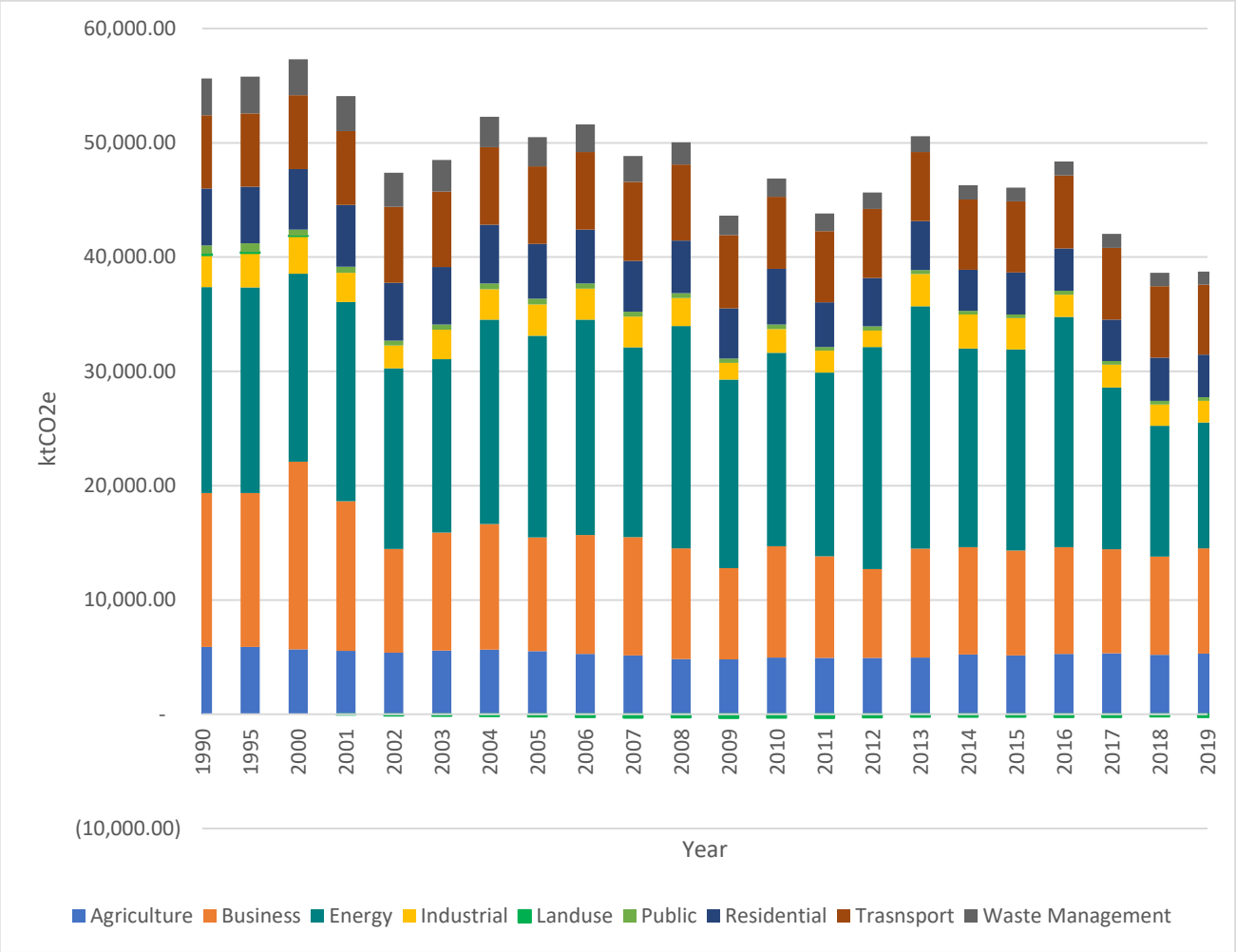
[123] Carmarthenshire County Council (2020) Route towards becoming a net zero carbon local authority by 2030. Available at: https://www.carmarthenshire.gov.wales/media/1223704/gd6245-netzerocarbon-plan3.pdf [Accessed: 22.01.25]
[124] Welsh Government (2022) Energy Generation in Wales 2022. Available at: https://www.gov.wales/sites/default/files/publications/2023-11/energy-generation-in-wales-2022.pdf [Accessed: 03.12.24]
[125] Department for Energy Security and Net Zer (2024) Energy Trends, UK, April to June 2024. Available at: https://assets.publishing.service.gov.uk/media/66f422ada31f45a9c765ec01/Energy_Trends_September_2024.pdf [Accessed: 03.12.24]
[126] Welsh Government (2018) Energy Use in Wales. Available at: https://gov.wales/energy-use-wales-2018-report [Accessed: 03.12.24]
[127] Welsh Government (2022) Energy Use in Wales Second Edition. Available at: https://www.gov.wales/sites/default/files/publications/2022-06/energy-use-wales-report.pdf [Accessed: 03.12.24]
[128] Welsh Government (2019) Welsh Housing Conditions Survey 2017-2018: Energy Efficiency of Dwellings. Available at: https://gov.wales/sites/default/files/statistics-and-research/2019-10/welsh-housing-conditions-survey-energy-efficiency-dwellings-april-2017-march-2018-795.pdf [Accessed: 03.12.24]

Figure B-20: Total Greenhouse Gas Emissions per Sector in Wales (ktCO2e)



7.3.4 The Welsh Government reported in 2024 as part of their Wellbeing of Wales report[129], that in 2021, it was estimated that emissions released into the atmosphere directly from within Wales (known as territorial emissions) totalled 36.3 million tonnes of carbon dioxide equivalent (MtCO2e), an increase of 7% compared to 2020. Most of the increase in 2021 is due to increases in emissions from power stations, iron and steel production, and road transport, consistent with greater activity in these sectors following the COVID-19 pandemic. Despite this increase in 2021, estimated Welsh emissions remain 6% below the 2019 pre-pandemic level.

7.3.5 The largest source of estimated emissions comes from the energy supply sector, which produces 26% of all greenhouse gas emissions in Wales. This sector is dominated by emissions from gas power stations. The business sector is the second largest source making up 24% of Welsh emissions. This sector is dominated by the combustion of fossil fuels in industrial production, primarily from iron and steel production.

7.3.6 The global increase of temperatures worldwide has led to increasing sea levels as a result of melting within the cryosphere, amongst other factors. This promotes the increase in frequency and severity of flooding and other climate change risks such as heatwaves and drought in Wales[130], and can be seen

[129] Welsh Government (2024) Wellbeing of Wales, 2024. Available at: https://www.gov.wales/wellbeing-wales [Accessed: 03.12.24]
[130] UK Climate Risk (no date) Evidence for the third UK Climate Change Risk Assessment (CCRA3). Available at: https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA-Evidence-Report-Wales-Summary-Final.pdf [Accessed: 22.01.25]

in Carmarthenshire through its history of flooding events. Between November 1931 and March 2008, there are 7 main flooding events recorded throughout Carmarthenshire. However, between 2008 and 2024, flooding has occurred more than once per year, forming a total of 36 reported main flooding events within the county over a 16-year period[131]. Localities surrounding Carmarthen Bay are at a high risk of flooding from the sea, whereas localities along the River Tywi such as St Clears, Carmarthen, Llandeilo, and Llandovery all have a high risk of flooding from rivers[132], which may increase in frequency as the climate changes. There are also 1,037 undefended properties and 775 defended properties at risk of flooding in Carmarthenshire as of 2024[133].

7.4 Data Gaps

- Specific data on the contribution of flood risk management measures to greenhouse gas emissions.

7.5 Key Issues and Opportunities

- The landscape is also suited for solar and hydroelectric power, and investments in this renewable infrastructure can not only help meet local energy demands but also support Wales's transition to net zero emissions. This should be considered when considering flood risk management solutions.
- A key opportunity for increasing climate resilience in urban areas in Carmarthenshire is seen in the implementation and development of GBI. For example, increasing the surface area of green cover can increase the water retention capacity of the environment and mitigate against both flooding and droughts, as well as wider environmental benefits[35].
- Nature-based solutions are a key opportunity for the LFRMS to reduce flood risk, while also contributing to the mitigation of climate change. For example, peatland restoration can enhance carbon capture within Carmarthenshire.
- The reduction of industrial, commercial, and domestic energy use since 2005 indicates positive progress towards energy efficiency, which presents an opportunity to further promote energy saving technologies and sustainable practices in these sectors.
- The reliance on high-emission industries, particularly iron and steel production and gas powered energy supplies poses a significant risk to achieving net zero targets. Without substantial investment in cleaner technology and renewable energy, Carmarthenshire risks falling behind its climate commitments.
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[131] Carmarthenshire County Council (2024) Flood history in Carmarthenshire. Available at: https://www.carmarthenshire.gov.wales/home/council-services/emergencies-and-community-safety/flooding/flood-history-in-carmarthenshire/ [Accessed: 04.12.24]
[132] Natural Resources Wales (2024) Flood and coastal erosion risk maps. Available at: https://flood-risk-maps.naturalresources.wales/?locale=en [Accessed: 04.12.24]
[133] StatsWales (2024) Properties at Risk of Flooding 2024. Available at: https://statswales.gov.wales/Catalogue/Environment-and-Countryside/Flooding/propertiesatriskoffflooding2024 [Accessed: 22.01.25]

8 Cultural Heritage and Archaeology

8.1 Listed Buildings

8.1.1 Welsh Government is required by law to compile lists of buildings of special architectural or historic interest and listed buildings. The lists are used to help planning authorities make decisions with the interests of the historic environment clearly identified. Compilation of the lists is undertaken by Cadw. Listed buildings are classified in grades to show their relative importance. The grades are[134]:

- I - Buildings of exceptional, usually national, interest. Currently, fewer than two per cent of buildings listed in Wales qualify for this grade;
- II* - Particularly important buildings of more than special interest; and
- II - Buildings of special interest, which warrant every effort being made to preserve them.

8.1.2 There are over 30,000 Listed Buildings (Grade I, Grade II and Grade II*) within Wales distributed across its counties varying from medieval halls and castles to Edwardian villas. Approximately 1,800 are located in Carmarthenshire.

8.2 Scheduled Monuments

8.2.1 Cadw compile and maintain a Schedule of Monuments. The monuments included on this Schedule are of national importance and cover a diverse range of archaeological sites. Some examples may be completely buried below ground and may only be known through archaeological excavation. Others are more prominent and include the great standing ruins of well-known medieval castles and abbeys. The oldest known example in Wales is a natural cave — found to contain the earliest evidence of people in Wales — dating to a quarter of a million years ago. At the other end of the spectrum are twentieth-century military structures. Scheduled Monuments are often in a ruinous or semi-ruinous condition or take the form of earthworks[135].

8.2.2 Over 4,000 Scheduled Monuments have now been scheduled across Wales and the number is increasing as part of an ongoing planned policy of enhancing the Schedule. There are 370 Scheduled Monuments in Carmarthenshire.

8.3 Historic Landscape

8.3.1 Cadw has compiled a register of landscapes of historic interest in Wales. 58 historic landscapes have been registered, which are considered to be best examples of different types of historic landscapes. The register promotes the conservation of the key characteristics of historic landscapes as those landscapes evolve. The Taf and Tywi estuary, Tywi valley, Black Mountain, and Dolaucothi are historic landscapes present within Carmarthenshire[136].

[134] Cadw (2021) Listed Buildings. Available at: https://datamap.gov.wales/layers/inspire-wg:Cadw_ListedBuildings [Accessed: 02.12.24]
[135] Cadw (2021) Scheduled Monuments. Available at: https://datamap.gov.wales/layers/inspire-wg:Cadw_SAM [Accessed: 02.12.24]
[136] Data Map Wales (2014) The registered landscapes of outstanding and of special interest in Wales. Available at: https://datamap.gov.wales/layers/inspire-wg:Cadw_HistoricLandscapes [Accessed: 02.12.24]

8.4 Conservation Areas

8.4.1 There are over 500 Conservation Areas in Wales. They are designated by local planning authorities for their special architectural and historic interest[137]. Many local planning authorities have undertaken Conservation Area character appraisals which identify areas where enhancement through development may be desirable.

8.4.2 Conservation Areas in Wales are distributed throughout its counties and are largely situated within urban settlements from small villages to areas within towns and cities. There are 28 Conservation Areas in Carmarthenshire.

8.5 Historic Parks and Gardens

8.5.1 Wales has a rich inheritance of historic parks and gardens. They form an important and integral part of the historic and cultural fabric of the country[138]. There are 190 Historic Parks and Gardens in Carmarthenshire.

8.5.2 Cadw has undertaken a comprehensive survey of historic parks and gardens in Wales. Those thought to be of national importance are included on the Cadw / ICOMOS Register of Parks and Gardens of Special Historic Interest in Wales. The Register was compiled in order to aid the informed conservation of historic parks and gardens by owners, local planning authorities, developers, statutory bodies and all concerned with them. Through the Historic Environment (Wales) Act 2016[139] it is now statutory and has six volumes. It was completed in 2002, however, sites can be added (or subtracted) at any time. There are currently almost 400 sites on the Register.

8.5.3 Sites on the Register are Graded I, II* and II in the same way as listed buildings. Approximately 10% are Grade I and 23% Grade II*.

8.5.4 Parks and gardens on the Register range from medieval to late twentieth century. Many are multi-period, with features of different styles and periods.

8.6 Heritage at Risk

8.6.1 A key element of Cadw's heritage regeneration activity is action related to heritage assets in a deteriorating condition. Cadw has been working to identify the number and type of listed buildings at risk in Wales[140]. Surveys of the condition of listed buildings have been carried out in Wales for more than 15 years. 2015 data shows that the trend for buildings at risk is moving in the right direction. The number of buildings in an 'at risk' or 'vulnerable' condition has decreased since the last comparable data available (2013) and the percentage of buildings at risk has fallen from 8.92% to 8.54%. This figure is calculated using existing survey data and the most up-to-date data available from the 20% of the building stock which has been re-surveyed in the past year. The percentage of building at risk over time has fallen since 2013.

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[137] Welsh Government (2022) Conservation Area Boundaries. Available at: https://datamap.gov.wales/layers/inspire-wg:conservation_areas [Accessed: 02.12.24]
[138] Cadw (2021) Registered historic parks and gardens. Available at: https://cadw.gov.wales/advice-support/placemaking/legislation-guidance/registered-historic-parks-and-gardens [Accessed: 02.12.24]
[139] Historic Environment (Wales) Act 2016. Available at: https://www.legislation.gov.uk/anaw/2016/4/contents [Accessed: 02.12.24]
[140] Cadw (2021) Listed buildings at risk. Available at: https://cadw.gov.wales/advice-support/historic-assets/listed-buildings/listed-buildings-risk#section-managing-listed-buildings-at-risk [Accessed: 02.12.24]

8.6.2 Over time, there have been additional buildings given listed status. The Historic Environment (Wales) Act 2016 aims to give more effective protection to listed buildings and scheduled monuments, to improve the sustainable management of the historic environment and to introduce greater transparency and accountability into decisions taken on the historic environment. These seek to preserve the cultural heritage and historic environment of Wales and in turn will provide greater financial gain for the Welsh tourism sector.

8.7 Data Gaps

- The heritage value of water-related infrastructure.
- Climate change impacts on cultural heritage in Carmarthenhsire.
- Specific heritage assets in Carmarthenshire at risk of present and future flooding.

8.8 Key Issues and Opportunities

- Flooding presents a key risk to the integrity and conservation of Carmarthenshire's abundance of listed buildings, Parks & Gardens, Scheduled Monuments, and Conservation Areas, which form an integral part of the historic and cultural fabric of Wales. Increasing investment to and the management of water bodies and flooding throughout Wales presents a key opportunity to conserve the cultural heritage of Carmarthenshire.
- The Historic Environment Group (HEG) is a high-level forum designed to include a strategic overview of issues and opportunities in the historic environment in Wales, and to promote common approaches to their protection. This is a key opportunity for the present and future protection of heritage assets from flooding in Carmarthenshire, and the LFRMS could collaborate with the HEG to enhance the understanding of environmental threats to heritage to assets in the county and mitigate these risks[141].
- The Royal Commission on the Ancient and Historical Monuments of Wales has mapped the historical boundaries of Wales to make them freely available[142]. There is an opportunity to commission local refinement of the spatial mapping to the Carmarthenshire scale presented here, which could inform the LFRMS on key areas at risk of flooding and can then be addressed within the strategy.

[141] NRW (2020) Historic Environment and Climate Change in Wales – Sector Adaptation Plan. Available at: https://cadw.gov.wales/sites/default/files/2020-02/Adaptation%20Plan%20-%20FINAL%20WEB%20-%20English%20%281%29.pdf [Accessed: 22.01.25]
[142] Royal Commission on the Ancient and Historical Monuments of Wales (2024) Historical Boundaries. Available at: https://rcahmw.gov.uk/launch-of-the-historical-boundaries-of-wales-website/ [Accessed: 22.01.25]

9 Landscape

9.1.1 Wales has a varied and generally high-quality landscape with over 50% of the land area being nationally valued for its scenic quality and character. Many Welsh landscapes are iconic with a clear sense of place and recognisable identity. The country is predominantly rural in character with 59% of the landscape defined as Field Pattern/Mosaic and 20% is categorised as Open Land[143]. Known locally as the 'Garden of Wales', Carmarthenshire is home to diverse landscapes including mountains, Ancient Woodlands, rolling grasslands, and sandy beaches[144].

9.1.2 Climate change over time is likely to have significant impacts on landscape character, local distinctiveness and quality, directly through changing land cover (migrating habitat and species ranges) and indirectly by influencing land use decisions. Landscape changes may also be evident from mitigation measures, such as renewable energy generation, water resource management and adaptation through the planned expansion of woodland. Climate change also poses a risk to landscapes from pests, pathogens and invasive species and from changes in frequency and/or magnitude of extreme weather and wildfire events.

9.1.3 A total of 25% of Wales is designated as either National Park or a National Landscape. There are currently no National Landscapes within Carmarthenshire, though the Black Mountains in the county are a part of the Bannau Brycheiniog National Park [145].

9.2 Protected Landscapes

9.2.1 Within Wales there are three National Parks; Bannau Brycheiniog (previously known as Brecon Beacons), Pembrokeshire Coast and Eryri (previously known as Snowdonia).

9.3 Quality of Landscapes

9.3.1 The most detailed landscape baseline in Wales reporting on landscape state, condition and trend is LANDMAP[146]. LANDMAP is an all-Wales landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated. LANDMAP explains the physical, geological, ecological, visual, historic and cultural landscape: the summary descriptions, evaluations and management recommendations aid understanding of landscape and identify important landscape qualities and characteristics. By capturing multi-dimensional landscape information, it ensures that all aspects of the landscape can be taken into account. It is the focus for landscape monitoring in Wales, enabling the tracking of change and identifying key factors determining landscape change, condition and resilience.

9.3.2 Landscape Character Areas (LCAs) are identified at both a local planning authority level and at a national level, with 48 National Landscape Character Areas (NLCA) identifying regional landscapes.

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[143] Natural Resources Wales (2018) Updated All Wales LANDMAP Statistics 2017 Visual and Sensory Aspect. Available at: https://cdn.cyfoethnaturiol.cymru/media/684055/landmap-visual-and-sensory-all-wales-stats-2017.pdf?mode=pad&rnd=131625599140000000 [Accessed: 02.12.24]
[144] Best of Wales (no date) Carmarthenshire West Wales. Available at: https://www.bestofwales.co.uk/carmarthenshire#area_location_overlay_quick-search-form [Accessed: 22.01.25]
[145] Natural Resources Wales (2024) Interactive map viewer. Available at https://experience.arcgis.com/experience/dd852f0e12864928973e3e165a1b4631/ [Accessed: 02.12.24]
[146] NRW (2024) LANDMAP - the Welsh landscape baseline. Available at: https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/landmap-the-welsh-landscape-baseline/?lang=en [Accessed: 02.12.24]

They offer overall landscape summaries linked to the five LANDMAP layers, key characteristics, and forces for change, and may be linked to design or sensitivity studies.

9.3.3 Special Landscape Areas that identify areas of high landscape importance, often linked to LCAs, are identified by some authorities. Within Wales there are many of these landscapes designated. Carmarthenshire's Special Landscape Areas are all defined as either river valleys, upland landscapes, or coastal landscapes, the county is home to 18. These include the Tywi Valley, the Bran Valley (north of Llandovery), Teifi Valley, Lower Taf Valley, Carmarthen Bay, and the historic features of the village of Talley[147].

9.4 Marine Character Areas

9.4.1 Approximately 70% of Wales's coastline is designated or registered National Landscape, National Park, Heritage Coast or Historic Landscape[148]. Seascape information complements available landscape information and together the two types of information provide an understanding of the cultural benefits to be had from the marine environment. The national Marine Character Areas (MCAs)[149] provide comprehensive seascape information for the Carmarthenshire coastline.

9.5 Dark skies

9.5.1 Dark sky areas are a good indicator of very low light pollution. There are several locations in Wales that have been nationally and internationally recognised as part of a dark sky places programme. NRW has undertaken research into the dark skies of Wales, identifying that 68.1% of Wales falls into the darkest band, as defined by the study. Mid-Wales was identified as the darkest region, and 95% of the three National Parks and five National Landscapes fell within the two darkest categories. Whilst potentially influenced by the sensitivity of satellite sensors in the LED wavelengths, the amount of light emitted in cities appears to be decreasing, but the areas around cities seem to be getting brighter[150]. This is particularly evident around Cardiff and Newport.

9.5.2 The NRW commissioned a tranquil areas assessment in 2009, following an earlier assessment in 1997[151]. This identified 55% of Wales (11,600 km^2) as tranquil in 2009, a loss of 1,500km^2 of tranquil landscapes from 1997.

9.5.3 The two largest Tranquil Areas on the 2009 Map are both over 1,000km^2. These areas are parts of the Berwyn Mountains, bordered by the towns of Dolgellau, Bala, Llangollen and Welshpool, and the southern part of the Cambrian Mountains, bordered by Llangurig, Rhayader, Llandovery, Lampeter and Tregaron.

9.5.4 Between 1997 and 2009, there was a loss of Tranquil Areas of nearly 1,500km^2 of land. This is over 6% of the total land area of Wales; and is greater than the area of the Bannau Brycheiniog National Park.

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[147] Carmarthenshire local development plan (2014) Appendix 4: Special Landscape Areas. Available at: https://www.cartogold.co.uk/CarmarthenshireLDP/english/text/Appendix-4.htm [Accessed: 05.12.24]
[148] Welsh Government (2019) Welsh National Marine Plan. Available at: https://www.gov.wales/welsh-national-marine-plan [Accessed: 02.12.24]
[149] NRW (2021) Marine Character Areas. Available at: https://naturalresources.wales/evidence-and-data/maps/marine-character-areas/?lang=en [Accessed: 02.12.24]
[150] Green C, Manson D, Chamberlain K 2021. Tranquillity and Place – Dark Skies. NRW Report No: 514, 70pp.
[151] NRW (2017) Tranquil Areas Wales. Available at: https://datamap.gov.wales/layergroups/inspire-nrw:TranquilAreasWales [Accessed: 02.12.24]

9.5.5 A nationally consistent Tranquillity and Place resource has been produced by Natural Resources Wales to ensure access to dark skies information is available for planning[152].

9.6 Data Gaps

- Up-to-date data relating to tranquillity
- Data related to soundscapes

9.7 Key Issues and Opportunities

- Opportunities to address the landscape challenges of climate change arise in climate resilient flood risk strategies including support for local species, habitat restoration projects, and wildlife corridors, which can all aid in how the landscape of Carmarthenshire adapts to changes in climate.
- The loss of tranquil areas within Carmarthenshire and Wales presents a key risk to the county's historical landscape. The protection and maintenance of those that remain can develop the historical natural landscape while offering an opportunity for the LFRMS to implement nature-based flood management techniques within these areas.
- The conservation and enhancement of the landscape of the Bannau Brycheiniog National Park can offer a wide range of environmental benefits while also contributing to the reduction of flood risk in Carmarthenshire. Nature based solutions such as reforestation and woodland management can enhance biodiversity and improve air quality, while also offering flood risk reduction through root systems aiding in the stabilisation of soil. This support can also develop resilient ecological networks at a landscape scale, enabling landscape adaptation to climate change.
- The scenic and high-quality landscape within Carmarthenshire presents opportunities to develop eco-tourism, local identity, and branding surrounding its valuable natural features.
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[152] Natural Resources Wales (2022) Dark Skies and Light Pollution in Wales. Available at: https://luc.maps.arcgis.com/apps/opsdashboard/index.html#/1cd6ba8a1d7d4a62aff635cfcbaf4aec [Accessed: 05.12.24]

Appendix C

Consultation Comments and Responses

February 2025

Table C-1: Consultation Comments from Natural Resources Wales and Responses/ Actions

Reference	Consultation Comment	Arcadis Response	Action
General	**Consideration of flood risk is needed for each topic**, in relation to the draft LFRMS. The current baseline information, key sustainability issues and opportunities are quite generic, and it is not clear how they link to flood risk, including how the draft LFRMS addresses the issues or delivers the opportunities.	Noted with thanks	Each section now refers back to the LFRMS and flood risk.
	We would expect that the SEA Scoping Report would help to influence, inform and update the draft LFRMS, **including more details about the objectives, measures and actions** would help to demonstrate this.	Noted with thanks	Consideration of each of the SEA Objectives is present throughout Appendix B, most notably in the 'Key Issues and Opportunities' sections of each chapter.
	Include more consideration for the national, regional and local scale, rather than UK level, given that areas such as environment, agriculture, fisheries, planning and energy are devolved	Noted with thanks	App A and B refer back to Carmarthenshire and the local scale when information is available.
	As this is a second cycle plan, we suggest **it should draw more on what has been learnt from the implementation of the first cycle**. What was monitored from the first cycle SEA and how have the results of the monitoring fed into the baseline data/environmental context for this round? How has the learning from the first cycle influenced this second cycle?	Noted with thanks	Detail included in the LFRMS itself.
Introduction	There have been updates recently to the Properties at Flood Risk data, there are approximately 273,000 properties at flood risk within Wales. Property figures are also available at the CCC scale for both present day and climate change at https://statswales.gov.wales/Catalogue/Environment-and-Countryside/Flooding/propertiesatriskofflooding2024 (Heading 1.1.1)	Noted with thanks	Properties at risk of flooding in Carmarthenshire is within Appendix B – Population.
	There isn't currently sufficient reference to:	Noted with thanks	Included reference to and explanation of coastal squeeze,

Reference	Consultation Comment	Arcadis Response	Action
Biodiversity (Page 11)	• Coastal squeeze and the impact of coastal squeeze on the Marine Protected Area network • Green Infrastructure (urban or rural) or SUDs. • Physical modifications to watercourses, and the impact on biodiversity		green infrastructure, and physical modifications to watercourses within the 'Key Issues and Opportunities' Section of Appendix B and summary table on Page 11 of the main report. Updates to SEA Framework made.
	National Resources Wales (NRW) should be **corrected to Natural Resources Wales** (NRW) here and throughout.	Noted with thanks	Amended references to Natural Resources Wales throughout.
	The LNRAP has already been published for the period 2020 to 2030 https://www.carmarthenshire.gov.wales/council-services/planning/biodiversity/carmarthenshire-nature-partnership/#:~:text=Welsh%20Government%20have%20produced%20a,and%20then%20reverse%20that%20decline and it is supported by the recently published State of Nature Report https://www.wwbic.org.uk/wp-content/uploads/2024/09/Carms-SoN-summary-doc-ENG.pdf	Noted with thanks.	The State of Nature Report has now been utilised and referenced to within Appendix B.
	Suggest **revision of wording of "changes to natural processes such as flash flooding",** as flooding is a natural process.	Noted with thanks	Wording revised in Appendix B – Biodiversity, Flora, and Fauna
Water (Page 13)	**Challenge the following statement** "the current investment in flood risk infrastructure is producing resilience to withstand future risks" please refer to https://naturalresources.wales/evidence-and-data/research-and-reports/flooding-reports-evidence-and-data/long-term-investment-requirements-for-flood-defences-in-wales/?lang=en and https://nationalinfrastructurecommission.wales/floodingreport/	Noted with thanks	Updated point in section 5.3, included reference to other flood management techniques and expanded upon this point regarding future risks.
Table 5.1 The proposed SEA Framework	It would be beneficial if the **objectives and or measures of the draft LFRMS were included here**, to provide an overview of the strategy, and clarity on how the SEA objectives and questions help to monitor the impacts (positive or negative).	Noted with thanks	The SEA Objectives are present in the Non-Technical Summary and Section 2 of the Main Report with elaboration on what each Objective aims to achieve. The

Reference	Consultation Comment	Arcadis Response	Action
			Measures are located within Chapter 1 and Chapter 4, with a description of how each measure intends to manage flood risk within the strategy.
	SEA Objective 1 Suggestion to include more explicit reference to ecosystem services and ecosystem resilience within the decision aiding questions, and overall objective, through its 4 measurable attributes – Diversity, Extent, Condition and Connectivity of ecosystems. Suggested inclusion of "Will the strategy... deliver nature based solutions that result in more natural hydrological flow regimes and greater ecological resilience within catchments.'	Noted with thanks	Suggested inclusion added. Further 'Decision Aiding Questions' have been included to better reflect the updates to Appendix B 'Issues and Opportunities' and include more explicit reference to biodiversity, ecosystems, and resilience.
	SEA Objective 2 Suggest revision of "Protect and enhance green networks" to "create, maintain and enhance green and blue infrastructure networks", to bring the objective in line with CCC's Green and Blue Infrastructure (GBI) Assessment and the replacement LDP objectives. GBI refers to importance of maintaining and enhancing urban habitats through GBI. Features such as urban forests, green roofs and private gardens can provide important wildlife refuges, and increase ecological connectivity and resilience. It also explains "GBI can improve connectivity between existing areas of nature, reducing habitat fragmentation and loss, and increase ecological resilience. Linear GBI features have been shown to benefit the movement of some UK species." Rivers and watercourses act as linear features that join up ecosystems across the landscape. The opportunity for the LFRMS, has not yet been considered.	Noted with thanks	Suggested revision applied. Prioritising the use of GBI to improve nature contact within urban environments has been included as a decision aiding question under SEA Objective 2, as it links to the human health theme of the objective. The further potential for GBI for ecology and biodiversity is referenced to within Appendix B under the appropriate Chapter (1 Biodiversity, Flora, and Fauna). This opportunity has now been explored in the LFRMS.
	SEA Objective 3 & SEA Objective 4	Noted with thanks	It is deemed reasonable to keep SEA Objective 3 and 4 separate,

Reference	Consultation Comment	Arcadis Response	Action
	Suggestion to merge 3 and 4; 'To protect and enhance natural resources, including water, air and soil', as it captures all, including water quality and quantity. CCC BGI Assessment highlights how "the implementation of SUDs can improve water quality, and thereby, the diversity of species such as dragonflies and molluscs downstream." There would be benefit to wording the questions to capture this opportunity. For soils, there is not only the opportunity to limit the pollution of soils, but also to limit the physical degradation of soil structure either through development or inappropriate or intensive land management practices. The question could therefore be broadened to capture this.		as water and its management is the key focus of the LFRMS. Retaining Sea Objective 3 as its own Objective provides water with the necessary level of attention. SuDS have now been referred to throughout Appendix B, with opportunities for water management, biodiversity, human health, and soil all considered.
	SEA Objective 5 GBI can have a role in increasing climate resilience in urban areas by increasing surface area of green cover. CCC GBI assessment flags role of GBI in increasing water retention capacity of the environment, which can mitigate against both droughts and flooding. Suggest inclusion on a relevant decision aiding question.	Noted with thanks	GBI has now been included in SEA Objective 5 to enhance climate resilience in urban areas.
Appendix A	**Suggested updates to:** HM Government (2009) Flood Risk Regulations 2009 The Flood Risk Regulations 2009 legislation was revoked as part of the Retained EU Legislation Act on the 31 December 2023. I**t would be appropriate to note this change.**	Noted with thanks	Removed reference to HM Government (2009) Flood Risk Regulations from Table A-1.
	Suggested updates to: Thanks for the inclusion. Please could Natural Resources Wales (2020) Marine Area Statement, Natural Resources Wales (2020) South West Wales Area Statement and Natural Resources Wales (2014) Carmarthen Bay Abstraction Licensing Strategy be listed in the Regional section.	Noted with thanks	Each statement/strategy has been moved to the Regional section of Table A-1, and removed from the National section.

Reference	Consultation Comment	Arcadis Response	Action
	We would like to highlight some significant plans, policies, strategies, and evidence sources that are currently omitted, that we would expect to be considered, and sections updated accordingly: - Welsh Government's National Strategy for Flood and Coastal Erosion Risk Management in Wales https://www.gov.wales/national-strategy-flood-and-coastal-erosion-risk-management-wales - NRW (2023) National Flood Risk Management Plan and associated documents should be noted in the National section. - NRW State of Natural Resources Report (SoNaRR) for Wales 2020 should be included in the national section, which assesses Wales's sustainable management of natural resources and sets out a range of opportunities for action. https://naturalresources.wales/evidence-and-data/research-and-reports/state-of-natural-resources-report-sonarr-for-wales-2020/?lang=en - Natural Resources Wales / Long0term Investment Requirements for Flood Defences in Wales https://naturalresources.wales/evidence-and-data/research-and-reports/flooding-reports-evidence-and-data/long-term-investment-requirements-for-flood-defences-in-wales/?lang=en - An updated Welsh Government Climate Change Strategy has been published and should be referred to https://www.gov.wales/climate-adaptation-strategy-wales-2024 - Carmarthenshire Public Service Board's Wellbeing Assessment and Well-being Plan for 2023-28 https://www.thecarmarthenshirewewant.wales/ - Carmarthenshire Local Nature Partnership State of Nature Report https://www.wwbic.org.uk/wp-content/uploads/2024/09/Carms-SoN-summary-doc-ENG.pdf - Carmarthenshire County Council Revised 2018-2033 Local Development Plan Green and Blue Infrastructure (GBI) Assessment – Technical Report December 2023 https://www.carmarthenshire.gov.wales/media/hcrh4gap/green-and-blue-infrastructure-assessment-2023.pdf - The draft Carmarthenshire green and Blue Infrastructure Strategy https://carmarthenshire-gbi-strategy-eng-luc.hub.arcgis.com/ - Carmarthenshire County Council's 'Route towards becoming a Net Zero Carbon Local Authority by 2030' https://www.carmarthenshire.gov.wales/media/1223704/gd6245-netzerocarbon-plan3.pdf	Noted with thanks	Considered all omitted significant plans, policies, strategies, and evidence sources, and have updated the UK, National, Regional, and Local sections of able A-1 accordingly.

Reference	Consultation Comment	Arcadis Response	Action
	- The Section 6 Duty from the **Environment Wales Act** should be noted in local plans, which requires public authorities, in carrying out their functions, to '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'. https://www.carmarthenshire.gov.wales/media/1221319/ccc-env-act-forward-plan-2019-report.pdf - Abstraction Strategy https://naturalresources.wales/media/681149/carmarthen-bay_strategy_english.pdf - Public Health Wales' Climate Change in Wales: Health Impact Assessment - https://phwwhocc.co.uk/resources/climate-change-in-wales-health-impact-assessment/ - Building Resilience to Flooding in Wales by 2050 – The National Infrastructure Commission for Wales https://nationalinfrastructurecommission.wales/floodingreport/ - Transport for Wales' Climate adaptation and resilience plan https://tfw.wales/sites/default/files/2023-05/CARP_ENG.pdf - Flood and Water Management Act 2010 - Land Drainage Act 1991 - Civil Contingencies Act 2004 - The Water Act 2014 - The Water Resources Act 1991		
	Guidance on planning for flooding and coastal erosion is being revised and should be noted as updates would be relevant within the LFRMS https://www.gov.wales/technical-advice-note-tan-15-development-flooding-and-coastal-erosion	Noted with thanks	Revision applied to reference to TAN 15 in Table A-1, with date changed to 2021.
	Biodiversity (Page A6) Welsh Government's Natural resources policy and Planning Policy Wales should be listed as a key documents.	Noted with thanks	Both now listed as key documents in 'Wales' Page A7
	Biodiversity (Page A6)	Noted with thanks	Wording updated as suggested in 'Implications for the LFRMS' Page A7

Reference	Consultation Comment	Arcadis Response	Action
	Reference to 'biodiversity net gain' should be updated to 'net benefit for Biodiversity and Ecosystems Resilience'		
	Population (Page A7) Implications of the LFRMS should be broader than flood risk infrastructure, particularly given the objectives of the LFRMS include to "Educate, advise, and empower our communities to become more resilient" and "Promote and support community adaption and partnership working".	Noted with thanks	Addition made to 'Implications for the LFRMS' Under 'Population' Page A9.
	Human Health (Page A9) The health implications of flood risk not yet considered, suggest reference to PHW's Health Impact Assessment https://phwwhocc.co.uk/resources/climate-change-in-wales-health-impact-assessment/ in particular, further comments provided in reference to Appendix B.	Noted with thanks	Health implications of flood risk expanded in 'Implications for the LFRMS' Page A10 to further outline how the LFRMS intends to enhance human health in Carmarthenshire. Updates to SEA Framework made.
	Soil (page A10) Current implications do not consider that soil management is a nature based solution to reduce flood risk as well as wider benefits, further comments provided in reference to Appendix B.	Noted with thanks	Enhanced reference to soil's ability to have wider environmental benefits when used as a nature-based solution to combat flooding. 'Implications for the LFRMS' Page A11. Updates to SEA Framework made.
	Climatic Factors (page A12) Does not currently address climate change adequately, in relation to flood risk and other climate risk hazards, further comments provided in reference to Appendix B.	Noted with thanks	Elaboration on how the LFRMS should seek to adapt Carmarthenshire to climate change provided in 'Implications for the LFRMS', Page A14. Updates to SEA Framework made.

Reference	Consultation Comment	Arcadis Response	Action
Appendix B – 1 Biodiversity, Flora and Fauna	Needs **more focus on potential links to manage flood risk and draft LFRMS**.	Noted with thanks	The below comments have been considered and included to link back to flooding and the LFRMS. New additions to Appendix B have also been included in the SEA Framework and summary tables in the SEA Scoping Report and Main Report.
	Doesn't mention the links between Natural Flood **Management and Sustainable land management, which should be considered** given LFRMS Measure 6 – 'develop a catchment-based approach to FCERM'. For example, saltmarsh restoration, peatland restoration, floodplain reconnection, soil and land management or GBI. This also links to evidence in https://www.carmarthenshire.gov.wales/council-services/planning/biodiversity/the-state-of-nature-in-carmarthenshire/	Noted with thanks	Key opportunity added in 'natural flood management' and 'sustainable land management for the enhancement of biodiversity' in Appendix B and the main report. The utilisation of nature-based solutions has also been added to the SEA Framework.
	There is **no mention of the importance of grassland habitats**, or specifically the 25 sites managed as part of Carmarthenshire's https://www.carmarthenshire.gov.wales/council-services/planning/biodiversity/marsh-fritillary-project/	Noted with thanks	Grassland habitats and their importance included in App B Section 1.2, with reference to Marsh Fritillary Butterflies.
	1.1.4 – Reference to 92 SSSIs and 15,300 ha does not align with the Carmarthenshire LNP SoNNaR which cites 15,300 ha of protected sites including 89 SSSI, 8 SAC, 5 NNR, 3 SPA and 1 Ramsar.	Noted with thanks	Changed the amount of SSSIs and SACs to those recommended and mentioned on Protected sites - Carmarthenshire County Council. However, the reference to 15,300 ha has been retained due to being recognised on the recently updated above link. Referencing changed accordingly.

Reference	Consultation Comment	Arcadis Response	Action
			These updates apply to Section 1: Biodiversity in App B.
	Update reference to: https://www.carmarthenshire.gov.wales/council-services/planning/biodiversity/carmarthenshire-nature-partnership/ in 1.4, and key point from LNRP is the need to look beyond designated sites – to priority habitats which are isolated and non-designated. Opportunities for improving ecosystem resilience is not solely related to nationally protected sites, and this **should be explored further**. **Suggest include reference to locally designated sites** - 6 local nature reserves, SINCs and non-designated sites which are section 7 habitats, as well as other key themes from the LNRP.	Noted with thanks, issue with Carmarthenshire SINCs	Reference is updated in 1.4, with mention of how the LNRP (Local Nature Recovery Plan) is focused on enhancing biodiversity beyond designated sites. This update is also included in the SEA Framework. Included overview of Local Nature Reserves, though information on SINCs within Carmarthenshire was unavailable. An overview of what they are and how the term is defined has been included. Added as a data gap. Further exploration of opportunities to improve biodiversity included in section 1.4.
	Reference the below due to the opportunity highlighted for RENs, and how that links to the draft LFRMS. https://naturalresources.wales/guidance-and-advice/environmental-topics/land-management/practitioners-guide-to-resilient-ecological-networks/?lang=en https://datamap.gov.wales/layergroups/geonode:nrw_priority_ecological_networks	Noted with thanks	Reference added for RENs (Resilient Ecological Networks), expanded overview and linked to flooding. Reference to RENs also included in the SEA Framework.

Reference	Consultation Comment	Arcadis Response	Action
	We recommend **including reference to the risk of Non-native invasive species alongside watercourses and their spread**, the potential for such plants to impede flow especially on smaller watercourses and the benefits for their management.	Noted with thanks	Non-native invasive species mentioned in section 1.4, with link to flooding and ecology. Reference to this also included in the SEA Framework.
	Opportunities exist beyond the implementation of the Local Nature Recovery Action Plan (LNRAP). For example flood risk management incorporating nature based solutions will increase resilience of habitats and species to the adverse impacts of climate change as well as addressing flood risk.	Noted with thanks	Nature based solutions to flooding included in section 1.4 and the SEA Framework.
	Reference should be made to the Carmarthenshire LNP State of Nature Report which outlines climate change and ecosystem resilience issues specific to Carmarthenshire's biodiversity assets. https://www.wwbic.org.uk/wp-content/uploads/2024/09/Carms-SoN-summary-doc-ENG.pdf	Noted with thanks	References to information in the State of Nature Report made in sections 1.1.2 and 1.4.
	https://www.carmarthenshire.gov.wales/media/hcrh4gap/green-and-blue-infrastructure-assessment-2023.pdf **should be referred to**. This flags the importance of development proposals maximising opportunities to integrate multifunctional GBI to deliver combined objectives which benefit biodiversity, climate change and sustainability, health and wellbeing, sense of place and economy. It refers to the CCC Nature Recovery Plan, and specifically its recommendation that "public bodies must prioritise planning for Green and Blue Infrastructure that will both help to create Resilient Ecological Networks, and benefitting people, putting sustainable development that invests in nature at the heart of local decision-making."	Noted with thanks	Reference to the technical report included in section 1.4 of App B. The importance of prioritising GBI has been incorporated into the SEA Framework.
	Inclusion of information if any of the protected sites are at risk of flooding or coastal erosion. This information is available from the draft LFRMS.	Noted with thanks	Included information of the designated sites with high-risk flooding receptors to emphasise flooding as a key pressure to Carmarthenshire's biodiversity in section 1.4.

Reference	Consultation Comment	Arcadis Response	Action
	Areas of Welsh Government Woodland Estate within the CCC area should also be considered. A forest resource plan is a core management document used on the Welsh Government's Woodland Estate (WGWE). It lays out proposals for the future management of a woodland in accordance with current policy and practice Forest Resource Plans. The areas within CCC boundaries are: https://naturalresources.wales/about-us/what-we-do/strategies-plans-and-policies/forest-resource-plans/pembrey-forest-resource-plan/?lang=en https://naturalresources.wales/about-us/what-we-do/strategies-plans-and-policies/forest-resource-plans/crychan-forest-resource-plan/?lang=en Future iterations of the Forest Resource Plans will be put together to meet the standards set out in the UKFS and UKWAS for water management and flood risk. Particular attention to the UKFS Practice Guide on Designing Forests and Woodland to reduce flood risk https://cdn.forestresearch.gov.uk/2022/10/UKFSPG027.pdf	Noted with thanks	Reference to Forest Resource Plans and future dedication to flood risk included in section 1.4 and the SEA Framework.
Appendix B – 2 Population	**More detail is needed at the CCC scale, with explicit consideration for flood risk and the draft LFRMS for the below:**	Noted with thanks	Where information was available, this section has been updated to emphasise Carmarthenshire and the LFRMS as the below comments were actioned. This is also reflected in the SEA Framework.
	How many people and residential properties at risk of flooding?	Noted with thanks	Addition of communities recognised at risk of flooding, alongside residential properties identified to be at risk of flooding in section 2.1.1
	How many business properties at risk of flooding for the change?	Noted with thanks	Unable to find specific information for how many businesses are at

Reference	Consultation Comment	Arcadis Response	Action
			risk of flooding. Included as a data gap.
	What key infrastructure (public transport hubs/networks, hospitals, schools, utilities, active travel routes, Wales Coast Path etc) are at risk of flooding?	Noted with thanks	Included specific roads at risk of flooding, with reference to residential, built up areas presenting a high risk of flooding in section 2.3. Also included reference to Ammanford's Flood Risk Management Scheme in section 2.3. The protection of key urban flood risk receptors and infrastructure is now reflected in the SEA Framework.
	Consideration of the amount of urban/rural areas at flood risk within CCC. For instance, a sparsely populated rural and semirural area will face different challenges with flood risk, compared to a densely populated urban area.	Noted with thanks	Reference made to densely populated/ built up areas of Carmarthenshire being at a high risk of flooding due to the infrastructure in section 2.3, this is also reflected in the SEA Framework.
	Consideration of CCC's land, assets and consideration for flood risk and coastal erosion in the present day and considering climate change.	Noted with thanks	Included a consideration of flood risk and coastal erosion into the future in section 2.3.
	How is this population information and those at risk of flooding and coastal erosion expected to change with climate change?	Noted with thanks	Tied how the risk of flooding is expected to increase due to climate change with the increase of housing at risk of flooding and population increase together in

Reference	Consultation Comment	Arcadis Response	Action
			section 2.3. This is also reflected in the SEA Framework.
	How does the population information inform/influence the LFRMS measures? e.g. to “Educate, advise, and empower our communities to become more resilient”. For example, inclusion of languages spoken with CCC to understand how to increase awareness and communicate risk. Or for the ageing population and what that would mean for resilience after flooding, considering mobility, access etc, as well understanding flood warning messages (as mentioned in Human Health). The majority of the above is available within the draft LFRMS as the Strategic Flood Risk, https://statswales.gov.wales/Catalogue/Environment-and-Countryside/Flooding/propertiesatriskoffflooding2024 or refer to https://flood-map-for-planning.naturalresources.wales/	Noted	This seems to be an analysis which can be reflected in the assessment section of the SEA, not baseline information.
	Query data listed as data gap, as population figures are provided in Figure B-2 and projection figures are available at https://statswales.gov.wales/Catalogue/Population-and-Migration/Population/Projections/Local-Authority/2018-based/populationprojections-by-localauthority-year **More detail about what is considered a gap or limitation should be included**	Noted with thanks	Data gaps for demographic data and population projections removed.
Appendix B – 3 Human Health	**It is our view that further consideration is needed to the below evidence sources and the section be updated accordingly:**	Noted with thanks	Further consideration has been given to the recommendations with Section 3 and the SEA Framework updated accordingly.
	CCC **PSB’s Wellbeing Assessment and Plan:** https://www.thecarmarthenshirewewant.wales/ and https://www.thecarmarthenshirewewant.wales/media/x3fhtenc/well-being-plan.pdf	Noted with thanks	Well-being plan referenced and linked to opportunities to improve health and flood risk in Section 3.3. This is also reflected in the SEA Framework.

Reference	Consultation Comment	Arcadis Response	Action
	CCC's **Green and Blue Infrastructure Assessment** should be referenced here and within the opportunities – e.g. creation of rain gardens and creating blue and green spaces having multiple benefits. https://www.carmarthenshire.gov.wales/media/hcrh4gap/green-and-blue-infrastructure-assessment-2023.pdf	Noted with thanks	GBI assessment technical report mentioned in section 3.3 with implications for community well-being and flood management. This is also reflected in the SEA Framework.
	Britich Red Cross Research: **Every time it rains** https://www.redcross.org.uk/about-us/what-we-do/we-speak-up-for-change/every-time-it-rains-british-red-cross-report-on-flooding and **Vulnerability and Resilience: Public awareness and perceprtions of flood risk in the UK** https://www.redcross.org.uk/-/media/documents-indexed/public-awareness-and-perceptions-of-flood-risk-in-the-uk.pdf?sc_lang=en&hash=4CAB6146C004EB6178D2FF4649D00D1B	Noted with thanks	Referenced the study in section 3.3 and also noted in the relevant section of App A. The facilitation of the improvements to policy and practice to bolster flood resilience is reflected in the SEA Framework.
	Joseph Rowntree Foundation Present and Future flood vulnerability risk and disadvantage 2017 http://www.sayersandpartners.co.uk/uploads/6/2/0/9/6209349/sayers_2017_-_present_and_future_flood_vulnerability_risk_and_disadvantage_-_final_report_-_uploaded_05june2017_printed_-_high_quality.pdf which highlights the social vulnerability of those at flood risk.	Noted with thanks	Sentence added in Section 3.1.5 to highlight the link between flooding and deprivation.
	PHW's Climate Change in Wales; Health Impact Assessment, and be updated accordingly https://phwwhocc.co.uk/resources/climate-change-in-wales-health-impact-assessment/	Noted with thanks	This document has been included and outlined in Section 3.1.1.
	We would also **highlight the potential work of the Carmarthen PSB to complete a Climate Risk Assessment Report**, as an opportunity to join up and build local knowledge about the lived experiences of flooding, as well as the PSB's Well-being Plan.	Noted	This work will be included, as and when it is available.
	How do those at-risk correlate with those in the highest density areas, the Wales Index of Multiple Deprivation, access to green spaces etc. Given evidence that those in	Noted	App B has outlined the baseline of Carmarthenshire, the analysis of

Reference	Consultation Comment	Arcadis Response	Action
	the most deprived areas are more likely to be vulnerable to climate risks of flooding, drought, heatwaves, and have a reduced capacity to cope/recover.		this information will be in another section of the SEA.
	The opportunity to deliver nature-based solutions and green infrastructure should be considered, for the reduction of flood risk, as well as the multiple benefits they can offer including access to green and blue spaces and the potential to improve physical and mental health.	Noted with thanks	This is now included in section 3.3 and reflected in the SEA Framework.
	Data relating to the link between deprivation and flood risk is given as a data gap, but **WIMD data is available and could be compared to the available flood risk data for present day,** and also including climate change allowances, as well as key evidence sources provided.	Noted with thanks	Data Gap removed.
Appendix B – 4 Soil	**The below key areas have not been considered:**		
	Coal tips within Carmarthenshire and the interlinked risk with flood risk and climate change https://www.gov.wales/coal-tip-safety For the present day and considering climate change – refer to Mining Remediation Authority https://www.gov.uk/government/news/new-era-as-coal-authority-becomes-mining-remediation-authority The Colliery spoil biodiversity initiative should also be noted, with key links to biodiversity, cultural heritage, and landscape https://www.collieryspoil.com/	Noted with thanks	Baseline of Carmarthenshire coal tips added in section 4.1.4, and key risk/opportunity for the LFRMS mentioned in section 4.3. This is also reflected in the SEA Framework.
	Peatland as baseline information or peatland restoration as a climate change mitigation opportunity.	Noted with thanks	Reference made to the Carmarthenshire Bogs project and opportunities to mitigate climate change and flooding through bog and peatland restoration in Section 4.3. This is reflected in the SEA Framework.

Reference	Consultation Comment	Arcadis Response	Action
	This link https://smnr-nrw.hub.arcgis.com/apps/d18ef8c74ecc4dc4a0cbf71ab6935ba0/explore contains the new peat map showing the locations of all Peatlands in Wales.	Noted with thanks	Link reviewed and included as a footnote in Section 4.1.5 alongside peatland baseline information.
	The National Peatland Action Programme (NPAP) is a 5-year plan (2020-2025) of peatland restoration in Wales. Welsh peatlands need urgent action to reverse habitat loss and their poor condition. They support a variety of habitats and species, and have an important role in: - Capturing and storing carbon - regulating greenhouse gases - maintaining biodiversity - regulating water To determine any opportunities project managers should contact the NPAP team npap@naturalresourceswales.gov.uk	Noted with thanks	Referenced the programme in section 4.3 and tied it to flood risk and Carmarthenshire. Peatland restoration is now included in the SEA Framework.
	There is an opportunity for nature-based solutions to reduce soil erosion, as well as flood risk, and provide wider benefits such as reducing water pollution and increasing resilience during droughts. For instance, land management practices, reconnecting watercourses to the floodplains to slow the flow. Sustainable and regenerative agricultural land management within catchment areas has an important part to play in reducing soil surface run-off and erosion associated with degraded soil structure from intensive practices: https://smnr-nrw.hub.arcgis.com/apps/036c04ccb85948d2abe7312de75ad318/explore	Noted with thanks	Included key opportunities for nature-based solutions in relation to flooding and soil management, with the inclusion of resilience to drought in Section 4.3. This is reflected in the SEA Framework.
	References to predictive agricultural soil classification maps (https://datamap.gov.wales/layers/inspire-wg:wg_predictive_alc2) and consideration should also be given to the Sustainable Farming Scheme https://www.gov.wales/sustainable-farming-scheme-guide	Noted with thanks	Sustainable farming scheme referenced and seen as an opportunity for flood and soil management in Carmarthenshire in Section 4.3. The enhancement of agricultural land management is

Reference	Consultation Comment	Arcadis Response	Action
			now included in the SEA Framework.
	Reference to: https://www.carmarthenshire.gov.wales/home/council-services/planning/new-phosphates-targets/what-action-have-we-taken/	Noted with thanks	Phosphates targets and water quality have been referenced to in Section 5 – water.
	Identify if there is any contaminated land with CCC at risk of flooding or coastal erosion.	Noted with thanks	Have not been able to identify this, listed as a data gap in Section 4.2.
	It would be beneficial for **the section to be reconsidered, in terms of how the LFRMS can support this approach and offer an opportunity for both ecosystem benefit and flood risk benefit**.	Noted with thanks	Expanded Section 4.3 to better reflect how consideration of soils and landscape can enhance flood management and ecosystem benefit in the LFRMS.
	Query around this "A key opportunity for the strengthening of flood defences in vulnerable low-lying coastal areas, such as permeable surfaces and encouraging run-off." as SUDS isn't just for low-lying coastal areas.	Noted with thanks	Statement generalised to Carmarthenshire with reference to SuDS in Section 4.3.
Appendix B – 5 Water	**Reference to Brecon Beacons National Park** should be updated to Bannau Brycheiniog National Park.	Noted with thanks	References amended.
	5.1.1 70% of the county's coastline, should be updated to 70% of the District's coastline (referring to the Western Wales RBD).	Noted with thanks	Amendment made.
	Data provided (including, Table B-5 and Figure B-15) **needs to be updated** as currently using older evidence sources. The current data is the Cycle 3 baseline classification, released in 2021, and a Cycle 3 Interim (mid-cycle) classification is about to be published (late January/early February). The Carmarthen Bay and Gower Management Catchment Summary (MCS) was a supporting document to Cycle 1 and Cycle 2 of WFD, and is no longer updated, and Figure B-15 refers to a graphic from the	Noted	In the Cycle 3 data, only information relating to Wales as a whole appears to be available. No amendment made at this time.

Reference	Consultation Comment	Arcadis Response	Action
	2013 MCS. Therefore, the updated data from Cycle 3 should be provided, for just Carmarthenshire.		
	5.1.3 Updating Bathing Water Report is available at https://naturalresources.wales/media/gf1jyjdw/wales-bathing-water-report-2024.pdf . There are 2 Bathing Waters within Carmarthenshire (Pembrey and Pendine), Amroth Central is within Pembrokeshire so reference should be removed.	Noted with thanks	Removed Amroth Central.
	5.1.8 refers to NRW's https://naturalresources.wales/evidence-and-data/research-and-reports/flooding-reports-evidence-and-data/flood-risk-management-annual-report-2023-2024/?lang=en , and it should be made clearer that the activities listed relate to NRW. For example, the £56.6m referenced was received by NRW. WG also fund other RMAs https://www.gov.wales/flood-and-coastal-erosion-risk-management-programme-2023-2024-html#:~:text=Each%20financial%20year%20the%20Welsh,erosion%20to%20communities%20across%20Wales.	Noted with thanks	Emphasised how the activities listed in 5.1.9 relate to NRW.
	Section to refer to the below and be updated accordingly;		
	Reference to assessment of water quality in SAC rivers: - Compliance assessment of Welsh sacs against phosphorous targets: https://cdn.cyfoethnaturiol.cymru/media/693025/compliance-assessment-of-welsh-sacs-against-phosphorus-targets-final-v10.pdf?mode=pad&rnd=132557227300000000 - NRW update to phosphorous targets for water bodies in SAC rivers: https://naturalresources.wales/evidence-and-data/research-and-reports/water-reports/update-to-phosphorus-targets-for-water-bodies-in-special-area-of-conservation-sac-rivers-in-wales/?lang=en - NRW assessment of water quality in protected rivers: https://naturalresourceswales.gov.uk/evidence-and-data/research-and-reports/water-reports/assessment-of-water-quality-in-protected-rivers-in-wales/?lang=en	Noted with thanks	Included reference to assessment of water quality in SAC rivers in Section 5.1.4. Also included reference to Phosphorous targets and SAC rivers affected in Carmarthenshire in the same section. A key opportunity arising from this presented in section 5.3. The protection of water quality in SAC rivers and the predicted increase in flood risk included in the SEA Framework.

Reference	Consultation Comment	Arcadis Response	Action
	The 4 Rivers for LIFE project aims to improve the conservation of four SAC rivers in Wales including the River Teifi by rehabilitating and restoring their natural processes, features and physical habitats.	Noted with thanks	Added as a key opportunity in section 5.3. The improved conservation of SAC rivers is included in the SEA Framework.
	The Teifi Demonstrator https://naturalresources.wales/about-us/news-and-blogs/blogs/tackling-the-teifi-landowners-industries-and-regulators-join-forces-for-pilot-demonstrator-catchment-project/?lang=en aims to collaborate with others on a project to tackle water quality issues on the Afon Teifi. It will complement and support the good work already happening in the catchment, building on existing ambitious river restoration projects like our Four Rivers for LIFE project and the work of the Teifi Nutrient Management Board.	Noted with thanks	Some additional information on the River Teifi added to Appendix B.
	A LFRMS has the opportunity to be detrimental or beneficial to implementing WFD mitigation measures. FRM activities do contribute to WFD failures due to physical modifications so there should be an issue/opportunity for the LFRMS to make efforts address this. Opportunities to work collaboratively on nature based solutions for wider benefits, including flood risk, should be listed as an opportunity. All projects being undertaken in the fluvial, estuarine or coastal environment must undergo WFD compliance assessment. This should be considered and referenced, please refer to https://naturalresources.wales/media/684784/20171122-final-signed-revised-wfd-advice-note-for-local-authorities.pdf	Noted with thanks	Included in section 5.3 the possibility of Flood Risk Management (FRM) activities contributing to Water Framework Directive (WFD) failures. Have also included the opportunity to work collaboratively in the LFRMS. This is now reflected in the SEA Framework. Section 5.1.7 now includes reference to the WFD compliance assessment.
	There should be specific mention of **Geomorphology/Hydromorphology** - protections and restoration of geomorphology is essential to building or resilience of ecosystems. Given the significant urban pressures geomorphology consideration is essential for climate and ecosystem resilience.	Noted with thanks	Referenced to physical modifications in section 5.3 and how it can adversely affect the environment. Tied in with collaborative efforts of the LFRMS to mitigate negative environmental

Reference	Consultation Comment	Arcadis Response	Action
	One of the primary Reasons for failure of waterbodies under WFD in Wales is the physical modification of watercourses and the disconnection with their floodplains and riparian corridors. Physical modifications are not just about fish passage, but is a core element to the function of watercourses alongside water quality and quantity. Without restoration of geomorphology habitats for fish and invertebrates cannot be sustained or present or can lead to increased erosion and deposition which can impact flooding and water quality. This is not considered at any point in the SEA. There is a summary in the https://www.gov.uk/guidance/river-basin-management-plans-updated-2022-summary-programmes-of-measures-mechanisms/8-physical-modifications-and-morphology		impacts of future modifications. The need to mitigate the effects of physical modifications to waterbodies is now reflected in the SEA Framework.
	Heavily Modified Waterbodies (HMWB) in CCC should be included in the baseline information. Some waterbodies might be classified as a HMWB as a result of their function as a flood risk asset. These might provide valuable social and economic benefits which it is vitally important to protect, so they have been designated as such under Article 4.3 of the WFD. There can still be opportunities to deliver mitigation measures in HMWB to help achieve Good Ecological Potential. Where FRMP measures are delivered in a HMWB, they must seek opportunities to deliver mitigation measures identified for the HMWB.	Noted with thanks	Identified as a data gap.
	Opportunity Catchments (OpC) have been agreed as the delivery mechanism for the third cycle River Basin Management Plans (RBMP) (2021-2027). The focus of OpC is to maximise multiple benefits for waterbodies, health and wellbeing, delivered through partnership working. OpC are a delivery mechanism to	Noted with thanks	Opportunity Catchments and Area Statements mentioned in section 5.3 with reference to how collaboration could offer opportunities for the LFRMS. This

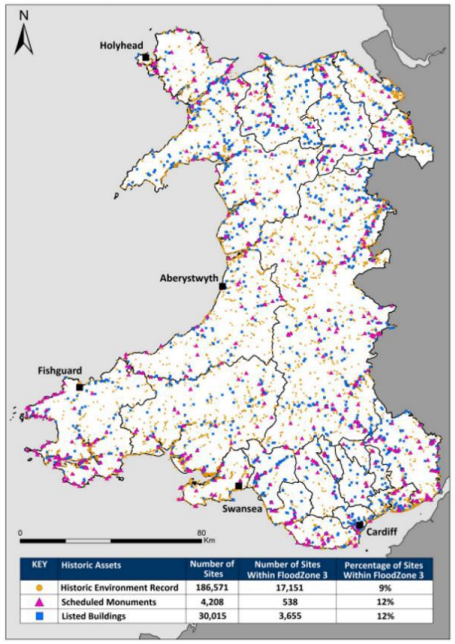
Reference	Consultation Comment	Arcadis Response	Action
	integrate RBMP with other work streams and to deliver the Natural Resources Plan priorities, such as delivery through nature-based solutions. Area Statements provide an important local steer having identified the local challenges and opportunities for each area. The principal theme for the Afon Teifi Opportunity Catchment is to work collaboratively with others to improve the management of land and water quality.		is now also reflected in the SEA Framework.
	There is currently limited mention of Water Resources and water abstraction licences within the current draft. The Water Act is the Legislation that drives the management of our water resources. Inclusion of other relevant plans and policies, such as Abstraction Licensing Strategies (ALS), this strategy assesses applications to abstract and/or impound water against local water availability. Please refer to the Carmarthen Bay Abstraction Licensing Strategy Further consideration of water quantity suggested (Abstraction Strategy and drought), and how nature based solutions may offer wider benefits (e.g. pond creation can help to slow the flow, but also provide an alternative water source for wildlife during drought).	Noted with thanks	Included reference to the Water Act in section 5.1.6. Referred to the Carmarthen Bay Abstraction licensing policy in Section 5.1.6. Nature based solutions and how they can offer a wide range of environmental benefits is included in section 5.3. This is also reflected in the SEA Framework.
	Reference should be made to the Shoreline Management Plan and associated policy units, and consider any ecological habitats that coastal squeeze may impact (e.g. saltmarsh).	Noted with thanks	Shoreline Management Plan mentioned in section 1 – Biodiversity and linked to coastal squeeze and the LFRMS.
	Would suggest rephrasing of 5.1.5. NRW's rainfall, river level and sea data is available but relates to NRW's remit for main rivers and the sea. Given that CCC's LFRMS focuses on local flood risk, would be more appropriate to draw on the draft LFRMS and note the plans for telemetered stations. There is also limited value in comparing river levels against each other, rather than the peak history at the same site (this data is available).	Noted with thanks.	Included more detail of the 49 communities at the greatest risk of flooding. Comparison won't be in App B. Included how FCERM (Flood and Coastal Erosion Risk

Reference	Consultation Comment	Arcadis Response	Action
	More detail of the 49 communities is needed. Details from the draft LFRMS should be included, and compared against other evidence and data from Population and Human Health. Communities at risk from flooding of main rivers and the sea in Carmarthenshire are included in NRW's South West Wales FRMP, or details from the Communities at Risk Register could also be included. Would be appropriate to refer to Welsh Government's https://www.gov.wales/national-strategy-flood-and-coastal-erosion-risk-management-wales for an explanation of flood risk roles and responsibilities. CCC also have a role as highways authority and as Sustainable Drainage Approval Body (SAB).		Management) is managed in Wales with a mention to CCC being a SAB, also referenced the advised document. Could not find a mention of 'telemetered' stations in the draft LFRMS. All updates are within 5.1.5 and 5.1.6
	Would challenge the point "The current investment in flood risk infrastructure is producing resilience to withstand future risks." Flood defences alone will not provide resilience to flooding, for either present day or future flood risk, although they are an important part of the picture. Reference https://naturalresources.wales/evidence-and-data/research-and-reports/flooding-reports-evidence-and-data/long-term-investment-requirements-for-flood-defences-in-wales/?lang=en	Noted with thanks	Updated point in section 5.3, included reference to other flood management techniques and expanded upon this point regarding future risks.
	Phosphates should be included in the key issues	Noted with thanks	Phosphates included in section 5.3 and the SEA Framework.
	The Carmarthenshire Interim Action Plan for Nutrient Neutrality (chapter 4 of https://www.carmarthenshire.gov.wales/media/gjdja55l/topic-paper-phosphorus-oct-2023.pdf) presents the opportunity for design of new developments in catchments of the Afon Teifi, Afon Tywi, Afonydd Cleddau, River Wye and River Usk to integrate SUDS and Nature based Solutions (such as tree planting, wetlands creation and riparian buffer zones). Such solutions can also offer other benefits for biodiversity and flood alleviation.	Noted with thanks	Included in section 5.3 and the SEA Framework
	Sustainable travel, sites of high amenity value and accessible green and blue spaces has not yet been considered.	Noted with thanks	Accessible blue space in the form of bathing waters mentioned in this section. Green space

Reference	Consultation Comment	Arcadis Response	Action
			accessibility mentioned in App B – Health.
Appendix B – 6 Air	Any flood alleviation plans that could impact traffic routes would need to consult the Local Authority Air Quality Management Plans to ensure that changes in traffic flows do not increase air quality issues. An update is available on the https://law.gov.wales/environment-air-quality-and-soundscapes-wales-act-2024 that will introduce new air quality targets within Wales.	Noted with thanks	This is a comment for the plan making team – no action.
Appendix B – 7 Climatic Factors	**The section is currently too focused on achieving net zero and energy use in CCC**, rather than considering what the changing climate would mean for the flood risk and how the LFRMS could address this.	Noted with thanks	Further key opportunities have been listed in Section 7.5 with further detail on Carmarthenshire in section 7.3.6 as suggested. Updates to the Key Issues and Opportunities section are reflected in the SEA Framework.
	Should refer to CCC declaring a climate emergency in February 2019, and commitment to becoming a net zero https://www.carmarthenshire.gov.wales/media/1223704/gd6245-netzerocarbon-plan3.pdf	Noted with thanks	Included this in Section 7.1.3.
	Should refer to the Met Office's https://climatedataportal.metoffice.gov.uk/pages/lacs and the UK CCRA3 Summary for Wales in relation to the flood risks (e.g. rainfall patterns, temperature, projected sea level rise) as well as the interaction with other climate change risks (heatwaves, wildfire, drought).	Noted with thanks	Included reference to the UK CCRA3 (Climate Change Risk Assessment) Summary for Wales in relation to the flood risks and interactions with other climate change risks in section 7.3.6.
	Should include numbers of properties at risk including climate change allowances https://statswales.gov.wales/Catalogue/Environment-and-	Noted with thanks	Included number of properties at risk of flooding in Carmarthenshire

Reference	Consultation Comment	Arcadis Response	Action
	Countryside/Flooding/propertiesatriskoffflooding2024 or refer to https://flood-map-for-planning.naturalresources.wales/		with suggested reference in Section 7.3.6.
	Should refer to CCC's GBI assessment, GBI can have a role in increasing climate resilience in urban areas by increasing surface area of green cover, increasing water retention capacity of the environment, which can mitigate against both droughts and flooding, as well as wider benefits.	Noted with thanks	Included reference to the GBI assessment and mentioned how GBI can be seen as an opportunity for the LFRMS in Section 7.5. This is now reflected in the SEA Framework.
	Should refer to the Shoreline Management Plan and associated policy units, to consider changes at the coast and coastal communities, as well as coastal squeeze and the impact of coastal squeeze on the Marine Protected Area (MPA) network.	Noted with thanks	The Shoreline Management Plan and the impacts of Coastal squeeze on MPAs is outlined in Section 1 Biodiversity.
	Should refer to nature-based solutions for managing flood risk that may also have carbon capture (e.g. saltmarsh creation and peatland restoration).	Noted with thanks	Reference to nature-based solutions included in Section 7.5. This is now reflected in the SEA Framework.
	In relation to any opportunities to harness renewable energy from water, **any proposal to make use of our water resources should consider regulatory requirements**. Abstraction and impounding activities may be subject to permits, that take into account the needs of the water environment and other water users. You can find more information here: https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fnaturalresourceswales.gov.uk%2Fpermits-and-permissions%2Fwater-abstraction-and-impoundment%2Ffind-out-if-you-need-a-water-abstraction-or-impoundment-licence%2F%3Flang%3Den&data=05%7C02%7Channah.davies%40cyfoethnaturiolcymru.gov.uk%7C1ead30cb91bf41778e9308dd30a65b95%7C8865ef0facde487cbf175cb50375d757%7C0%7C0%7C638720213229400589%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiOiJXaW4zMiIsIkFOIjoiTWF	Noted with thanks	Have not included, as the renewable energy point in 7.5 is outlining the opportunity for the use of this, which is still an opportunity even though it is subject to regulatory requirements, and it is not seen as a risk. Water abstraction licenses are referred to in Section 6 – Water.

Reference	Consultation Comment	Arcadis Response	Action
	pbCIsIldUIjoyfQ%3D%3D%7C0%7C%7C%7C&sdata=VDwngtwuaKYKYeaqFDoihRIcD%2FUcKcQHBWwr4FFFFX8%3D&reserved=0 For example, a new hydropower scheme may require licences for both abstraction from, and impoundment of, the watercourse.		
Appendix B – 8 Cultural Heritage and Archaeology	**Further exploration is needed to consider if there are any of the listed buildings, scheduled monuments at risk of flooding in the present day, and with projected climate change**. Inclusion of figures or maps to highlight this would be beneficial.	Noted	Specific heritage assets at risk of flooding in Carmarthenshire listed as a data gap.
	8.7 - Data is available at the national level around climate change impacts on cultural heritage, so it could be noted that the data gap is at CCC scale. See: - https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Briefing-Cultural-Heritage.pdf which outlines climate change issues for cultural heritage. - https://cadw.gov.wales/sites/default/files/2020-02/A%20strategic%20approach%20for%20assessing%20and%20addressing%20the%20potential%20impacts%20of%20climate%20change%20on%20the%20historic%20environment_EN_CY.pdf which includes risk assessment methodology for historic assets assessed as being at significant risk from rising sea levels. - **Historic Environment and Climate Change Sector Adaptation Plan** https://cadw.gov.wales/sites/default/files/2020-02/Adaptation%20Plan%20-%20FINAL%20WEB%20-%20English%20%281%29.pdf	Noted with thanks	Included acclimate change impacts on cultural heritage as a data gap. Included reference to the Historic Environment Group as a key opportunity for the protection of heritage assets in Carmarthenshire from environmental threats. This is now reflected in the SEA Framework.

Reference	Consultation Comment	Arcadis Response	Action
	Figure 2: Identification of historic assets in Flood Zone 3. These have a 100 to 1 chance of future flooding from rivers or a 200 to 1 chance of flooding from the sea.  KEY | Historic Assets | Number of Sites | Number of Sites Within FloodZone 3 | Percentage of Sites Within FloodZone 3 Historic Environment Record | 186,571 | 17,151 | 9% Scheduled Monuments | 4,208 | 538 | 12% Listed Buildings | 30,015 | 3,655 | 12% In Wales, a spatial mapping project has identified the number of historic assets that could be at risk from climate change, an example of which is shown in Figure 2. Led by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW), the methodology for the project draws upon a number of dynamic spatial data sets, including LiDAR, flood risk data and intertidal data. Further work to develop clearer identification and understanding of the threats, alongside an improved evidence base, will allow us to adapt and prioritise our efforts.		
	8.8 - the issue/opportunity to commission local refinement to Carmarthenshire scale of the Wales wide RCAHMW spatial mapping could be included, to inform key areas of risk which to be addressed by LFRMS measures and actions.	Noted with thanks	Included reference to and foreseeable opportunity for the local refinement of this spatial mapping service in Section 8.8.

Reference	Consultation Comment	Arcadis Response	Action
			This is now included in the SEA Framework.
Appendix B – 9 Landscape	**9.1.3** Reference to Brecon Beacons National Park should be updated to Bannau Brycheiniog National Park.	Noted with thanks	Changed the name in Section 9.1.3.
	9.2 Focusing on the CCC scale would be more beneficial**.**	Noted with thanks	Introductory section reworded.
	Welcome reference to https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/landmap-the-welsh-landscape-baseline/?lang=en Tranquillity and Dark Skies. Further exploration of the below points would be beneficial, especially how they may be issues or opportunities in relation to the LFRMS: - Conserve and enhance the landscape of the Bannau Brycheiniog National Park and it's setting, also the setting of the Gower National Landscape. - Maintain and enhance areas of tranquillity and dark skies - Protect and enhance landscape character and historic landscapes - Support resilient ecological networks at a landscape scale - Enable landscape adaptation to climate change - The importance of nature based solutions to flooding and in respect of climate change in the landscape and catchment context. This could be a good opportunity to highlight the multiple benefits of nature based solutions in flood risk management. For example, salt marsh in coastal environment.	Noted with thanks	Included key opportunities from the protection and maintenance of Bannau Brycheiniog National Park and remaining tranquil areas for enhancing climate resilience and reducing flood risk within the LFRMS in Section 9.7. Also mentioned nature-based solutions within this addition. This is now reflected in the SEA Framework.
	The Strategy sets out Key Flood Risk Receptors in tables which could be referenced within this section, some of the figures used require checking, especially numbers of Country Parks impacted.	Noted	It is unclear which strategy is being referred to in the comment. However, the figures mentioned in this section have been checked by double checking supporting footnotes.

Arcadis Consulting (UK) Limited

Suite 4D, Hodge House,

114 – 116 St Mary Street,

Cardiff,

CF10 1DY

United Kingdom

arcadis.com