



**Cyfoeth
Naturiol**
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**Natural
Resources**
Wales



**Environment
Agency**

Environmental Report

Draft Western Wales Flood Risk Management Plan

Rev No 1.0

October 2014

Our purpose is to ensure that the natural resources of Wales are sustainably maintained, used and enhanced, now and in the future

We will work for the communities of Wales to protect people and their homes as much as possible from environmental incidents like flooding and pollution. We will provide opportunities for them to learn, use and benefit from Wales' natural resources

We will work for Wales' economy and enable the sustainable use of natural resources to support jobs & enterprise. We will help businesses and developers to understand and consider environmental limits when they make important decisions.

We will work to maintain and improve the quality of the environment for everyone. We will work towards making the environment and natural resources more resilient to climate change and other pressures.

Non-Technical Summary

Flood risk management plans highlight the hazards and risks from rivers, the sea, surface water, groundwater and reservoirs and set out how risk management authorities will work together with communities to manage flood risk. They are required by the European Union Floods Directive and the Flood Risk Regulations 2009.

In this first cycle of implementing the regulations, Natural Resources Wales and the Environment Agency are required to prepare flood risk management plans for all of England and Wales covering flooding from main rivers, the sea and reservoirs. Lead local flood authorities must prepare flood risk management plans in flood risk areas. There are two in western wales RBD, the City and County of Swansea and Neath Port Talbot County Borough Council. The flood risk management plans must be reviewed and reissued every six years to describe progress.

The Western Wales flood risk management plan will be published in December 2015 and will cover the period 2015 to 2021. The draft plan is being consulted on between 10 October 2014 and 31 January 2015. It provides a description of the risk from flooding within the river basin district and outlines measures that are currently ongoing to manage flood risk, along with proposed new measures.

The Western Wales river basin district

The Western Wales River Basin District covers an area of 16,653 square kilometres. It extends across the entire western half of Wales, from the Vale of Glamorgan in the south to Denbighshire in the north.

The main centres of population are restricted to the coastal strip and the westernmost part of the South Wales valleys. The main urban centres are Swansea, Bridgend and Neath in the south, Aberystwyth in the centre on the coast and Bangor in the north. The river basin district is primarily rural, with land mainly used for agriculture and forestry. Thriving marine, oil and gas industries are critical economic activities, along with heavy industry such as the steel works at Port Talbot and commercial fisheries and tourism around the Welsh coastline.

Strategic environmental assessment

The draft Western Wales flood risk management plan has the potential to affect people and the environment. There is a legal requirement for this type of plan to be subject to a strategic environmental assessment (SEA) to determine these effects, recommend how to address them and to consider different ways of developing the plan.

Here is a summary of the likely effects of the plan on the wider environment, any mitigation required to manage the negative effects and opportunities to deliver environmental benefits:

The RBMP was assessed as having potential effects on the following ecosystem services:

Provisioning services

- **Food (e.g. crops, fruit, fish):** minor negative effect locally from potential agricultural land-take as a result of construction and /or realignment of defences. This must be considered against potential benefits where flood risk management measures protect agricultural land. There are potential negative effects on fisheries habitat caused by protection measures. However, all flood risk management schemes will need to comply with European regulations to allow fish and eel passage. Opportunities for schemes to improve fish habitats and passage, in line with RBMP recommendations, will be sought.

Regulating services

- **Water Regulation (e.g. flooding):** minor positive effect across the RBD that would be locally significant in the specific communities where actions will be implemented that will reduce the risk of flooding to people and property.
- **Soil and Erosion Regulation:** minor positive effect across the RBD as a result of reductions in the risk of extensive storm damage and erosion from flood events and also from changes to dredging and de-shoaling regimes.

Cultural services

- **Cultural Heritage:** minor negative effect from the potential for measures to disturb buried, unknown archaeology and the effect on known features of cultural heritage and landscapes. This is a precautionary assessment given the high degree of uncertainty as to the design of measures. To conserve and enhance the historic environment it will be important that individual schemes at the earliest stage identify

any designated or non-designated heritage assets, including the risk of unknown buried archaeology, in order to: establish the potential for adverse effects as well as opportunities for enhancement; determine whether any action should be taken due to the significance of the heritage assets and likely impacts; inform scheme options and detailed design; and identify an appropriate mitigation strategy. The effect also needs to be considered against the protection afforded to cultural heritage assets from ongoing, agreed and proposed measures.

- **Recreation and Tourism (including accessible blue and green space):** minor negative effect locally on recreation and tourism in the delivery of flood alleviation schemes due to potential loss of recreational or amenity land, disruption to public rights of way and changes in water levels that could affect water-based activities. This can be mitigated by involving relevant interests at an early stage at the project level to identify possible impacts and agree scheme specific mitigation. Opportunities for schemes to improve public access, interpretation and footpath and cycling networks, and enhance recreational and amenity land will be sought.
- **Aesthetic Value (e.g. landscape, seascape, tranquillity):** minor negative effect locally subject to the location, type and design of flood risk management schemes. The mitigation approach to potential negative impacts will include early consultation at the project level with relevant landscape interests and the undertaking, where necessary, of landscape and visual impact assessments to inform scheme design and mitigation.

Supporting services

- **Provision of Habitat:** minor negative effect. Ongoing and agreed measures being delivered under the draft second generation Shoreline Management Plan are supported by compensatory habitat delivery projects under the National Habitat Creation Programme. Proposed measures have the potential to have local effects subject to the location, type and design of flood risk management schemes. The mitigation approach for potential negative effects on habitats and species will involve early consultation with nature conservation interests to identify and assess at the project level any potential impacts (including designated sites of nature conservation interest and protected species) and agree scheme specific mitigation. Early engagement with nature conservation interests will enable opportunities to be

identified for habitat creation, improving habitat diversity and the condition and connectivity of sites, and for improving fish and eel passage and other habitats for protected species.

Overall, the draft Western Wales flood risk management plan is anticipated to have a positive effect on water regulation and erosion and soil regulation as it proposes measures to manage the flood risk to those communities and assets most at risk. Potential negative effects identified can be reduced at a project level through stakeholder engagement, good environmental design and the support of the National Habitat Creation Programme. Potential synergies and conflicts with the Western Wales RBMP have also been identified to inform implementation of the FRMP measures.

To determine if this is the case, Natural Resources Wales will monitor the effects the plan is having on the environment. The main mechanism will be through the river basin management plan which will report annually on various water quality aspects. Natural Resources Wales will also use readily-available and regularly collected information from existing sources to monitor change associated with the other predicted environmental effects. In this way, Natural Resources Wales will be able to determine whether any further action is necessary to manage the wider environmental effects of the Western Wales flood risk management plan.

This environmental report was published with the draft update to the Western Wales river basin management plan on 10 October 2014 and is available for consultation for a six month period. Consultation will close on 31 January 2015. We welcome your views and have set out some specific consultation questions below:

1. Do you agree with the conclusions of the environmental assessment? (yes / no)

a. If not, please explain why.

2. Are there any further significant environmental effects of the draft plan which you think should be covered by this assessment? (yes / no).

b. If yes, please describe what they are.

3. As part of the environmental report, we have set out mitigation measures for addressing any significant negative effects on the environment, as well as opportunities to deliver positive effects on the environment.

c. Are there further mitigation measures or opportunities for improving the environment that we should consider for the plan? (yes / no)

d. If yes, please give details.

How to respond

Natural Resources Wales would prefer you to respond to this consultation by email at:

Flood.risk.management.plan@naturalresourceswales.gov.uk

This will allow you to make your comments more effectively, while helping us to gather and summarise responses quickly and accurately. However, if you want to respond in another way, please contact the NRW customer contact centre on 0300 0653000.

Please return written responses by 31 January 2015 to:

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Contents

The Western Wales river basin district	3
Strategic environmental assessment.....	4
How to respond	7
1. Introduction	10
Draft flood risk management plans.....	10
Approach to Flood Risk Management in Natural Resources Wales	10
The Western Wales FRMP	11
Purpose of the environmental report	14
Finding your way through this report	15
2. Undertaking the assessment	18
The approach to the Strategic Environmental Assessment.....	18
Ecosystems services approach and SEA.....	19
Scope of the assessment	21
Assessing significance	24
Assessment method.....	24
Alternatives considered.....	25
Approach to developing the FRMP	25
Ongoing and agreed measures from existing plans	26
Proposed measures in the FRMP	26
Habitat regulation assessment	26
3. The environmental context for the plan.....	28
The Western Wales River Basin District.....	28
Review of relevant plans and policies within the Western Wales River Basin District ...	30
4. Significant effects of the Western Wales Flood Risk Management Plan.....	33
Overview of the effects of the updated Western Wales Flood Risk Management Plan ..	33
Significant effects of the Western Wales flood risk management plan	34
Soil formation	68
Nutrient cycling.....	68
Primary production	68
Water cycling.....	69
Western Wales River Basin Management Plan.....	71
5. Monitoring the effects of the plan	78
6. What happens now?	80
How to respond	80

Next steps..... 81
Annex A: Plans, policies and programmes reviewed for the SEA..... 82
Annex B: Scoping consultation responses summary 95

1. Introduction

The Environmental Report provides details of the outcome of the Strategic Environmental Assessment of the draft update to the Western Wales River Basin Management Plan (RBMP). The Strategic Environmental Assessment is used to take account of the likely effects on the wider environment when developing the plan.

Draft flood risk management plans

The European Floods Directive sets out requirements to manage flood risk from all sources in order to reduce the consequence of flooding on human health, economic activity and the environment. The Flood Risk Regulations 2009 transposed the European Floods Directive into law for England and Wales and there are four main stages to achieve the requirements of the regulations. Each of these stages is carried out in a six yearly cycle:

1. Prepare preliminary flood risk assessment report that details past floods and the possible consequences of future floods. This was completed in December 2011.
2. Identify flood risk areas where the risk from surface water flooding is significant. This was completed in December 2011.
3. Prepare flood hazard maps showing flood extent and velocity/depth and flood risk maps showing the consequences for flood risk areas. This was completed in December 2013.
4. Develop flood risk management plans (FRMPs). We are currently consulting on draft flood risk management plans.

Approach to Flood Risk Management in Natural Resources Wales

The National Flood and Coastal Risk Management Strategy sets the national framework for flood risk management in Wales. Natural Resources Wales (NRW) takes a risk based community approach to prioritise where best to direct investment. This is informed by the strategic framework provided by Catchment Flood Management Plans (CFMPs) and draft second generation Shoreline Management Plans (SMPs). The strategic framework set by these plans enable NRW to make short term decisions to manage present day risk whilst also considering the longer term projection of risk. The risk based community approach of present day risk assessment is done through NRW's Communities at Risk Register. This is

a tool that considers a number of factors to give an indication of where the most vulnerable communities at risk of flooding from main rivers and the sea are located across Wales. This is then used to inform, plan and prioritise our investment programme to target investment in the most at risk communities.

The FRMP objectives in Wales are:

1. Reduce the risk of harm to life from flooding to people and communities from main rivers, reservoirs and the sea.
2. Increase resilience of services, assets and infrastructure to the risk of flooding
3. Improve understanding of flood risk so that decisions are based upon the best available information.
4. Improve community awareness and resilience to flooding.
5. Provide an effective and sustained response to flood events.
6. Allocate funding and resources for all sources of flooding on a risk basis.
7. Incorporate the ecosystem approach into the delivery of flood risk management.

The Western Wales FRMP

The Western Wales flood risk management plan aims to deliver the 'National flood and coastal erosion risk management strategy for Wales, 2011' by setting out measures to manage flood risk from 2015 to 2021 and beyond. It brings existing flood risk management planning together, in particular drawing on information from catchment flood risk management plans (CFMPs), shoreline management plans (SMPs) and NRW's Communities at Risk Register.

By law, the Environment Agency and Natural Resources Wales must produce flood risk management plans for each **river basin district (RBD)**. These FRMPs must cover flooding from main rivers, the sea and reservoirs.

By law, Lead Local Flood Authorities (LLFAs) must produce FRMPs for all **flood risk areas** covering flooding from local sources, which includes surface water, ordinary watercourses and groundwater. All the LLFAs in Wales have made the commitment to produce separate FRMPs, rather than producing combined FRMPs. There are two LLFAs in the Western Wales RBD (City and County of Swansea and Neath Port Talbot County Borough Council) that have flood risk areas and so will be producing FRMPs to meet the requirements of the Flood Risk Regulations.

The flood risk management plan has been developed at two scales:

- The plan covers flooding issues for main rivers, the sea and reservoirs across the whole of the **river basin district**. This information is included as a statutory requirement.
- The river basin district is divided into **management catchments**. A catchment is an area with several, often interconnected water bodies (rivers, lakes, groundwater and coastal waters) and are based on the catchments used for river basin management planning. There are 9 management catchments within the Western Wales river basin district. The plan sets out objectives and measures to manage flood risk for communities at risk from main rivers, the sea and reservoirs within each management catchment as a statutory requirement.

Figure 1.1: The Western Wales River Basin District Management Catchments



The draft Western Wales FRMP is broadly divided into three parts:

1. The first section describes our approach to managing flood risk in Wales
2. The second section is focused on the Western Wales River Basin District and provides a description of the study area, the conclusions from the flood hazard and flood risk maps, the objectives and an overview of the flood risk management measures, all at the River Basin District scale.
3. The third section is focused on the management catchment scale and provides a description of the catchment, the conclusions from the flood hazard and flood risk maps and an overview of the flood risk management measures at a catchment scale. The catchment section includes detailed community specific measures which includes ongoing, agreed and proposed measures (Table 1.1).

Table 1.1: Description of Ongoing, Agreed and proposed Measures

<i>Ongoing</i> flood risk management measures which are already underway. These measures have already been consulted on and adopted in existing plans and are not specifically being consulted on in the FRMP.
<i>Agreed</i> measures that are already planned with funding provisionally agreed. These measures are set out in plans that have been consulted on and adopted, such as measures drawn from catchment flood risk management. They are not being specifically consulted on in this FRMP.
<i>Proposed</i> measures to be progressed from 2015 onwards that have not been consulted on previously. These are the measures that are specifically being consulted on in this FRMP.

Purpose of the environmental report

The purpose of this report is to consider the significant environmental effects of the Western Wales FRMP at the scale of the river basin district. We have assessed the environmental effects of the measures within management catchments and flood risk areas to consider their significance for the river basin district.

The strategic environmental assessment has also been undertaken to fulfil the requirements of the 'Environmental assessment of plans and programmes regulations 2004' (known as the 'strategic environmental assessment regulations'). This requires plans within certain sectors (including the water sector) that provide a framework for future

development to be subject to a strategic environmental assessment to ensure that the environment is considered from the outset. Table 1.2 sets out the requirements for an environmental report produced in accordance with the strategic environmental assessment regulations and indicates where these are addressed within this report.

Finding your way through this report

This report provides a record of how we have taken the environment into account during the development of the flood risk management plan:

- **section 2: undertaking the assessment** describes how we have undertaken the assessment of significant environmental effects and the approach to the consideration of alternatives
- **section 3: the environmental context for the plan** provides an overview of the environmental context for the plan in terms of both the physical environment and the planning and policy context
- **section 4: significant effects of the flood risk management plan** sets out the significant environmental effects of the plan at the river basin district scale
- **section 5: monitoring the effects of the plan** sets out our initial proposals to monitor the significant effects of the plan
- **section 6: what happens now?** provides further information on how you can comment on the plan and/or the environmental report and asks specific questions on which we would like to hear your views

Table 1.2: How the requirements of the strategic environmental assessment regulations are addressed in this report.

SEA regulations requirement	How this has been addressed	Section
1. An outline of the contents and main objectives of the plan or programme, and of its relationship with other relevant plans and programmes.	<i>Section 1 sets out the main objectives of flood risk management plans and an outline of the content of the plan can be found in section 4.</i> <i>Section 3 sets out the relevant key themes arising from a review of relevant plans and programmes. A full list of plans reviewed is provided in Annex A.</i>	<i>1, 3 and 4 Annex A</i>
2. The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.	<i>An overview of the river basin district is provided in Section 3. Section 4 provides a description of the current state of the ecosystem services provided by the</i>	<i>3 and 4</i>

3. The environmental characteristics of areas likely to be significantly affected.	<i>water environment and how these are likely to evolve in the absence of the plan.</i>	
4. 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.	<i>Existing environmental problems are presented as part of the baseline in Section 4.</i>	4
	<i>Consideration of designated sites (SAC, SPA and Ramsar sites) is outlined in Section 4.10, Provision of Habitat (Biodiversity)</i>	
5. 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.	<i>Environmental protection objectives are summarised as part of the review of relevant plans and programmes in Section 3.</i>	3
6. The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects.	<i>The likely significant effects of the plan are described in Section 4</i>	4
7. The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.	<i>Mitigation measures and opportunities for additional environmental improvements are provided in Section 4.</i>	4
8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	<i>Section 2 sets out the alternatives considered together with the reasons the selection of the one presented in the draft flood risk management plan.</i>	2
9. A description of the measures envisaged concerning monitoring in accordance with regulation 17.	<i>Proposals for monitoring are provided in Section 5</i>	5

10. A non-technical summary of the information provided under paragraphs 1 to 9.

A non-technical summary is provided at the front of this document and is available as a separate document.

2. Undertaking the assessment

In this section we set out how environmental issues were considered in the development of the plan; the approach to considering alternatives and how we undertook the assessment of the significant environmental effects of the draft plan.

The approach to the Strategic Environmental Assessment

The purpose of strategic environmental assessment is to integrate environmental considerations into the preparation and adoption of plans that are likely to have significant effects on the environment¹.

In designing the SEA for the draft FRMP we have taken a number of factors into account:

- FRMPs are new plans, however Risk Management Authorities² already plan for flooding and a large proportion of the Western Wales FRMP is taken from existing plans that are covered by previous consultations and accompanying SEAs. These are set out as **ongoing and agreed** flood risk management measures in the FRMP that will not be consulted on. They are described in this SEA as part of the environmental context and considered separately to the proposed measures of the FRMP.
- The Western Wales FRMP includes a number of new flood risk management measures that will be delivered from 2015 onwards. These are **proposed measures**, which are being consulted on as part of the FRMP. The proposed measures have been prioritised using NRW's Communities at Risk Register. The register prioritises coastal and fluvial flood risk operations using a risk based approach. This SEA assesses their effects on the wider environment in order to ensure the FRMP takes this into account.

Given these factors, the assessment is focused on the proposed measures and their environmental effects, whilst also identifying the cumulative effects arising from ongoing and agreed measures at a river basin district scale.

¹ Paragraph 4 of the preamble to 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 (the Strategic Environmental Assessment Directive)

² Risk Management Authorities are Environment Agency, Natural Resources Wales, Lead Local Flood Authorities, district councils for areas for which there are no unitary authorities, internal drainage boards, water companies and highway authorities

Table 2.1: Measure categories and descriptions

Measure Type	Description
Prevention	Preventing damage caused by floods: 1. By avoiding construction of houses and industries in present and future flood-prone areas; 2. By adapting existing receptors to the risk of flooding; and ensure that future developments take flood risk into account; 3. By promoting appropriate land-use.
Protection	Taking measures, both structural and non-structural, to reduce the likelihood of floods in a specific location.
Preparedness	Informing the population about flood risk and what to do in the event of a flood, including emergency response; developing emergency response plans in the case of a flood.
Recovery and Review	Returning to normal conditions as soon as possible and mitigating both the social and economic impacts on the affected population.

Ecosystems services approach and SEA

The draft FRMPs are being developed alongside the set of draft updates to the river basin management plans (RBMPs) that are being consulted on at the same time. The strategic environmental assessment of both the RBMPs and FRMPs is based on an ecosystem services approach. Using the same assessment approach for both plans allows us to directly compare the environmental effects and consider the interaction between the two plans.

The ecosystems services approach is based on the principle that a healthy functioning ecosystem will provide services that derive benefits to society that are essential for sustainable development. Examples include the essentials for life, such as clean air, water, food and fuel; services that help to regulate natural processes such as flooding; and services that contribute to wellbeing and the quality of life, such as recreation and tourism and beautiful landscapes.

Welsh Government and Natural Resources Wales have agreed that we will adopt the ecosystem approach in all our natural resource management and planning. The ecosystem approach is about managing the environment so that its different components are considered together, including its natural systems and the benefits that people get from it. The emerging Environment Bill sets out a new framework for managing natural

resources and will build on the United Nations' Convention on Biological Diversity. The approach is guided by 12 principles.

There is an increasing level of support for the adoption of an ecosystems approach in decision making processes as well as in decision support tools such as Strategic Environmental Assessment and Environmental Impact Assessment. We therefore chose to adopt the ecosystems approach as the method for assessing the environmental effects for the Strategic Environmental Assessment.

Of the 12 Core Principles of the Ecosystem Approach the SEA will specifically consider:

- Potential positive and negative effects of the plan on adjacent and other ecosystems.
- Consider potential effects of the plan on the structure and function of the ecosystem services, this in turn will influence the plan development to ensure the resilience of ecosystems.
- Potential positive and negative effects on ecosystem services, including cumulative effects. This will be assessed against specific limits where possible but where there is a lack of defined limits or data, assessment will be qualitative.
- Potential positive and negative effects on Biological Diversity itself and the services that are reliant upon it.

Figure 2.1 shows the relationship between ecosystem services and the environmental receptors we are required to consider by the Strategic Environmental Assessment regulations. This demonstrates that, even based on a conservative comparison, the ecosystem services based assessment provides coverage of the receptors required to be covered by the Regulations.

Figure 2.1: Relationship between ecosystem services and the factors required to be considered by the strategic environmental assessment regulations.

Ecosystem services		SEA Regulations environmental factors								
		Biodiversity, flora & fauna	Population & human health	Soil	Water	Air	Climatic factors	Cultural heritage	Landscape	Material assets
Provisioning services	Fresh water				*					
	Food (e.g. crops, fruit, wild collected food)	*	*							*
	Fibre & fuel (e.g. timber & wool)		*							
	Genetic resources	*								
	Biochemical, natural medicines		*							
	Water for non-consumptive use (e.g. Hydropower, navigation)		*		*					*
Regulating services	Air quality regulation					*				
	Climate regulation						*			
	Water regulation (e.g. flooding)		*		*					
	Natural hazard regulation		*							
	Disease & Pest regulation		*							
	Soil & Erosion regulation	*	*	*						
	Water purification & waste treatment	*			*					
	Pollination	*								
Noise & light regulation	*	*								
Cultural services	Cultural heritage							*	*	
	Recreation & tourism (accessible blue & green space)		*							*
	Aesthetic value (e.g. landscape, seascape, tranquility)								*	
	Intellectual & scientific, education value		*							
	Spiritual & religious value		*							
	Existence value (appreciation of nature & wildlife)	*						*	*	
Supporting services	Soil formation (geodiversity)			*						
	Primary production	*								
	Nutrient cycling			*						
	Water recycling				*					
	Photosynthesis	*								
	Provision of habitat (biodiversity)	*								

Scope of the assessment

The scope of the strategic environmental assessment has been informed by the consultation in January 2014 with Natural Resources Wales (Strategic Assessment team in Governance) and Cadw, as statutory Consultees under the SEA regulations. Appendix

B shows the comments made by the consultation bodies and how they were taken into account during the assessment.

Scoping is a continuous process and after initiating the assessment we were able to identify ecosystem services that are not anticipated to significantly change as a result of the plan. In order to focus to the assessment we undertook an initial review of the possible flood risk management measures that could be included in the plan and the ecosystem services that could be significantly affected by them. Other services were unlikely to warrant further consideration.

In addition, when undertaking the assessment there were further ecosystem services for which no significant effects were identified. In this way we have narrowed down the services which are not considered to be significant at the RBD-scale. We have therefore not given further consideration to the following ecosystem services in this report:

Provisioning services	Fibre and fuel	Ecosystems provide a great diversity of materials for construction and fuel including wood, biofuels and plant oils that are directly derived from wild and cultivated plant species.
	Genetic resources	This includes the genes and genetic information used for animal and plant breeding and biotechnology.
	The provision of biochemicals, natural medicines, pharmaceuticals	Many medicines, biocides, food additives such as alginates and biological materials are derived from ecosystems.
	The provision of ornamental resources	Animal and plant products, such as skins, shells and flowers are used as ornaments, and whole plants are used for landscaping and as ornaments.
Regulating services	Air quality regulation	Ecosystems both contribute chemicals to and extract chemicals from the atmosphere, influencing many aspects of air quality.
	Climate regulation	Ecosystems influence climate both locally and globally. For example, at the local level, changes in land cover can affect both temperature and precipitation. At the global level, ecosystems play an important role in climate by either sequestering or emitting greenhouse gases.

	Natural hazard regulation	The presence of coastal ecosystems such as saltmarsh can reduce the damage caused by hurricanes or large waves.
	Water purification and waste treatment	Ecosystems can be a source of impurities (e.g. in fresh water). However, they can help in the filtering out and decomposition of organic wastes introduced into inland waters and coastal and marine ecosystems and can also assimilate and detoxify compounds through soil and sub-soil processes.
	Pest regulation	Ecosystems are important for regulating pests that attack plants, animals and people. Ecosystems regulate pests through the activities of predators and parasites. Birds, bats, flies, wasps, frogs and fungi all act as natural controls.
	Disease regulation	Ecosystems are important for regulating vector borne diseases that attack plants, animals and people. Ecosystems regulate diseases through the activities of predators and parasites. Birds, bats, flies, wasps, frogs and fungi all act as natural controls.
	Pollination	Insects and wind pollinate plants and trees which is essential for the development of fruits, vegetables and seeds.
	Noise and light regulation	Noise, or unwanted sound, and light can have a negative effect on human well-being and wildlife, but can be regulated by ecosystems.
Cultural services	Intellectual, scientific and education value	The natural environment provides an outdoor classroom and laboratory for the study and teaching of a diverse range of subjects.
	Spiritual and religious value	Many religions attach spiritual and religious values to ecosystems or their components.
	Social relations	Ecosystems influence the types of social relations that are established and can support social cohesion and community activity.
	Existence Values	The value that individuals place on knowing that an ecosystem or component exists, even if they never use it.

We also scoped out flood risk management measures that would not be expected to significantly change any of the ecosystem services. This filtered out measures for flood preparedness, prevention and recovery and review. The assessment therefore focussed on the flood risk management protection measures that were likely to set a framework for future development. This is because flood risk management protection measures largely

involve physical works, for example building new flood defences or creating flood storage areas, which could have significant environmental effects.

Assessing significance

Significant effects of the flood risk management plan have been determined at the river basin district scale. There are no definitive criteria that can be used to determine whether an effect is significant, particularly when assessing the change to an ecosystem service. Rather we have determined significance by characterising the types of effects that would be considered to be significant:

- Effects are widespread across the river basin district.
- Local effects that are of a large enough scale to be considered significant for the river basin district. For example, this might apply to a major habitat creation project.
- Effects that are likely to result in a demonstrable change in the health and/or social or economic wellbeing of communities.

Significant effects of the plan are likely to occur over the long term. However, the assessment does note effects that could occur over the short to medium term. For clarity, we have defined these terms in the following way:

- short term – within the current proposed plan cycle, 2015 to 2021
- medium term – within the cycle covered by the first update to the plan, 2021 to 2027
- long term – beyond 2027

Assessment method

The environmental assessment followed a number of steps:

- Ongoing and agreed flood risk management measures from previously consulted on plans (e.g SMPs, CFMPs, Tidal Clwyd Strategy, Tidal Dyfi Strategy) were reviewed against the proposed measures to ensure consistency with the existing policies.
- Proposed flood risk management measures that had been screened into the SEA were assessed for their effects on the ecosystem services. We recommended mitigation to address any adverse effects and improvements that would realise additional benefits.

We undertook the assessment of effects using an Appraisal Summary Table for each management catchment. These documented the current baseline for each ecosystem

service and their evolution without plan implementation. The evolution of the baseline with implementation of the proposed measures was assessed for positive and negative effects, consideration of the duration of predicted effects and prediction of any secondary and cumulative effects. This information was considered and the significance of the predicted effect at a River Basin District scale was proposed. Chapter 4 of this report documents the outputs from this assessment, with figures showing significant positive and negative effects on ecosystem services for each community at risk, where measures have been proposed within the life of this plan.

This environmental report sets out the anticipated significant changes across the river basin district. A precautionary approach was adopted where there were uncertainties during the assessment, for example, the location or design of particular flood risk management measures, or the value of some of the ecosystem services that are likely to be affected.

Alternatives considered

Approach to developing the FRMP

In August 2012 the Environment Agency Wales consulted over a three month period about the strategic approach for developing the FRMPs for this first planning cycle (2015-2021) and also for future planning cycles. Our consultation was an e-consultation, with questions posed on our website. We also held meetings with individual organisations and invited risk management authorities and national stakeholders to contribute their views. We suggested three options for developing the flood risk management plans:

- Option A. LLFAs prepare FRMPs for flood risk areas covering local sources of flood risk. Natural Resources Wales prepares FRMPs for main river, the sea and reservoirs.
- Option B. A consolidated FRMP is produced by Natural Resources Wales in partnership with others by bringing together information from separate plans.
- Option C. A FRMP is developed in partnership through one integrated process covering all sources of flood risk.

Natural Resources Wales published the proposed way forward in June 2013, taking account of the feedback from the consultation. The preferred approach to FRMPs was option B, a consolidated FRMP, however, following correspondence and discussions with the LLFA's they opted to produce independent plans.

Ongoing and agreed measures from existing plans

As outlined in section 1, a large proportion of this flood risk management plan is directly drawn from plans that are covered by previous consultations and strategic environmental assessments (CFMPs, SMPs, Dyfi Tidal Strategy and Clwyd Tidal Strategy). These plans considered alternatives at the time and at their appropriate scale that do not require review within the FRMP and thus the FRMP SEA.

Proposed measures in the FRMP

The proposed measures of the FRMP for the river basin district set out the future management needs across catchment, shoreline and local sources of flood risk. At this scale they tend to set preliminary actions for the future investigation and development of business case appraisals and options. Further planning processes and supporting environmental assessments will focus on alternatives at such programme and project level. So the focus of alternatives for this FRMP SEA is limited and has been where the environmental assessment has identified that significant adverse environmental effects are likely from proposed flood risk management measures. This is described in sections 4.

Habitat regulation assessment

In England and Wales, the Conservation of Habitats and Species Regulations (SI 490, 2010), termed the 'Habitats Regulations', implements the EU 'Habitats Directive' (Directive (92/43/EEC) on the Conservation of natural habitats and of wild flora and fauna, and certain elements of the 'Birds Directive' (2009/147/EC). This legislation provides the legal framework for the protection of habitats and species of European importance in Wales. The protected sites comprise Special Areas of Conservation (SAC), Special Protection Areas (SPAs, classified under the Birds Directive), candidate SACs (cSAC), Sites of Community Importance (SCIs) and, as a matter of government policy, to potential Special Protection Areas (pSPA) and Ramsar sites (sites designated under the 1971 Ramsar

Convention for their internationally important wetlands). These sites are referred to collectively in this report as 'European sites'. Regulation 9(5) of the Habitats Regulations requires that a competent authority must consider the requirements of Habitats Directive in exercising any of its functions which includes assessment of plans and projects potentially affecting European sites.

It is considered that the flood risk management plan fits within the definitions of a 'plan' as defined by the Habitats Directive. The FRMP therefore requires a Habitats Regulations Assessment (HRA), and this will be tailored to be appropriate for the nature of the plan. The HRA will be reported separately following discussion with Natural Resources Wales (Strategic Assessment Team in Governance Directorate). Effects on SPAs, SACs and Ramsar sites have also been considered as part of the SEA, within the ecosystem service 'Provision of Habitat', and initial findings suggest that the flood risk management measures are unlikely to have significant effects on the SPAs, SACs and Ramsar sites.

Notwithstanding this conclusion, existing plans that have contributed to the FRMP have undergone their own HRA prior to their adoption and may have identified significant effects. In these cases, we have taken these findings into account in the assessment of the overall plan and adopted a precautionary approach. However, it is not the intention of this plan to reopen consideration of the HRA or any Statements of Case made as part of the HRA.

3. The environmental context for the plan

In this section we provide an overview of the environmental context for the Western Wales RBD. We also consider how other national and local plans relate to FRMP. In some cases these will provide opportunities through shared objectives or areas of activities. In others there are potential challenges where objectives may appear to conflict with those things that the FRMP is seeking to achieve.

The Western Wales River Basin District

The Western Wales River Basin District covers an area of 16,653 square kilometres. It extends across the entire western half of Wales, from the Vale of Glamorgan in the south to Denbighshire in the north.

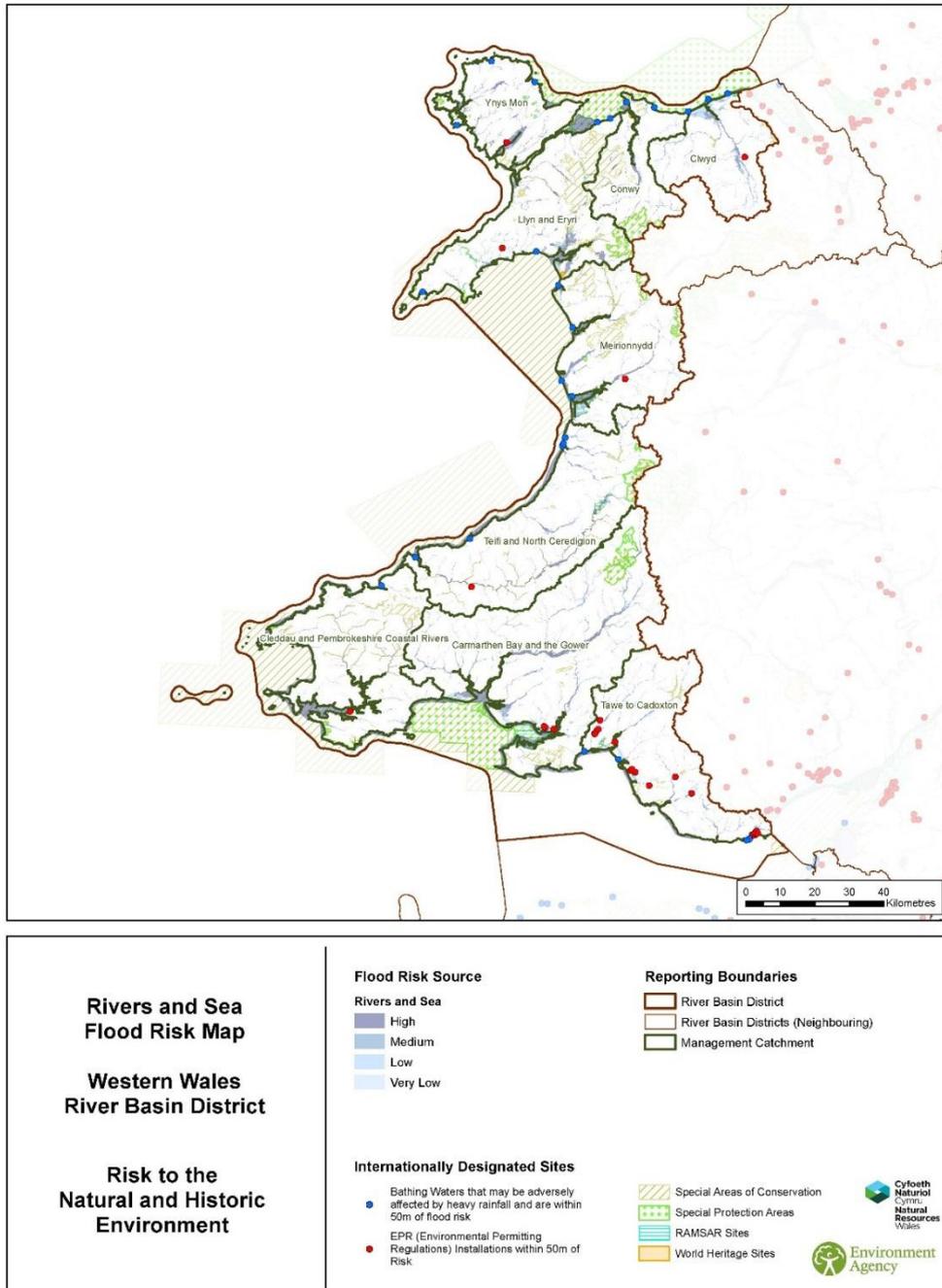
The main centres of population are restricted to the coastal strip and the westernmost part of the South Wales valleys. The main urban centres are Swansea, Bridgend and Neath in the south, Aberystwyth in the centre on the coast and Bangor in the north. The river basin district is primarily rural, with land mainly used for agriculture and forestry. Thriving marine, oil and gas industries are critical economic activities, along with heavy industry such as the steel works at Port Talbot and commercial fisheries and tourism around the Welsh coastline.

The lakes and rivers of the district are renowned for their game and coarse fishing. Salmon, brown trout and sea trout are present in many of the rivers, and bring in significant revenue to the district through fishing-related tourism. The coastal waters offer a diverse range of sea fishing both recreational and commercial. The coast of the Western Wales River Basin District contains hugely important environmental and economic assets. In addition some 70 per cent of the District's coastline is designated (under European Union Directives and UK law) for its environmental quality.

There are large and valuable cockle beds at Traeth Lavan in the north and The Burry inlet in the south. Mussels are harvested from natural beds in the Conwy and Dyfi and farmed in the Menai Strait on some of the most productive mussel beds in Europe. Much of the upland is given over to livestock farming (in particular sheep rearing) and forestry. Dairy farming is dominant on the gentler slopes of Pembrokeshire and Carmarthenshire, and the milder climate of South Pembrokeshire also allows for significant arable production.

The dramatic environment of the District's coast and the proximity of significant population also helps explain the importance of the coastal tourism industry which contributes over £350 million each year to the Welsh economy.

Figure 3.1 Main rivers and the sea – natural and historic environment at risk



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A more detailed baseline for those services scoped into the assessment is presented in Section 4. The environmental baseline has been developed in close collaboration with the river basin management plans. Should you wish to have more detail on the environmental context for each of the management catchments.

Review of relevant plans and policies within the Western Wales River Basin District

The SEA Regulations require that consideration is given to the relationship with other plans and programmes and environmental objectives set at an international, (European) community or national level. Given the geographical scale of this plan, only relevant policies, plans, strategies and legislation relevant to the RBD have been considered as part of this review. Table 3.1 sets out the key themes arising from the policy review. The purpose of the review is to take account of the objectives of these key documents in the assessment with a view to aligning the Plan to compliment and work with other environmental policies and legislation rather than against. The documents consulted are detailed in Annex A.

The plan review can also help to identify where other planning processes and organisations may be able to work with the flood risk management planning process. Table 3.1 below lists the main themes emerging from this review in terms of areas of possible mutual influence with respect to the FRMP.

Table 3.1 Main themes from the review of policies, plans, programmes

Environmental Topic	Common Themes
Maintain and restore habitats	The Flood Risk Management Plan objectives will help to deliver improvements to the natural environment through reductions in habitat loss and mortality through flood events, so is consistent with PPP aims to protect, maintain and enhance the quality of the terrestrial environment. Aquatic habitats, however, need to be considered in the design and implementation of measures to achieve the objectives, and care must be taken to ensure the physical infrastructure implemented through the FRMPs do not damage or inhibit restoration of these aquatic habitats.
Improve status and diversity of species	The policy direction is to protect and enhance biodiversity and the natural environment; implementation of the FRMP must ensure steps are taken to protect, compensate and enhance biodiversity and habitats to enable alignment with the PPP.
Landscape	The PPP generally aim to conserve and enhance valuable landscapes; there are opportunities for changes in land use or land management to benefit the landscape, along with delivering the FRMP objectives to reduce flood risk.

Environmental Topic	Common Themes
Water resources / efficiency / water abstraction	The PPP aspires to protect natural resources. Some PPPs promote reducing water use and greater water efficiency, while others will put pressure on water resources. There is limited interaction between the FRMP and the conservation of water resources, but care must be taken to ensure that reductions in flood risk through, most notably, improved defence infrastructure projects is not at the expense of water resources.
Water quality	There is alignment within the PPPs that potable and non-potable water quality should be both protected and enhanced, through a wide range of strategies. Care must be taken to ensure that reductions in flood risk through, most notably, improved defence infrastructure projects is not at the expense of potable water supplies.
Flood risk	The PPPs concur that the management of flood risk, and also raising awareness of flood risk is desirable and should be supported. However, this should be progressed whilst also considering the wider environment and potential effects of reducing flood risk. A move away from direct flood defence is evident, with flood risk management offering the potential for delivering wider environmental enhancements. The FRMPs will align with this PPP theme.
Waste/ pollution	The PPP outline a desire to reduce waste and increase resource efficiency. Reducing waste and pollution will be driven, indirectly, by the FRMP so there is broad alignment between the FRMP and the PPP.
Material assets	The aim of the PPP is to provide sustainable transport networks. The FRMP will help to deliver this aim through reduction in flood risk to key infrastructure where required.
Planning	The PPPs set out that future land use planning should be undertaken through the principle of sustainable development, and also that the water environment should be specifically considered. The FRMP will assist in the achievement of these aims through reductions in flood risk in a greater number of areas. Care must be taken to ensure this reduction in flood risk does not compromise other factors to sustainable development.
Mitigation and adaptation to climate change	The recognition of the need to adapt to climate change is a common theme through the PPP and this encompasses a wide range of changes to the economy, society and environmental management such as changes to land use practices and soil management. Adapting to an increased flood risk due to more frequent and severe extreme events and sea-level rise is a primary theme of the PPP, and the FRMP aims to deliver this adaptation.
Land Use	Farming practices are changing to ensure long-term sustainability of the industry, e.g., a move to organic farming, promotion of locally-based producers; and agricultural practices increasingly seeking to protect and enhance the landscape. Woodland management is aspiring to high-quality woodlands, with a diverse mixture of species and habitats. The FRMPs will reduce flood risk to agricultural, urban and other areas and will protect key land uses.
Natural Resources	Managing Wales' natural resources is a key direction within the PPPs, and includes maintaining the diversity of species and habitats and Wales' landscape and heritage assets, whilst realising the economic benefits of forestry, fisheries, agriculture and mineral resources. There is a desire to challenge traditional approaches to managing flood within the PPP, putting much greater emphasis on the management of the flood risk as whole, starting with retaining more water in uplands and slowing its rate of movement, allowing more areas of lowland to

Environmental Topic	Common Themes
Water-based/ waterside recreation and tourism	flood naturally to dissipate impacts. This approach will be actively considered within the FRMP.
Historic Environment	The PPP identifies the water environment as a key tourist and recreation resource. It promotes opportunities to provide appropriate water-based recreation. The FRMPs need to take into account the use of Wales' rivers, lakes and coastal waters as an outdoor recreation and health resource. Access to these waters should not be compromised through the achievement of the FRMP objectives so their recreational use is retained.
	The FRMP should ensure that it does not compromise the historic environment in achieving its objectives, as the PPPs outline a desire to conserve and enhance heritage assets, and provide a framework to value these assets.

4. Significant effects of the Western Wales Flood Risk

Management Plan

In this section we set out the significant effects of the FRMP. We have presented these in terms of how they affect the ecosystem services we currently receive from the water and related environment. Where adverse effects occur we have proposed mitigation that will assist in avoiding or reducing them. We have undertaken the assessment of environmental effects using a combination of previous experience of the catchments and using our wider experience of strategic environmental assessment.

Overview of the effects of the updated Western Wales Flood Risk Management Plan

As outlined in section 2, in scoping the assessment we focussed on the statutory flood risk management measures that set the framework for development consent or make a decision about a particular option for managing flood risk. These are generally categorised as protection measures. We scoped out prevention measures (for example avoidance measures, land use planning and individual property protection), preparedness measures (for example flood forecasting, flood warning and public awareness) and recovery and review measures (for example clean-up work and supporting activities following a flood event). This meant that quite a large proportion of the agreed, ongoing and proposed measures were scoped out of the assessment.

While prevention, preparedness and recovery have been scoped out of the assessment, it is important to acknowledge the health and wellbeing benefits associated with these measures. There is strong evidence that demonstrates the adverse health effects of flooding. Deaths can occur, but more frequent and widespread are the psychological effects. In a study into the social impacts of flooding in Scotland³, intangible impacts were considered to be more important than material losses. Intangible impacts included the stress of the flood itself, the anxiety of being out of one's home, the discomfort of living in temporary accommodation and the time and effort in dealing with insurers and builders. Longer lasting impacts included the fear of future flooding and the loss of sentimental/irreplaceable items. These effects were exacerbated when they affected low income families, the elderly or other vulnerable groups. The stress can result in physical or mental health problems and has also been shown to exacerbate pre-existing conditions. There are subsequent economic effects on the health care system and businesses whose employees are affected.

³ Werritty A, et al (2007), Exploring the social impacts of flood risk and flooding in Scotland, Scottish Executive Social Research, Edinburgh.

Prevention measures offer the opportunity to avoid these adverse social and health effects. Preparedness and recovery measures can provide mitigation to reduce the severity of the effects. For example, the provision of, or improvements to, flood warning enables people to move treasured belongings to a safe place, to deploy individual property protection, to turn off electricity and gas before vacating a property and allows public services to manage closures (such as roads or railways) to improve the safety of the public. These not only reduce the stress of the flooding event itself, but will aid the recovery process.

Table 4.1: Number of proposed measures for the Western Wales FRMP

Measures	Cadoxton Tawe to Bay & Gower	Carmarthen Bay & Gower	Pembrokeshire Cleddau & Ceredigion	Teifi & North Ceredigion	Meirionnydd	Llyn & Eryri	Ynys Mon	Conwy	Clwyd
Prevention	22	18	2	11	5	5	6	8	7
Preparedness	37	26	16	26	12	15	0	9	13
Protection	2	6	7	4	18	23	7	11	6
Recovery and Review	0	0	0	0	0	0	0	0	0

The assessment focussed on the most significant effects to the range of ecosystem services. This considered both which types of measures typically caused effects and which ecosystem services would be more affected than others. The results below are set out as follows:

- effects that are potentially significant across the river basin district
- effects that are potentially less significant at this scale but would be more locally significant
- effects on ecosystem supporting services

Significant effects of the Western Wales flood risk management plan

The flood risk management plan was assessed as having potentially significant effects on the following ecosystem services at an RBD scale:

Provisioning Services

- Food

Regulating Services

- Water regulation
- Soil and erosion regulation

Cultural Services

- Cultural heritage
- Recreation and tourism
- Aesthetic value

Supporting services

- Provision of habitat (Biodiversity)

We have set out below, under each of these headings, an outline of the current status of the service within the river basin district, how the service is considered to change as a result of the flood risk management plan and any mitigation likely to be required if the effects are considered to be adverse.

For the purposes of the assessment the following assumptions were made:

- Existing plans for flood risk management in the Western Wales RBD were taken to comprise the CFMPs, SMPs, Tidal Clwyd Flood Risk Management Strategy and Tidal Dyfi Flood Risk Management Strategy.

1. Food (e.g. crops, fruit, wild collected food)

What are Food services?

Ecosystems provide the conditions for growing food. Food comes principally from managed agro-ecosystems but marine and freshwater systems or forests also provide food for human consumption.

What is the current baseline in this service in the Western Wales RBD?

The RBD is primarily rural in character, with urban centres situated in the lower catchments to the south. Rural land in the Western Wales RBD is mainly used for agriculture and forestry. Mixed sheep and beef-cattle farming is undertaken in the uplands. The Carmarthen Bay Estuary supports commercial fishing, including an important cockle fishery situated within the estuary. The upper waters also support salmon and trout game fishing with excellent fly fishing for Brown Trout, Sea Trout, Salmon and Grayling.

Future baseline – what food services are likely to be provided in future in the absence of the plan?

In the absence of the plan, the management of land and waters for agricultural purposes and the production of food is likely to continue, with increased technological and scientific advancements enhancing the productivity of the land and waters within the RBD and thus the amount of food that is produced. Development in the lower areas of the RBD are likely to encroach onto agricultural land around the urban centres such as Swansea, Bridgend and Carmarthen, which will reduce the amount of agricultural land available and thus the amount of food produced and the value of this service in the RBD. Increasing use of the lower catchment for industrial use could cause changes to water quality and availability, which in turn could decrease fish populations.

What is the change in benefits to this service predicted through the Western Wales FRMP?

Key measures that result in potential effects on the food service in the RBD include:

- In the short term, construction of new defences and schemes may result in small reductions of available agricultural land depending upon the design implemented. The majority of works planned are to existing assets however, so land-take will be minimal. This loss may result in reduced food supply and increased costs to the farmers in this area. However, in the long term the works would cause a positive effect as the agricultural land behind the defences would be protected from flooding and potential damage to crops.
- In the long term, there is the potential for deterioration in fish habitats through reductions in geomorphological diversity, and in the short term increased fish mortality from in-river works, from channel conveyance improvements. This could reduce the fish populations in the channel and have a negative effect on the food service. The dredging assessments planned across the RBD may result in more sustainable management of channels, and restore natural sedimentation processes which could lead to an improvement in fish habitats in the future.
- There are potential long-term positive and negative effects anticipated from future works carried out as a result of the initial assessments. There could be a positive effect where flooding is reduced or prevented to agricultural land on the floodplain

surrounding the towns, thereby reducing crop and soil damage. There is also potential for a negative effect where a new scheme may reduce the amount of land available for agricultural use through land take for embankments or storage areas. Lastly, measures could affect natural habitats, for example blockstone reinforcement of eroding river banks could reduce the habitat suitability of the river for fish, and cause a decline in local fish populations resulting in a negative effect.

Overall, it is anticipated that as a result of the FRMP there will be a direct minor negative effect on the food services provided within the Western Wales RBD in the long-term as a result of agricultural land-take and deterioration of fish habitats but the FRMPs will provide an indirect beneficial effect by ensuring effects from flooding are minimised in these areas. Effects will largely be confined to the areas surrounding the communities where the actions are to be implemented, and these are concentrated in urban areas in the south of the RBD and around the coast as shown in Figure 4.1.

To mitigate for potential negative effects on this service, the following mitigation should be implemented:

- Site works away from highest grades of agricultural land (i.e. Grade 1 or 2 ALC land);
- Inform and engage with affected landowners to minimise potential effects; and
- Future schemes and works will need to have regard to potential impacts on fish habitats and passage and ensure that all works are compliant with European Directives as well as seeking opportunities to enhance habitat diversity. This will be particularly important in catchments with locally important local fisheries and or spawning areas.

What are the significant effects of implementing the Western Wales FRMP on this service?

Implementation of the Western Wales FRMP is not anticipated to have a significant effect on the food services in the RBD, however there is anticipated to be a minor, negative effect to the food services overall, concentrated in specific areas of the RBD. Indirectly there could be benefits through reductions in flood damages. The main affected parties from these effects will be the agricultural and fishing industries as their land may be less productive and the water environment may not support the same fish and shellfisheries populations. The indirect and cumulative effects of the improvements to the food service are outlined in Section 3 below.

2. Water Regulation (e.g. flooding)

What are water regulation services?

The timing and magnitude of run-off, flooding and aquifer recharge can be strongly influenced by changes in land cover, including, in particular, alterations that change the water-storage potential of the system such as the conversion of wetlands or the replacement of forests with farmland or farmland with urban areas.

What is the current baseline in this service in the Western Wales RBD?

The RBD includes a large proportion of the extensive Welsh coastline and 60% of the population of Wales live on or near to the coast. The Wales Coastal Flooding Review⁴ estimate that of the order of 80,000 properties are potentially at risk around the coast for a 0.1% chance incident. This is a flood incident that has a statistical chance of 0.1% occurring in any given year. Wales has a network of coastal defences that has typically evolved to meet local needs. At individual locations this can consist of individual structures such as walls and embankments, but in many locations is provided by a complex interaction between the foreshore conditions and the defences. Foreshore conditions can include offshore structures, groyne, salt-marsh and beaches. These can help to manage the movement and loss of sediment, as well as dissipate wave energy before it hits the defence line.

⁴ Wales Coastal Flooding review, Phase 2 Report. Natural Resources Wales. 30 April 2014

The rivers of the Western Wales RBD radiate outwards from the central upland areas to the coast. The major catchments in the district include the Clwyd and Conwy in North Wales, the Mawddach, Dyfi and Teifi in mid Wales and the Towe, Tawe and Neath in South Wales. Storage in the upland catchments in reservoirs such as Llyn Brienne and bog areas such as Cors Caron can store water for a time, reducing the risk of flooding lower in the RBD.

Land use within the Western Wales RBD is predominantly agricultural, forestry and urban, with localised areas of upland peat bog. Physical modifications are present in every catchment of the RBD and 7% of water bodies in the Western Wales RBD are failing to meet their objectives due to physical modifications. Structures built to divert, transport and store water, for example can change the natural flow of water through catchments. The main types include deepening, straightening and culverting channels for flood defence, drainage and navigation as well as building structures such as weirs, penstocks, tidal sluices and flood banks. These alterations have significant benefits for people and the economy, but many have negative impacts on wildlife, for example, acting as barriers to fish migration and reducing the diversity and quality of habitats. Alterations can also disconnect rivers from their natural floodplain, thus reducing the capacity of areas to naturally retain and store flood water and filter sediments and pollutants.

Flooding and coastal erosion are two of the biggest natural hazard risks affecting the safety and sustainability of communities across Wales, with one in six properties estimated as being at risk of flooding from rivers, the sea and surface water.⁵ There are 1,551,656 people and 4,282 services in the River Basin District. Of these, 40,952 people and 264 services are considered to be at medium risk of flooding with a 1 in 100 (1%) of greater chance of flooding in any given year. The majority of these high risk communities are located in coastal areas or on main rivers within the southern catchments, where population densities are much higher than in the northern RBD catchments.

⁵ National Strategy for Flood and Coastal Erosion Risk Management in Wales. Welsh Government 2012.

The urban areas of the RBD (e.g. Swansea, Bangor, Aberystwyth, Port Talbot, Bridgend) are characterised by heavily modified watercourses with residential and industrial development leading to the loss of the original floodplain. Surface water run-off from urban areas and highways is typically 'flashy' reacting quickly to rainfall events and increasing the risk of fluvial and surface water flooding.

Future baseline – what water regulation services are likely to be provided in future in the absence of the plan?

In the absence of the plan, water regulation services are likely to be under increasing pressure in the Western Wales RBD due to new development, agricultural intensification and climate change. Urban expansion, for example, will lead to greater rates of surface water run-off and further reduce the capacity of natural floodplains to retain and store flood waters. Agricultural intensification could also increase surface water run-off in rural areas of the RBD.

Water regulation services will be affected by flood risk management activities under existing plans. These activities include: the implementation of planned flood alleviation schemes; the refurbishment and or improvement of existing flood defence assets; the extension of individual Property Level Protection programmes; the creation of SuDs in urban and rural areas; continued watercourse maintenance works; initiatives for naturalising watercourses (e.g. deculverting) and reconnecting watercourses with their flood plain, such as the removal of existing raised defences; and localised initiatives for managed realignment and habitat creation. These activities could impact water regulation services in different ways depending on the type and scale of the action. For example, new flood alleviation schemes that adopt hard engineering solutions will have a negative impact as a result of changes to the natural morphology of a watercourse and by disconnecting the watercourse from its natural floodplain. Other measures have the potential to benefit water regulation services by working with natural processes to reduce surface water run-off and re-establishing the natural functioning of a watercourse. This includes, for example, initiatives for deculverting and the creation of urban and rural SuDs.

Identified opportunities for the removal of existing raised defences and management realignment with associated habitat creation are also likely to benefit water regulation services by reconnecting watercourses to their natural floodplain. This will improve the capacity of these areas to naturally retain and store water as well as facilitate its infiltration, which in turn could help to reduce the magnitude and response times of water flows downstream and in coastal areas help to accommodate tidal waters.

Notwithstanding these effects, in the longer term water regulation services in the RBD are likely to be under increased pressure as a result of predicted changes in climate change. UKCIP predictions show that by the 2050s within the Western Wales RBD winter rainfall could increase (e.g. from 2% to 27%). Although summer rainfall is predicted to potentially decrease by over a third, changes in weather patterns may lead to an increase in storm events. Sea levels are also expected to rise and there is likely to be an increase in tidal flood risk. These changes could reduce the availability of water particularly in the summer months, whilst also increasing the number of people and properties at risk from flooding.

What is the change in benefits to this service predicted through the Western Wales FRMP?

Key measures that result in potential effects on the water regulation service in the RBD include:

- Channel conveyance improvements and dredging assessments will improve the water regulation service through improved drainage ability of the RBD, and less risk of flooding from blocked culverts, leading to a short-term, positive effect. Minor improvements, repairs to defences and creation of storage areas across the RBD will also deliver reductions in flood risk; and
- Initial assessments resulting in the implementation of flood alleviation schemes and improving the standard of protection of existing flood risk assets could have negative effects on water regulation services depending on the type and design of the action/works. Measures that involve raising existing flood defences in the longer term in response to climate change will serve to sustain or increase the disconnection between a watercourse and its natural flood plain preventing opportunities for improved storage and infiltration. Potential flood alleviation

schemes in identified communities that employ hard engineering solutions and result in extensive physical modifications of the channel and banks could also adversely affect natural processes through the loss of habitats, reduced morphological diversity and exacerbating surface water run-off from surrounding areas.

It is recognised that many of these actions could be implemented in a number of ways to achieve the desired reductions in flood risk. Renaturalising watercourses (e.g. de-culverting) and reductions in the intensity of maintenance activities will also provide positive benefits for water regulation by facilitating more natural watercourses in terms of their channel morphology and habitats. The creation and re-establishment of habitats, for example, will help to further reduce surface water run-off from entering watercourses, whilst improving morphological diversity will help to slow water flows and the response times of watercourses to rainfall events.

The removal or setting back of existing flood defences and opportunities for managed realignment together with associated habitat creation (e.g. saltmarsh, flood plain grazing marsh), is also likely to benefit water regulation services. Such measures will help to reconnect watercourses with their floodplain and support their capacity to store water and facilitate its infiltration. Initiatives for managed realignment associated with the National Habitat Creation Programme, will maintain the capacity of these areas to accommodate tidal waters and help to dissipate the erosive capacity of tidal waters as well as improve the resilience of these areas to storm events.

Overall, it is anticipated that as a result of the plan there will be a minor positive effect on the water regulation service provided within the Western Wales RBD. Effects will largely be confined to the areas surrounding the communities where the actions are to be implemented, concentrated in the southern, more populous area of the RBD and around the coast as shown in Figure 4.2.

How significant are the predicted changes to water regulation services in the Western Wales RBD?

Implementation of the plan is anticipated to have a significant effect on the water regulation services in the RBD. This effect will be positive overall but confined to the specific communities where actions will be implemented. The main beneficiaries of this positive effect will be the residents and business in low-lying and urban areas of the RBD, as their flood risk will be reduced.

Measures for improving the standard of protection of existing defences, the refurbishment or replacement of existing assets and the new schemes to address flood risk in identified communities have the potential to adversely affect water regulation services locally depending on the type and design of the preferred option. In developing projects, consideration should be given to approaches that avoid potential negative impacts and interventions that as far as possible utilise natural processes, such as the use of SuDs, re-naturalising modified watercourses and incorporating habitat creation. The indirect and cumulative effects of the improvements to the water regulation service are outlined in Section 3 below.

3. Soil and Erosion Regulation

What are soil and erosion regulation services?

Soil erosion is a naturally-occurring process involving the mobilisation and deposition of soil particles, mainly by water and air. Erosion Regulation Services are a means of describing the ability of habitats and plants to help retain soils and reduce rates of erosion.

What is the current baseline in this service in the Western Wales RBD?

Rates of soil erosion are influenced by factors such as rainfall, slope, soil type and the type and extent of vegetation cover. Where vegetation is removed through cropping, grazing or deforestation for example, erosion rates generally increase. Agricultural practice is considered to be the main cause of soil erosion in Wales. With its high rainfall, steep upland catchments and a relatively large amount of rural land used for agriculture, soil erosion rates have the potential to be high in the Western Wales RBD.

Soil erosion and sedimentation is a widespread issue, the majority caused by high rates of surface water run-off from agricultural land (diffuse pollution). This is typically the result of limited riparian buffer zones, agricultural practices, soil compaction, bankside damage caused by livestock poaching and heavy rainfall events.

Some soil types are more susceptible to erosion in the Western Wales RBD. The acid upland soils in elevated catchments of the RBD are at risk of gullyng and loss of particulate matter, especially where the vegetation is lost or damaged. The thin acid soils on steep fell slopes can also be affected by erosion especially through grazing or walking pressures. Localised erosion from rivers and lakes in the RBD is also occurring, and coastal erosion from wave action.

Future baseline – what soil and erosion regulation services are likely to be provided in future in the absence of the plan?

In the absence of the plan, predicted climate change and subsequent increased severity of weather events, erosion from rainfall, increased river levels and storm damage (e.g. falling trees), as well as predicted population growth and subsequent increased urbanisation and intensification of food production will lead to more soil erosion within the RBD and the erosion regulation service to be lessened. Ongoing initiatives to restore peatlands could lessen the changes to this service and reduce rates of erosion in upland areas and there is a growing awareness of good soil management in the agricultural community leading to improved yield.

Climate change resulting in sea level rise and increased storminess could also exacerbate coastal erosion in certain locations, for example the erosion of sand dunes near Pwllheli.

What is the change in benefits to this service predicted through the Western Wales FRMP?

Key measures that result in potential effects on the soil and erosion regulation service in the RBD include:

- Initial assessments, leading to construction of flood alleviation schemes could have a potential long-term, positive effect where flooding and storm damage, and thus erosion across the floodplain, is reduced or prevented. There is the potential for localised increased rates of soil or coastal erosion during and immediately after construction where vegetation cover is lost and topsoil is stripped and stored. However, this can be managed with appropriate soil storage and management practices, monitored through the Environmental Action Plan (EAP).
- The addition of further hard-bank infrastructure from the initial assessments such as flood walls or revetments, and also the repairs to existing infrastructure, could potentially affect natural sedimentation processes and erosion regimes to the adjacent river bank or coast, leading to a negative, long-term effect.
- Creation of storage areas and impoundment structures could change the erosion regime in the RBD, and cause artificial settling and deposition of settlements upstream, leading to an overall negative effect. These measures are limited in extent to a small number of communities so effects are not anticipated to be significant.
- Dredging assessments, to evaluate the environmental impact and overall effectiveness of dredging in some rivers in the RBD, could have either positive or negative effects on this service, through potential reductions in dredging allowing natural erosion regimes to re-established, or enhanced levels of dredging required in response to increasing flood risk.

Overall, it is anticipated that as a result of the FRMP there will be a direct minor positive effect on the soil and erosion services provided within the Western Wales RBD in the long-term as a result of reductions in the risk of extensive storm-damage and erosion from flood events, and also from changes to dredging regimes. Effects will largely be confined to the areas surrounding the communities where the actions are to be implemented, and those further downstream in the case of the fluvial communities. These are concentrated in the south east of the RBD and around the west coast as shown in Figure 4.3.

What are the significant effects of implementing the Western Wales FRMP on this service?

Implementation of the Western Wales FRMP is not anticipated to have a significant effect on the soil and erosion regulation services in the RBD, however there is anticipated to be a minor, positive effect to the service overall, concentrated in specific areas of the RBD. The main beneficiaries from this effect will be the residents of the communities, the angling community as natural erosion regimes are restored and the agricultural industries where land will be subject to less erosion. The indirect and cumulative effects of the improvements to the soil and erosion regulation service are outlined in Section 3 below.

4. Cultural Heritage

What are cultural heritage services?

Many societies place high value on the maintenance of both historically important landscapes ('cultural landscapes') and other features (buildings, archaeology, and links to past industrial uses).

What is the current baseline in this service in the Western Wales RBD?

The Western Wales RBD has a wealth of designated heritage assets, for example, scheduled monuments, listed buildings, registered parks and gardens and conservation areas. These assets occur throughout the RBD and are typically associated with Wales' historic coastal and riverside towns, including Aberystwyth, Porthmadog, Laugharne, Llandudno and Lampeter. There is a World Heritage Site within the RBD, the Castles and Town Walls of King Edward in Gwynedd (four sites: Beaumaris, Caernarfon, Harlech and Conwy). The seas around Wales contain an immense wealth of archaeological sites and remains and many coastal sites and wrecks have been scheduled and some are protected under the Protection of Wrecks Act 1973.

There are more than 2,500 Scheduled Monuments, as well as numerous sites of historical or archaeological importance within the RBD (e.g. Listed Buildings, and approximately 200 Registered Historic Parks and Gardens). Inland, many structures such as mills, bridges,

weirs and sluices within the RBD have listed status or are of local historic importance. The legacy of mining in the RBD has impacted on water quality, but surviving mine features may also be important for their heritage value. A large number of Wales' 58 Historic Landscapes fall within the RBD, covering over 300,000ha. Archaeological features associated with the flood plain and land saturated by groundwater can be put at risk from drying out, erosion or inundation.

Future baseline – what cultural heritage services are likely to be provided in future in the absence of the plan?

The future baseline for cultural services is dependent on the actions of a range of stakeholders (e.g. public, private and voluntary sectors) to conserve and enhance the historic environment, heritage assets and their settings. In the absence of the plan, there is the potential for heritage assets within the Western Wales RBD to be affected by the abstraction of water and the resulting changes in groundwater flows and chemistry on buried, waterlogged archaeological and palaeo-environmental remains associated with the river valleys, floodplains and wetland habitats. Also by the implementation of planned flood alleviation schemes; the refurbishment and or improvement of existing flood defence assets; the extension of individual Property Level Protection programmes; the creation of SuDs in urban and rural areas; continued watercourse maintenance works; and localised initiatives for managed realignment and habitat creation.

In particular, works that involve excavation may impact on archaeological remains whilst the introduction of new structures or features could harm the character and appearance of historic townscapes or affect the setting of heritage assets. Heritage assets may also be subject to increased flood risk as a result of climate change and increased development pressures in urban areas leading to more frequent and intense fluvial and surface water flooding events.

What is the change in benefits to this service predicted through the Western Wales FRMP?

Key measures resulting in potential negative effects to the cultural heritage service in the RBD include changes to land use or intrusive excavation works associated with

maintaining, improving or constructing new defences. These activities could potentially harm features of historic interest and archaeological remains, including peat deposits and palaeo-environmental channels as well as buried archaeological remains and built heritage assets such as listed bridges, weirs or mills.

Schemes associated with managed realignment through the NHCP could potentially affect heritage assets located along the coast. This may result from additional land take for the relocated defences as well as the possibility of increasing the magnitude and frequency of inundations. Flood embankments may also be of historic interest in their own right and contribute to the historic character of the local landscape.

There is the potential, however, for measures to deliver potential benefits for cultural heritage services. Locally, the refurbishment/replacement of existing flood risk assets may provide the opportunity to improve designs that reduce their visual impact on the setting of heritage assets or the surrounding historic townscape. Maintaining the level of flood defence and the implementation of flood alleviation schemes in identified communities is also likely to benefit heritage assets in these areas by reducing their risk of flooding and helping to sustain their continued use and maintenance.

To mitigate for the potential negative effects, a cultural heritage assessment of any intrusive works should be undertaken, maximising use of local knowledge, prior to implementing the relevant measure. This will ensure all effects on the archaeological or built heritage resource are managed appropriately. There are opportunities for delivering localised positive changes in cultural heritage services by preserving and recording heritage at risk and by increasing awareness, understanding and enjoyment of the historic environment. These positive changes could occur through increasing the awareness of landowners and local communities of water related heritage assets and their significance; promoting their conservation and enhancement as part of an integrated approach to catchment management and sustainable land management; and improving public access and interpretation.

Overall, it is anticipated that as a result of the FRMP there will potentially be a minor negative effect on the cultural heritage services provided within the Western Wales RBD. This is highly dependent upon the siting of measures however, as the cultural heritage value within the RBD is confined to distinct spatial areas and landscapes, and avoidance of these by measures will minimise the potential for effects. Effects will largely be confined to communities where actions are proposed as shown in Figure 4.4. Works within the centre of settlements will primarily need to consider built heritage assets, whereas works upstream or downstream of the communities, associated potentially with storage areas or impoundment structures may need to consider buried archaeology in more detail.

How significant are the predicted changes to cultural heritage services in the Western Wales RBD?

Implementation of the Western Wales FRMP is not anticipated to have a potential significant effect on cultural heritage services, however is anticipated to have a minor negative effect. This adopts a precautionary approach given the high degree of uncertainty across the majority of the RBD as to the design of measures and the nature of cultural heritage features that could be affected. The main parties subject to this negative effect will be the users of and visitors to assets, as the appreciators of the cultural heritage of the RBD. The intrinsic heritage value of the RBD could also be affected.

To conserve and enhance the historic environment it will be important that individual schemes at the earliest stage identify any designated or non-designated heritage assets, including the risk of unknown buried archaeology, in order to: establish the potential for adverse effects as well as opportunities for enhancement; determine whether any action should be taken due to the significance of the heritage assets and likely impacts; inform scheme options and detailed design; and identify an appropriate mitigation strategy.

If potential adverse effects are identified, scheme specific mitigation will need to be developed in consultation with the relevant organisations, including Cadw, the relevant Archaeological Trust and the local authority conservation officer. The indirect and cumulative effects of the improvements to the cultural heritage service are outlined in Section 3 below.

5. Recreation and Tourism (including accessible blue and green space)

What are recreation and tourism services?

People often choose where to spend their leisure time based, in part, on the characteristics of the natural or cultivated landscapes in a particular area.

What is the current baseline in this service in the Western Wales RBD?

Recreational and tourism opportunities within the RBD are extremely varied from angling and water sports to walking and popular visitor destinations such as Snowdonia, Anglesey, Pembrokeshire, the Gower, and the Brecon Beacons. Tourism is a major part of the local economy within the RBD, but especially within these areas.

The RBD has a network of walks including the Wales Coast Path, which attracts a significant numbers of visitors, approximately 3 million people within the first 12 months of it opening. There is a variety of navigation and water sports in the RBD, including canoeing, rowing, sailing and wind surfing. There are also numerous biking opportunities in the RBD from mountain biking in Coed y Brenin near Dolgellau, to cycling along the Millennium Coastal Path at Llanelli. Also, the high quality and quantity of beaches around the coast are an important asset to the RBD, providing recreational opportunities for the benefit of people living in and visiting Wales.

Angling is a popular recreational activity within the RBD. Salmon, sea trout and trout fishing on rivers such as the Teifi, coarse fishing in lakes and canals such as the Neath Canal and sea fishing around and off the coast of the RBD. Popular bird and wildlife watching areas are present within the RBD, including Skomer Island and the 700ha Ynys-hir Nature Reserve in the Dyfi Estuary.

These water and land based recreational resources can contribute to enhancing the quality of people's lives and human health. They also provide economic benefit.

Future baseline – what recreation and tourism services are likely to be provided in future in the absence of the plan?

In the absence of the plan, it is anticipated that the recreation and tourism service will change and develop through time, influenced by projects and strategies to develop certain areas of the RBD.

In the longer term, climate change may increase the vulnerability of particular recreational and tourism assets to flooding. As already covered in the assessment of cultural heritage services, the predicted increase in rainfall and the intensity and frequency of storm events could result in more severe and frequent flood events affecting the RBD's historic coastal and riverside towns and other heritage assets. Many of these towns are important centres for recreation and tourism, attracting visitors within the area as well as nationally.

Prolonged and more frequent flooding could adversely affect the local tourism economy due to disruption, the costs of repair and a possible decline in visitor numbers due to negative images in the press.

What is the change in benefits to this service predicted through the Western Wales FRMP?

The key measures resulting in potential effects to the recreation and tourism service in the RBD are construction works associated with the maintenance, repair and improvement of existing structures, and the construction of new flood risk management schemes from the initial assessments and inspections. Where these are situated within communities and settlements with recreation and tourist assets such as Aberystwyth, Porthmadog or Pembrey, they may lead to a negative, short-term effect on the recreation and tourism service within the RBD. This effect will be due to potential disruption to public access and rights of way, restriction of the use of playing fields or restrictions of access to the riverbank for recreational fishing, closures or restrictions to other recreation facilities and also to tourist attractions. This short-term effect will generally be reversible upon completion of construction assuming good environmental design. However, there could be a long-term, negative effect in these areas where new schemes or structures are required that might impact heavily on the current landscape, environment and its use for recreation and tourism.

Overall, it is anticipated that as a result of the plan there will be a minor negative effect on the recreation and tourism services provided within the Western Wales RBD. Effects will largely be confined to the communities where actions are to be implemented as shown in Figure 4.5. The implementation of flood alleviation schemes could have negative effects where their location or design would serve to limit access to a watercourse or hinder its use for water-based activities (e.g. boating, canoeing). There is also the potential for new schemes and increasing the standard of protection of existing flood defence assets to impact visually on the surrounding landscape and townscape of places that are valued for their aesthetic qualities. The managed realignment, removal or non-maintenance of existing raised defences could impact on the Public Rights of Way network, including long distance footpaths such as the Wales Coast Path. Reductions in the intensity of maintenance operations could also have negative consequences for the aesthetic appeal and attractiveness of watercourses that become overgrown, making them unsuitable for water-based activities. Lastly the replacement or alteration of existing flood defence assets (e.g. tidal and river gates) may also lead to changes in water levels and flows that could potentially impact on the use of a watercourse for recreational activities such as boating or sailing.

In order to mitigate for this potential effect, works must be designed appropriately for the local area, with finishes and working methods agreed with the appropriate governing bodies. There is an opportunity to mitigate these effects and enhance local communities through good environmental design. The creation of more natural and attractive riverine environments (e.g. aesthetic services) is likely to encourage more water-based recreational activities and informal leisure pursuits such as walking and bird watching. Changes in maintenance regimes such as dredging, is likely to improve fish habitats and the recreational fishing resource of watercourses. Opportunities for managed realignment and the creation of intertidal habitat through the NHCP will also further enhance the area's attraction for bird watching.

More generally, as already outlined in the assessment of cultural heritage services, the local tourism economy may benefit from the reduced risk of flooding of the historic coastal and riverside towns in the RBD and other heritage assets. This a consequence of the implementation of flood alleviation schemes, improvements to existing flood defence assets and wider catchment measures for regulating water.

How significant are the predicted changes to recreation and tourism services in the Western Wales RBD?

Implementation of the Western Wales FRMP is not anticipated to have a significant effect on the recreation and tourism service in the RBD, however there is anticipated to be a minor, negative effect to the recreation and tourism service overall. The main parties subject to this negative effect will be the users of and visitors to the rivers, lakes and estuary, as there will potentially be an altered landscape and recreation provisions. Good environmental design and liaison with local user groups should aim to mitigate impacts and deliver enhancements to this service where possible. The tourist industry will benefit from reduced flood risk indirectly, due to reduced disruption and business losses.

The indirect and cumulative effect of the improvements to the recreation and tourism service are outlined in Section 3 below.

6. Aesthetic Value (e.g. landscape, seascape, tranquillity)

What are aesthetic value services?

Many people find beauty or aesthetic value in various aspects of ecosystems, as reflected in the support for parks and scenic drives and in the selection of housing locations.

What is the current baseline in this service in the Western Wales RBD?

The landscape of the RBD varies considerably from the mountains and lakes of Snowdonia and the estuaries of the mid-Wales coast, to the beaches and cliffs of Pembrokeshire, and the industrial heritage of the South Wales Valleys.

There are substantial areas of the RBD (65,926ha) designated as Areas of Outstanding Natural Beauty (AONBs) which is approximately 4% of the RBD. These include the Llŷn

Peninsula, Gower, Anglesey and part of the Clwydian Range. Approximately 500km of the Welsh Coast is designated as a Heritage Coast. Three National Parks (Brecon Beacons, Pembrokeshire and parts of Snowdonia) cover an area of 287,830ha of the RBD, which is approximately 17% of the RBD. The Brecon Beacons were awarded international dark sky status in February 2013, one of only 5 places in the world to hold this designation.

Future baseline – what aesthetic value services are likely to be provided in future in the absence of the plan?

In the absence of the plan, management of the sensitive landscapes is likely to continue to improve their quality and thus the aesthetic value services they provide. However, in the lowlands, there is a greater risk of changes to the landscape and to visual amenity through commercial, residential and industrial developments.

What is the change in benefits to this service predicted through the Western Wales FRMP?

Key measures resulting in potential effects to the aesthetic value service in the RBD include:

- Construction works associated with the maintenance, repair or improvement of existing assets across the RBD cause a negative, short-term effect on the local landscape and waterscape; and
- Initial assessments leading to future construction would could have a potential short-term negative effects are anticipated from future works carried out as a result of the feasibility studies due to the disturbance of the landscape from construction activities. Also, where larger, or more visually intrusive structures are placed in landscape sensitive areas such as the Conservation Areas within the towns this could cause a more long-term, negative effect and dependent upon the scale cause a material change to the landscape character of the area.
- Managed realignment and the removal or setting back of defences and associated habitat creation also has the potential to create a more natural appearance. In some instances, however, raised flood embankments may be an established part of the local landscape and link to other services such as recreation and tourism where part of long distance footpaths (e.g. Mawddach Trail). Reductions in the intensity of

maintenance regimes could also improve the aesthetic appeal of a watercourse by facilitating habitat establishment and a more naturalised and diverse appearance. The replacement/refurbishment of existing flood risk assets may provide the opportunity for designs (e.g. scale, materials, landscaping) to better reflect the local context.

In the assessment it is recognised, however, that many changes to this service are subjective and dependent upon the nature of the receptor and the value placed in certain landscapes.

Overall, it is anticipated that as a result of the plan there will be a minor negative effect on the aesthetic value services provided within the Western Wales RBD. Effects will largely be confined to the communities where actions are proposed as shown in Figure 4.6. To mitigate any potential adverse impacts, any works within or in close vicinity to a designated landscape will require early engagement with the local planning authority or conservation board. Where actions are likely to involve physical interventions (e.g. flood storage basins, built structures, raised embankments) a visual and landscape character impact assessment may be necessary to help inform the project design. National Park and AONB management plans and landscape character studies can be used to help identify opportunities for partnership working and to inform project development and design.

How significant are the predicted changes to aesthetic value services in the Western Wales RBD?

Implementation of the plan is not anticipated to have a significant effect on the aesthetic value services in the RBD, however there is anticipated to be a minor, negative effect to the aesthetic value services overall, confined to the specific areas where actions are proposed. The main parties subject to these effects will be the users of and visitors to the rivers, lakes and estuary, as well as residents and businesses within the communities. The indirect and cumulative effects of the improvements to the aesthetic value service are outlined in Section 3 below.

Figure 4.6: Distribution of potential effects to aesthetic value service within the Western Wales RBD



7. Provision of Habitat (Biodiversity)

What are habitat services?

Habitats provide everything that an individual plant or animal needs to survive: food; water; and shelter. Each ecosystem provides different habitats that can be essential for a species' lifecycle. Many species of bird, fish, mammal and insect rely on different ecosystems during migration.

What is the current baseline in this service in the Western Wales RBD?

The RBD supports varied wetland wildlife and the importance of wetland habitat is reflected by the number and variety of international, national and local nature conservation designations. Approximately 70% of the Welsh coastline is designated as either Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites, with a range of habitats such as coastal saltmarsh, grazing marsh, mudflats, reed beds, cliffs, dunes and shingle.

Management of the coast including shoreline reinforcements, flood defence, drainage, and land reclamation have threatened coastal habitats and create challenges for future management.

Of the European designations present in the RBD, 60 of the Special Areas of Conservation (SACs) and 12 of the Special Protection Areas (SPA) within the RBD are water dependent. Many of the Sites of Special Scientific Interest (SSSIs) within the RBD also have close links with the water environment.

For each of these European Sites, Natural Resources Wales is in the process of reviewing Conservation Objectives aimed at ensuring the sites achieve favourable conservation status.

The RBD contains many rivers that support salmon and trout (498 Freshwater Fish Waters), and the rivers of Wales account for more than half of the Sea Trout caught in England and Wales. As well as fish, water bodies and wetland areas within the RBD

support a number of protected species (such as Otters, whose population is increasing in number across Wales) and also priority species listed in the UK Biodiversity Action Plan (such as Allis and Twaite Shad, Water Voles, Freshwater White-clawed Crayfish and Depressed River Mussels). Invasive species in the RBD include Japanese Knotweed, Himalayan Balsam and North American Signal Crayfish.

Offshore, parts of the marine environment are designated within the Marine Protected Areas network. Marine Protected Areas incorporate different levels of protection and include SPAs, SACs and SSSIs with marine components, as well as Marine Nature Reserves (Skomer and Lundy Islands).

Future baseline – what provision of habitat services are likely to be provided in future in the absence of the plan?

In the absence of the plan, climate change will place increasing pressures on this service, however, the provision of habitat services are likely to improve gradually over time associated with other initiatives and legislation targeted at environmental improvements and resilience to climate change.

The existing defences around the coast of Western Wales are predicted to cause coastal squeeze of intertidal habitat as sea levels rise. This will have significant effects on features of European designated sites. The SMP2s quantified the predicted losses of habitat and were accompanied by Statements of Case that concluded there were no better alternatives, that there is a case of overriding public interest and then outlined a proposed compensatory package. The compensatory packages are being delivered by the National Habitat Creation Programme (NHCP). The aim is to compensate for the loss of habitat before it occurs and coastal Flood Alleviation and NHCP projects will be delivered in line with the SMP2 policies and have project level Habitat Regulations Assessment. It is not the intention to revisit or replicate the HRA's undertaken for the SMP2s.

Within the short term (epoch 1 or up to 2025), through planned delivery of habitat creation projects, the NHCP is on target to create sufficient habitat to ensure full compliance with

the Habitats Regulations and the Water Framework Directive. Candidate land areas for future managed realignment are also undergoing a process of appraisal by NRW.

What is the change in benefits to this service predicted through the Western Wales FRMP?

Key measures resulting in potential effects to the provision of habitat service in the RBD include:

- Works to maintain, repair or improve existing assets across the RBD could result in clearance of small amounts of vegetation, leading a short-term negative effect on this service.
- Dredging works to improve conveyance of channels will affect fish habitats through potential mortality and reductions in geomorphological diversity, leading to a short-term negative effect until habitats re-establish to a natural condition.
- Dredging assessments, to assess the suitability of dredging channels may result in alterations to dredging regimes and lead to a positive, long-term effect on the provision of habitat service.
- Initial assessments, potentially leading to physical construction works could lead to a short-term, negative effect due to any future scheme resulting in a direct loss of habitat, however there is a potential long-term, positive effect where reduced flood risk and fewer flood events minimise disturbance to local species and habitats.

The development of new flood alleviation schemes could result in the direct loss of bank-side and in-channel habitats, including fish spawning areas. Maintenance activities, such as dredging, could also negatively impact fish habitat by reducing the morphological diversity of the channel and increasing sedimentation. The refurbishment/replacement of existing flood defence assets will, however, provide the opportunity to improve fish and eel passage in order to comply with European Directives

The implementation of flood alleviation schemes and improvements in the standard of protection of existing flood defence assets could result in the loss of habitat through land-take as well as modifying the natural form and functioning of watercourses with consequent impacts on habitat diversity for fish and other protected species (e.g. water

voles). The development of new schemes and the introduction of SuDs and flood storage basins could also lead to changes in the hydrological regime of water dependent habitats in the surrounding area. The implementation of measures, such as SuDs and flood storage basins, however, could also incorporate habitat creation and enhancement as an integral part of the scheme design.

Overall, it is anticipated that as a result of the FRMP there will be a minor negative effect on the provision of habitat services provided within the Western Wales RBD. Effects will be felt across primarily within the areas surrounding the communities where actions are to be implemented as shown in Figure 4.7.

To mitigate for the potential negative effects on this service, appropriate ecological survey work would be undertaken to influence the design of schemes and the land-take and habitat loss as a result of any scheme is to be minimised through careful siting of elements. Enhancement planting is also to be provided to mitigate for habitats lost to ensure no net loss.

How significant are the predicted changes to provision of habitat services in the Western Wales RBD?

Implementation of the Western Wales FRMP is not anticipated to have a significant effect on the provision of habitat services in the RBD, but a minor negative effect. The main parties subject to this effect will be the habitats and species within the RBD with potential reductions in species diversity and habitat cover, and also the users of and visitors to the rivers, lakes and estuary, as there may be a less naturalised landscape with reduced vegetation and tree cover. The indirect and cumulative effects of the improvements to the aesthetic value service are outlined in Section 3 below.

The likely effects of the plan on features of the European designated sites within the RBD will be assessed under the Habitats Regulations and will be documented in a separate Habitats Regulations Assessment. It is good practice to undertake this iteratively with the plan development. It is therefore proposed that we will undertake the HRA in conjunction with the current consultation period.

Assessing effects on supporting services

Supporting services underpin the delivery of all other ecosystem services. They include the formation of soils, the cycling of nutrients and water, biodiversity and the provision of habitat. The National Ecosystem Assessment notes that these services are strongly interrelated and are underpinned by a vast array of physical, chemical and biological interactions. Our understanding of these interactions and their influence on supporting services is limited, particularly when considered at a wider scale.

The assessment had identified that these supporting services are likely to be influenced by the flood risk management plan. However, there is a great deal of uncertainty as to the likely scale and therefore the significance of these effects. We have therefore provided an oversight of the likely effects in this section without attempting to assign any significance to these. The one exception to this is the provision of habitat. As the creation and improvement of habitats within the water environment can be affected by flood risk

management activities we have addressed this within the section on the assessment of significant effects.

Soil formation

Soil formation in the UK is a long term process, taking place over decades and centuries. The National Ecosystem Assessment identifies that the main drivers of change in soil formation and associated threats in the UK are land use, climate change and urbanisation. In the last 50 years, UK agricultural soils have been subject to significant change. The flood risk management plan could promote land management measures such as new planting of trees. Significant tree planting on agricultural land could influence soil formation because trees root deeper and accumulate litter and organic matter at the surface, with likely consequences for physical properties and nutrient cycling.

Nutrient cycling

Nutrient cycling refers to the uptake, use, release and storage of nutrients by plants and their environments. The National Ecosystem Assessment noted that the most dramatic trend in nitrogen cycling over the last 50 years has been the enrichment of UK terrestrial habitats with nitrogen due to the application of fertiliser nitrogen in managed land and atmospheric nitrogen deposition in semi-natural systems. Increasing the availability of nutrients can affect the composition and diversity of plant communities, favouring those plants that are fast growing and able to take advantage of the additional resource. The flood risk management plan will have little interaction with either source.

Primary production

Primary production is focused on the formation of biological material by fixing carbon dioxide through photosynthesis and the assimilation of nutrients. The production of food and fibre and the developments that have resulted in increases in yields over the last 150 years are considered to be the main influence on primary production. The addition of nutrients has been successful in increasing primary production for food crops. However, there have been detrimental effects, particularly where this affects water bodies, their water quality and species composition. In some cases eutrophication occurs affecting fish, shellfish and invertebrates in rivers, lakes and marine environments.

The flood risk management plan includes measures that promote river restoration and reconnection of rivers to their floodplains that can reduce the extent to which nutrient enrichment of agricultural land is washed into rivers. This will have the benefit of

supporting more efficient use of nutrient enrichment for food and fibre provision, while reducing the adverse effects on the water environment.

Water cycling

As supporting ecosystem services, water cycling the major water flows (rainfall, evapotranspiration, river flow) and water storage (soil, groundwater, lakes) that combine to determine the availability of water. Human activity has a significant influence over the water cycle through land use, drainage, impounding water, changing the structure of rivers (particularly associated with flood risk management) and abstracting water. The effects of these activities are likely to be exacerbated by climate change, population growth and associated increased urbanisation. These will increase competition for a limited resource, particularly during the predicted dryer summers associated with climate change.

Conflicts in water resource management are common and managing flooding is one such conflict. Flood defences that involve engineered structures can disrupt the water cycle by disconnecting the river from its flood plain, whilst measures that restore rivers and natural processes will help to ensure that water is available to support the provision of other ecosystem services.

Indirect and Cumulative Effects

As the natural environment and all the ecosystem services are intrinsically linked, each cannot be considered in isolation and indirect and cumulative effects are caused. An indirect effect arises where one effect of the plan has a subsequent effect on another ecosystem service and a cumulative effect arises, for instance, where several plans, policies and programmes each have insignificant effects, but together have a significant effect; or where several individual effects of the plan have a combined effect.

The cumulative effects of SMP2 and CFMP policies with the proposed measures set out in the FRMP was considered in the Appraisal Summary Tables, however, as the proposed measures were all in line with the more strategic policies of the CFMPs and SMP2s there were no significant effects. The draft Western Wales RBMP is being consulted on alongside the Western Wales FRMP. The RBMP proposes a programme of measures to improve the water environment. Flood risk management measures can have both positive

and negative interactions with the water environment. The synergies and conflicts have been discussed in further detail below.

The alignment of, and cumulative effects of, the Western Wales FRMP with other plans, policies and programmes is considered in Chapter 3.

The indirect effects of the plan are considered below:

- A negative effect on the food service in the RBD could reduce the ability of the RBD to provide primary production services and photosynthesis services through reductions in extent of cropped areas.
- A positive effect to the water regulation service will lead to less risk of erosion and thus a greater erosion regulation service; less risk of contamination from flooding and thus a greater water purification and waste treatment service; less risk of damage to productive agricultural land and loss of crops, so increasing the food production service;
- A positive effect on the soil and erosion regulation service may lead to more soil formation in the RBD and more productive soil so a cumulative positive effect on the provision of habitat and food services would be anticipated;
- A negative effect to the cultural heritage service through physical damage or degradation of setting of heritage assets may result in decreases in visitor numbers to assets and thus a minor negative effect to the recreation and tourism service in the RBD;
- A negative effect to the aesthetic value service is anticipated to cause an indirect negative effect to the recreation and tourism service, through affected views, less vegetation cover and modified water environments attracting fewer visitors to the RBD through a degraded recreational resource of the water environment for users. It is also anticipated to cause a negative effect to the cultural heritage service through potential deterioration to the setting of heritage assets;
- A negative effect in the provision of habitat service will reduce the extent, value and diversity of habitats and species across the RBD, which will affect landscapes, visitor numbers to the area, carbon storage potential and protection from soil

erosion. This will affect a number of ecosystem services, notably aesthetic value, recreation and tourism, climate regulation and erosion regulation.

Western Wales River Basin Management Plan

The FRMP has been developed in parallel to, and has taken account of, the draft update to the Western Wales RBMP, which proposes a programme of measures to improve the water environment. There are 814 water bodies across the RBD comprising rivers, coastal waters, lakes, groundwater and estuaries. In 2009, 29% of the water bodies were at “good” status, this rose to 35% in 2013. Significant water issues identified for the Western Wales River Basin District are: Physical modifications, pollution from sewage and waste water, pollution from towns, cities and transport, pollution from rural areas, pollution from mines and invasive non-native species.

Flood risk management measures can have both positive and negative interactions with the water environment. Flood risk management measures which work with natural processes to help slow flow and store water tend to have beneficial effects on the water environment, whereas measures that involve building defences or artificially regulating water tend to have adverse effects on the water environment. Flood risk management is one of the top ten reasons a water body fails to meet the objective set under the WFD in Wales. This is why it is important to ensure that where action is needed to manage the risk of flooding, an option is selected that does not lead to further deterioration of the water environment but instead seeks opportunities for improvement and delivers joint benefits.

Given the strategic nature of the FRMP and its broad scale we have not carried out a detailed WFD assessment of individual flood risk management measures as this will be undertaken at the project level when more certainty is available on the flood risk management measure type and location. However, broad consideration has been given to whether the FRMP and the RBMP are in conflict or there are synergies in their effects on ecosystem services considering the specific actions proposed in both plans, which is provided in Table 4.1.

Table 4.1: Synergies and conflicts between the Western Wales FRMP and Western Wales RBMP

Ecosystem Service	RBMP and FRMP synergy or conflict
Food (e.g. crops, fruit, wild collected food)	Where flood risk is reduced in the RBD through the FRMP, there is a potential opportunity to encourage riparian zone management and sustainable land management from the RBMP to maximise yields of agricultural land.
Fibre and fuel (e.g. timber & wool)	No potential synergies with the RBMP for this service have been identified, however the FRMPs will contribute to the maintenance of the service in the RBD through reduction in flood risk and associated damage.
Water for non-consumptive use (e.g. Hydropower, navigation)	The RBMP may cause a reduction in the water for non-consumptive use service in the RBD, with weir removal and alterations to dredging regimes, so there is a potential cumulative effect with the FRMP as it may also potentially reduce navigation ability through changes to the dredging regime. Also, the construction of weirs for FRM purposes, as they could be barriers to fish passage, conflicts with the aims of the WFD. Any weirs must have suitable fish passage provision designed into them.
Air Quality regulation	There are potential short-term minor effects from FRMP measures, which could affect this service and thus also indirectly affect water quality and the objectives of the RBMP.
Climate regulation	The FRMP's positive effects on climate regulation is likely to contribute to a range of WFD objectives and provide a cumulative positive benefit to the water environment with the RBMP
Water regulation (e.g. flooding)	Land management in the upstream catchments could provide FRM benefits through increasing the storage capacity of the RBD, providing a synergy with the FRMP and reducing the flood risk to the downstream areas of the RBD and the identified communities at risk.
Soil & Erosion regulation	The RBMP will drive improvements to this service, predominantly in the upland catchments however, so distant from the areas of proposed works. However, with the measures proposed in the FRMP and RBMP, there is the potential for a RBD-wide benefit to this service.

Water purification and waste treatment	There is a conflict here with the RBMP, as the primary driver of the RBMP is to deliver water quality improvements. The FRMP will primarily drive reductions in catastrophic contaminant / pollutant release occurrences from flood events, so will work towards improved water quality overall but construction could cause negative effects.
Cultural heritage	There is the potential for a cumulative effect with the RBMPs as they will both involve construction works across the RBD that could potentially damage the cultural heritage resource. Appropriate management must be implemented at an early stage to protect this resource.
Recreation and tourism (accessible blue & green space)	There is the potential for cumulative positive effect from the FRMP and RBMP actions on outdoor recreation, through improvements to access infrastructure and improvements to the naturalness and visual appearance of river channels.
Aesthetic value (e.g. landscape, seascape, tranquillity)	With appropriate design of schemes within the FRMP and RBMP, improvements to the landscape could be delivered in the wider RBD centred around the water courses of the RBD. Where RBMP measures are proposed along channels within the settlements, there could be opportunities for partnership working.
Provision of habitat	Enhancements delivered through FRMP actions should consider RBMP measures and requirements of the WFD water bodies to achieve Good Ecological Status.

Measures proposed in the draft Western Wales RBMP that are primarily in conflict or synergy with the FRMP are as follows:

Synergies

- **Improvements to fish passage and habitat** – FRMP works to culverts could potentially improve fish passage and habitat; and
- **Manage invasive non-native species** – FRMP works would involve treatment of invasive species.
- **Sustainable access and recreation management** – FRMP works could improve access to river.
- **Mitigate impacts of flood and coastal defences** – FRMP works may involve upstream storage and removal of hard-bank infrastructure;

Conflicts

- **Sustainable agricultural practices** – FRMP works involving agricultural land take could compromise achievement of implementation of sustainable agricultural practices through reduced availability of land for buffer strips for example;
- **Improve fish passage and habitat** – FRMP works may involve construction of hard-bank infrastructure affecting fish habitat, and dredging works could affect fish habitat and cause fish mortality;
- **Mitigate impacts of flood and coastal defences** – FRMP works may involve construction of hard-bank infrastructure affecting achievement of this objective;
- **Address air pollution** – FRMP works may cause short-term emissions leading to effects on air quality;
- **Appropriate coastal process and sediment management** – FRMP works may involve construction of hard-bank infrastructure affecting sedimentation processes;
- **Drainage and water level management** – FRMP works may temporarily raise or lower water levels depending upon requirements leading to a negative effect, or may increase channel capacity; and
- **Fisheries management** – FRMP works will need to have fish passage provision.

Summary of Effects

Overall, the plan will have both positive and negative effects on the environment and is anticipated to have the effects on a number of specific ecosystem services:

Provisioning Services

- Food (e.g. crops, fruit, wild collected food)

Regulating Services

- Water Regulation (e.g. flooding)
- Soil and Erosion Regulation

Cultural Services

- Cultural Heritage
- Recreation and Tourism (including accessible blue and green space)
- Aesthetic Value (e.g. landscape, seascape, tranquillity)

Supporting Services

- Provision of Habitat (e.g. Biodiversity)

The negative effects will largely result from actions that will involve construction on agricultural land, on existing habitats or in settlements. These areas can contain sensitive landscapes and heritage assets and can also provide recreation and tourism services which will be disturbed by construction. The beneficial effect on water regulation will largely come from focussing on activities specifically to regulate water in the RBD. The effects of the plan are summarised in Table 4.2.

These effects to the ecosystems services provided within the RBD will have a range of cumulative and indirect effects. The cumulative effects with other plans, policies and programmes are assessed above, and the anticipated indirect effects are also provided in Table 4.2.

Table 4.2: Potential direct and indirect effects of the Western Wales FRMP

Ecosystem Service	Effect of Western Wales FRMP	Indirect Effect of Western Wales FRMP
Food (e.g. crops, fruit, wild collected food)	Minor Negative	Minor negative on primary production and photosynthesis
Water Regulation (e.g. flooding)	Minor Positive	Positive effect on erosion regulation, water purification and waste treatment and food services
Soil and Erosion Regulation	Minor Positive	Positive effect on food and soil formation services
Cultural Heritage	Minor Negative	Negative effect on recreation and tourism
Recreation and Tourism (including accessible blue and green space)	Minor Negative	No indirect effects anticipated

Aesthetic Value (e.g. landscape, seascape, tranquillity)	Minor Negative	Negative effect on recreation and tourism, and cultural heritage services
Provision of Habitat (e.g. Biodiversity)	Minor Negative	Negative effect on aesthetic value, recreation and tourism, climate regulation and erosion regulation

Cumulative effects with the draft Western Wales RBMP have also been considered, with the FRMP potentially influencing the delivery of the following RBMP measures:

- Improvements to fish passage and habitat
- Manage invasive non-native species
- Sustainable access and recreation management
- Mitigate impacts of flood and coastal defences
- Sustainable agricultural practices
- Improve fish passage and habitat
- Mitigate impacts of flood and coastal defences
- Address air pollution
- Appropriate coastal process and sediment management
- Drainage and water level management
- Fisheries management

Summary of Mitigation

For the potential negative effects identified in the above assessment sections, the following mitigation is proposed to avoid or reduce these negative effects:

- For the Food service, to mitigate for potential negative effects on this service, the following mitigation should be implemented: Site works away from highest grades of agricultural land (i.e. Grade 1 or 2 ALC land); Inform and engage with affected landowners to minimise potential effects; and Ensure appropriate fish passage, improvements to fish habitats and fish-rescue provisions are developed when undertaking in-river works to ensure the food service in the RBD is maintained.

- For the Cultural Heritage service, to mitigate for the potential negative effects, a cultural heritage assessment of any intrusive works should be undertaken, maximising use of local knowledge, prior implementing the relevant measure. This will ensure all effects on the archaeological or built heritage resource are managed appropriately;
- For the Recreation and Tourism service, in order to mitigate for this potential effect, works must be designed appropriately for the local area, with finishes and working methods agreed with the appropriate governing bodies and consideration given to enhancing the area around the settlements for recreational purposes;
- For the Aesthetic Value service, to mitigate for the effects works must be designed appropriately, with finishes, working methods and visual effects considered at an early stage. Also consideration should be given to the local landscape character of the town and surrounding area; and
- For the Provision of Habitat service, to mitigate for the potential negative effects, appropriate ecological survey work would be undertaken to influence the design of schemes and the land-take and habitat loss as a result of any scheme is to be minimised through careful siting of elements. Enhancement planting is also to be provided to mitigate for habitats lost to ensure no net loss.

In addition to these service-specific mitigation measures, presented below are additional safeguards to ensure that the environmental implications are addressed in related future implementation 'decision making' processes:

- SEA will be undertaken for plans and strategies developed by risk management authorities. This process will also identify local opportunities to integrate environmental benefits into proposed flood risk management solutions.
- Existing plans have their own governance structures which embed further environmental appraisal. For example, any modifications to shoreline management plans will go through an agreed change process which includes an environmental assessment.
- Environmental impact assessment will be undertaken on projects that are likely to have significant environmental effects.

- Strategic flood risk assessments are produced by local planning authorities. These provide advice on flood risk within the local authority in order to influence decisions on the location of development and the incorporation of measures to avoid exacerbating flood risk, such as the use of SUDS.
- If potential adverse effects are identified and cannot be avoided, scheme specific mitigation will be developed to minimise effects in consultation with the relevant organisations. The following will also be applicable at the project level:
 - 1) Environmental impact assessment will be undertaken on projects that are likely to have significant environmental effects.
 - 2) Habitats regulations assessments are undertaken to determine whether a proposed, plan, strategy or scheme is likely to adversely affect the integrity of a European designated site.
 - 3) Assessment of potential implications for nationally designated sites, areas and landscapes (e.g. SSSIs, AONBs, National Parks, World Heritage Sites), including their setting.
 - 4) Water framework directive assessments are undertaken to assure compliance with WFD objectives where this is feasible.

5. Monitoring the effects of the plan

This section sets out the monitoring that we propose to understand the significant effects of the plan in practice. The water environment is subject to considerable monitoring activity by the NRW and others and so we propose an approach that takes advantage of this existing activity.

Measures are required to monitor the significant effects that the flood risk management plan is having on the environment. The indicators have to be practical, cost-effective and strategic, and must inform on the effects of the plan itself, rather than on wider trends. The proposed indicators reflect the effects identified as significant by the SEA process and are set out in table 5.1. Effects of significant individual projects will be monitored according to environmental action/monitoring plans devised during project level environmental impact assessment.

Table 5.1 Proposed sources of information for monitoring significant effects on the environment.

SEA Receptor	Proposed Monitoring Indicator	Source
Water	No additional monitoring proposed	Existing monitoring of water body status and through River Basin Management Plan requirements
Population and human health	No additional monitoring proposed	NRW - Angling Numbers - Rod licences sold User numbers for coastal path & visitors to National Nature Reserves (visitor counters at certain locations) Visitor numbers to National Parks (NPA)
Biodiversity, flora and fauna	Monitoring of capital project habitat delivery will be undertaken and feed in to the NHCP reporting.	Existing monitoring of aquatic inverts and fish through River Basin Management Plan requirements. Annual reporting to WG of the progress of the National Habitat Creation Programme
Cultural heritage	Status of listed and non-listed historic and archaeological features to be monitored at individual project level.	Cadw, Welsh Archaeological Trusts

6. What happens now?

This section sets out how to respond to this Environmental Report that accompanies the draft FRMP. It provides the questions to prompt in your response to this consultation on the Environmental Report. It also sets out the next steps in the Strategic Environmental Assessment process to the publication of the final FRMP.

This Environmental Report has been published with the Western Wales FRMP on 10 October 2014 and is available for consultation for a six month period. Consultation will close on 31 January 2015. In seeking your views on this Environmental Report we have set out some specific consultation questions provided below:

1. **Do you agree with the conclusions of the environmental assessment? (yes / no)**
 - a. **If not, please explain why.**
 2. **Are there any further significant environmental effects of the draft plan which you think should be covered by this assessment? (yes / no).**
 - a. **If yes, please describe what they are.**
 3. **As part of the environmental report, we have set out mitigation measures for addressing any significant negative effects on the environment, as well as opportunities to deliver positive effects on the environment.**
 - a. **Are there further mitigation measures or opportunities for improving the environment that we should consider for the plan? (yes / no)**
 - b. **If yes, please give details.**
-

How to respond

Natural Resources Wales would prefer you to respond to this consultation by email at:

Flood.risk.management.plan@naturalresourceswales.gov.uk

This will allow you to make your comments more effectively, while helping us to gather and summarise responses quickly and accurately. However, if you want to respond in another way, please contact the NRW customer contact centre on 0300 0653000.

Please return written responses by 31 January 2015 to:

Rachel Sion

Natural Resources Wales
29 Newport Road
Cardiff
CF24 0TP

Next steps

The FRMP sets out how we will continue to develop the plans:

- taking into account new information;
- refining the cost benefit analysis; and
- taking into account responses to this consultation.

As the plan evolves we will consider any implications this might have for effects on the environment as part of our strategic environmental assessment requirements. The adopted FRMP will be published in December 2015. This will be accompanied by a Statement of Environmental Particulars which will provide:

- Summary of how environmental considerations have been integrated into the plan.
- Summary of how consultation responses to the draft plan and environmental report have been taken into account (with cross reference to the detailed consultation response report)
- Summary of how the plan has changed since the draft plan and what this means in terms of changes to the environmental effects that were reported in the environmental report.
- The reasons for choosing the plan as adopted in the light of alternatives.
- The measures to be adopted to monitor the effects of the plan.

Annex A: Plans, policies and programmes reviewed for the SEA

Background

SEA requires a good understanding of the strategic and policy context of the Flood Risk Management Plan (FRMP), in order to identify areas of mutual influence and tension with other policies plans and programmes (PPPs) and to contribute to development of the environmental baseline. This helps ensure the FRMP is robust, realistic and SEA Directive compliant.

This information needs to be included in the Environmental Report, whose required contents are set out in Annex I of the SEA Directive and are extracted below followed by interpretive official guidance:

Annex I (a) requires:

“An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes.”

EC guidance: Information on the relationship with other relevant plans or programmes sets the plan or programme in a broader context: it might, for instance, concern its place in the stage of decision-making or its contribution amongst other plans or programmes to changes in the environmental conditions of a certain area. Relevant plans or programmes can thus be those at other levels in a hierarchy which the actual plan or programme forms part of or they can be those drawn up for other sectors affecting the same or adjacent areas.

Annex I (e) requires identification of:

“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.”

EC guidance: The environmental protection objectives to be dealt with should cover at least the issues listed in paragraph (f)⁶. International and Community objectives are often incorporated in objectives on national, regional and local levels and these could often be sufficient for this purpose. It should be noted that the paragraph concerns objectives that are relevant to the plan or programme, which would imply relevant to its likely significant effects or to issues it raises.

1.2 Methodology

A list of relevant PPPs for review was developed by Natural Resources Wales, based on an initial list set out at the scoping stage and modified following consultation. This prioritises relevant national and regional PPPs. It is a significantly shorter list than usual for this element of SEA and thereby follows the EC guidance above regarding (a) implicit or explicit incorporation of international and EC environmental objectives in national and regional plans and (b) consideration of PPP relevance, bearing in mind the significance of effects around a particular environmental receptor. Local Authority plans were reviewed to extract key spatial planning information with a focus on likely land use of significance at the level of the FRMP. Each PPP was reviewed to identify any relevant links with the draft Plan. PPPs which could operate as drivers for delivery of the objectives of the Flood Directive were highlighted.

A summary of relevant PPPs that were reviewed is presented in Section 2 below and these fall under the following topics:

- Water (water resources, water companies, flooding and coastal erosion);
- Spatial Planning / Population
- Biodiversity
- Recreation
- Geology, Soils and Agriculture
- Material Assets (e.g. transport)

⁶ (f) *the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.*

- Waste
- Climate
- Landscape
- Cultural Heritage

The objective was to focus on the most relevant PPPs. Each entry in the summary table below is extracted from a more detailed review of each of the documents listed. The more detailed assessment compiled the following information:

- The title, author and publication date of the specific PPP being reviewed;
- Whether the PPP could assist in the delivery of the FRMP;
- A summary of the aims, objectives and issues within the PPP that were considered to be relevant to the draft Plan;
- A discussion of any influence the PPP could have on the draft Plan;
- A discussion of any influence the draft Plan could have on the PPP;
- A discussion of how the PPP should be factored into the SEA process.

Summary of review of relevant PPPs

Title, author, date	Objectives	Areas of synergy and conflict with respect to the RBMP
National PPPs		
<i>Water</i>		
Welsh Government (2011) Understanding the risks, empowering communities, building resilience: The national flood and coastal erosion risk management strategy for Wales	Provides the national framework for flood and erosion risk management setting out four overarching objectives: <ul style="list-style-type: none"> • reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion • raising awareness of and engaging people in the response to flood and coastal erosion risk; 	The policy is aligned with the aims and objectives of the FRMP; recognising the importance of engaging with communities and working in partnership for effective flood risk management. The implementation of the FRMPs will help to deliver the policy's objectives for a flood and erosion risk management strategy across Wales.

	<ul style="list-style-type: none"> • providing an effective and sustained response to flood and coastal erosion events; • prioritising investment in the most at risk communities. 	
Welsh Government (2011) Strategic Policy Position on Water	<p>Provides Ofwat, the water companies, regulators and other interested parties a clear steer on the Welsh Government's priorities for water.</p> <p>Highlights areas that will be a priority in the future including drinking water quality, protecting the environment and secure supplies and improving resilience.</p>	The FRMPs are largely aligned with this policy, in promoting a safe and sustainable water environment. However the FRMP's must ensure that water quality and availability is not compromised through management of flood risk.
Welsh Government (2007) Making the Most of Wales' Coast: The ICZ Management Strategy for Wales	Concerned with managing coastal resources in Wales in an integrated and informed way, ensuring that these assets are maintained and enhanced for the benefit of present and future generations.	The strategy aligns with the FRMPs by providing a holistic framework for managing the coastline, including protection of the coastline and further inland from coastal flooding. This will be done whilst also providing other socio-economic and environmental improvements to maximise the potential of Wales' coastline.
<i>Spatial Planning / Population</i>		
Welsh Government (2012) Planning Policy Wales (including Technical advice Notes: Nature Conservation and Planning, Design, Tourism, Development and Flood Risk, Transport, Waste, Renewable Energy, Coastal Planning)	Sets out the land use planning policies of the Welsh Government and key policy objectives for Local Development Plans (LDPs) in Wales, both reflecting the sustainable development agenda	The FRMP's will assist in the achievement of wider Planning Policy Wales aims through enabling the requirements of TAN15 to be met in a greater number of areas. Care must be taken to ensure compliance with TAN15 is not at the cost of non-compliance with other TAN's, such as Nature Conservation and Design.
Welsh Government	Identifies the priorities to deliver a prosperous and competitive	The FRMPs will ensure tourists, and businesses within

(2013) The Welsh Government Strategy for Tourism 2013 – 2020. Partnership for Growth	tourism industry in Wales. It sets out how Welsh tourism will be promoted and communicated more effectively and how investment will be directed to improve quality and choice for the consumer.	tourist areas (notably along the coast) are protected from flooding and damage to their lives, livelihoods and the local area they depend upon, supporting the objectives of the Strategy for Tourism.
Welsh Government (2010) Rural Development Plan for Wales (2007-2013 and 2014-2020)	Sets out measures for rural areas in Wales, including promoting knowledge and improving human potential; restructuring and developing physical potential and promoting innovation; targeting the sustainable use of agricultural land; targeting the sustainable use of forestry land; diversifying the rural economy; and improving the quality of life in rural areas.	The FRMPs align with this plan as they will deliver reductions in flood risk and thus promote rural development and empowerment. Rural development must be implemented considering potential increases in flood risk, or development in existing flood zones.
Welsh Government (2008) People, Places, Future – The Wales Spatial Plan	Integrates the spatial aspects of national strategies for social inclusion and economic development, health, transport and environment, translating the Welsh Government’s sustainable development duty into practice.	The FRMP will work in alignment with the Wales Spatial plan to reduce potential adverse consequences of flooding on human health, the environment, cultural heritage and economic activity, thereby assisting in the delivery of the Plan.
Welsh Government (2008) One Wales One Planet: The Sustainable Development Scheme for Wales	Sets out proposals to promote sustainable development, how the Welsh Government will make sustainable development a reality for people in Wales, and the benefits that people will see from this, particularly in less well-off communities.	The FRMP will work in alignment with the Wales Sustainable Development Scheme to reduce potential adverse consequences of flooding on human health, the environment, cultural heritage and economic activity, thereby assisting in the delivery of the plan. Wider socio-economic, environmental and heritage conservation issues need to be considered within the FRMP.
<i>Biodiversity</i>		
Wales Biodiversity Partnership (2010) Wales Biodiversity Framework	Identifies the key practical, policy and legislative drivers for protecting, restoring and enhancing biodiversity in Wales; outlining the mechanisms for promoting positive action and explaining the roles and	The FRMP's will deliver protection from coastal and fluvial flooding which can lead to habitat and species loss through inundation. However, implementation of the policies of the FRMP must ensure all

	remit of those responsible for undertaking biodiversity action.	practicable steps are taken to protect, compensate and enhance biodiversity and habitats to enable alignment with this framework.
Forestry Commission Wales (now Natural Resources Wales) (2009) Woodland Strategy for Wales	The Strategy sets out aims and objectives for all woodlands and trees in Wales and the role of woodlands and trees in delivering social economic and environmental benefits and also the contribution they can make towards addressing the impacts of climate change.	This strategy aligns with the FRMPs as increased woodland cover across Wales will reduce flood risk through increased catchment storage, aligning with the objectives of the FRMPs.
Welsh Government (2008) Wales Fisheries Strategy	Strategy for the management and development of fisheries in Wales covering aquaculture, commercial fisheries, and recreational fisheries for 2020.	Developing fisheries within Wales, through enhancing fish habitat, removing obstacles to passage (dams, weirs etc.) is often in direct conflict with flood risk management, and balances must be sought. The FRMPs must consider ways to sustainably manage fish populations within the rivers and estuaries of Wales whilst delivering their objectives.
Welsh Government (2006) Environment Strategy for Wales	Provides the framework to achieve an environment which is clean, healthy, biologically diverse and valued by the people of Wales.	Key objectives set out within the Environment Strategy for Wales, such as addressing climate change and environmental hazards (flooding) will help to relieve flood risk across many areas and contribute to delivery of the objectives of the FRMPs. care must be taken to ensure that reductions in flood risk through, most notably, improved defence infrastructure projects is not at the expense of ecological, heritage, landscape and other environmental sensitivities and assets.
Welsh Government (2012) Sustaining a Living Wales: A Green Paper on a	This consultation resulted in policy commitments that are being taken forward under the Natural Resource management programme. The programme	The consultation outlines a desire to challenge traditional approaches to managing flood. It puts much greater emphasis on the management of the

New Approach to Natural Resource Management in Wales	includes natural resource management policy, the Environment Bill, embedding the Ecosystems approach.	flood risk as whole, starting with retaining more water in uplands and slowing its rate of movement, allowing more areas of lowland to flood naturally to dissipate impacts. The FRMPs will improve the flood risk service provided by Welsh ecosystems.
<i>Recreation</i>		
Welsh Government (2005) Climbing Higher – The Welsh Government’s 20 year strategy for sport and physical activity in Wales	Seeks to maximise the contribution of sport and physical activity to wellbeing in Wales, with one target to increase the percentage of the people in Wales using the Welsh natural environment for outdoor activities from 36% to 60%.	The FRMPs need to take into account the use of Wales' rivers, lakes and coastal waters as an outdoor recreation and health resource. Access to these waters should not be compromised through the achievement of the FRMP objectives so their recreational use is retained.
<i>Geology, Soils and Agriculture</i>		
Welsh Government (2009) Farming, Food and Countryside: Building a Secure future – A New Strategy for Farming	The objective of the strategy is to achieve a sustainable and profitable future for farming families and businesses through the production and processing of farm and forestry products whilst safeguarding the environment	The FRMPs align with this policy as they will protect farmland from flooding in many areas, increasing the security and resilience of agricultural businesses.
Welsh Government (2008) Wales Soils Action Plan - Consultation	Sets out the case for developing a plan to adapt to future pressures on soils including climate change related effects such as changes to soil carbon and soil structure	Flooding can cause extensive erosion of soil and reduce the productivity of land through waterlogging, so a reduction in flood risk can lead to improvements in soil quality. Conversely, good quality soil can allow more infiltration of water than poor quality soil, which can lead to reduced or slower runoff and thus reduced flood risk.
Environment Agency Wales (now Natural Resources Wales) (2002) Metal	Strategy developed to assess all the issues at the most polluting historic metal mines in Wales, with the aim of developing remediation options.	There is limited interaction between the FRMPs and this strategy, however the FRMPs, by reducing inundation of land adjacent to rivers whose water and sediment is contaminated

Mines Strategy for Wales		by abandoned metal mines, will reduce the contamination risk of these mines and improve the quality of agricultural land.
Welsh Government (2001) Minerals Planning Policy Wales (MPPW)	Sets out the land use planning policy guidance in relation to mineral extraction and related development in Wales.	There is limited interaction between MPPW and the FRMPs, but MPPW does advise sustainable use of minerals so no increase in flood risk should be caused by the implementing of the policies. The FRMPs must consider the mineral resource within any areas of proposed works to ensure there is no conflict between the policies.
<i>Material Assets</i>		
Welsh Government (2008) Wales Transport Strategy	Promotes sustainable transport networks that safeguard the environment and strengthen Wales' economic and social life.	The FRMPs will protect critical transport infrastructure from flooding and damage due to flooding, which will enhance the transport network and reduce congestion and delays.
<i>Waste</i>		
Welsh Government (2010) National Waste Strategy for Wales: Towards Zero Waste 2009-2050	The strategy sets out a long-term aim of zero waste by 2050 and a medium term aim of achieving a high recycling society by 2025. This is supported by a range of recycling and other waste management targets including in relation to commercial and industrial waste.	The FRMPs will indirectly reduce waste caused as a result of damage through flooding, resulting in less material going to landfill and fewer new products purchased. A reduction in waste at a national scale will mitigate for climate change in the long-term and will reduce flood risk, contributing to the objectives of the FRMPs.
<i>Climate</i>		
Welsh Government (2010) Low Carbon Wales	Details the process through which the Wales Spatial Plan can serve as a vehicle for transition to a low carbon energy whilst also providing background information and suggestions to enable regions in Wales to select carbon reduction priorities for action.	This plan aligns with the FRMPs as in the long-term, increases in low-carbon energy production will reduce greenhouse gas emissions, global surface temperature warming and thus sea-level rise. This will prevent further increases in flood risk on the coasts and estuaries from sea-

		level rise and extreme events will be reduced in frequency and magnitude.
Welsh Government (2010) Climate Change Strategy for Wales	States the Welsh Government's policy intentions in relation to climate change and expands on the commitments set out in One Wales. The strategy re-iterates the One Wales commitments to 3 per cent annual carbon reductions and sets out expectations for businesses and society for 2020.	The Strategy will contribute to reductions in flood risk on the coasts and estuaries from sea-level rise and flooding from extreme events will be reduced in frequency and magnitude. The FRMPs will take into account predicted sea level rise and increases in extreme events as a result of predicted climate change over the next century and further beyond, therefore will contribute to the required climate change adaptation identified within the Climate Change Strategy for Wales.
Welsh Government (2010) Low Carbon Revolution – the Welsh Government Energy Policy Statement	Sets out the Welsh Government's ambitions for low carbon energy in Wales, with aims including improvements in housing energy efficiency improvements, local energy generation, capturing of offshore and onshore wind, stream and tidal, hydropower, geothermal and biomass energy and installing carbon capture technology on all new fossil fuel power plants	In the long-term, increases in low-carbon energy production will reduce greenhouse gas emissions, global surface temperature warming and thus sea-level rise. This will prevent further increases in flood risk on the coasts and estuaries from sea-level rise and extreme events will be reduced in frequency and magnitude.
Welsh Government (2012) Preparing Wales for Climate Change. Energy Wales A Low Carbon Transition	Aims to enhance the economic, social and environmental wellbeing of the people and communities of Wales – to achieve a better quality of life for this and future generations by creating a sustainable, low carbon economy for Wales.	The FRMPs will take into account predicted sea level rise and increases in extreme events as a result of predicted climate change over the next century and further beyond, therefore will contribute to the required climate change adaptation identified within the Climate Change Strategy for Wales.
<i>Landscape</i>		
<i>Cultural Heritage</i>		
Valuing our Environment Partnership (2010)	The report presents an economic argument that the environment (specifically the historic	The document provides background evidence to support the preservation of the

Valuing the Welsh Historic Environment	environment) is fundamental to prosperity in Wales	historic environment, which can be divergent from the objectives of the FRMP which aim to deliver improvements to flood risk.
Western Wales Regional PPPs		
<i>Water</i>		
Coastal Groups – Various (2009-2012) SMP2 (Lavernock to St Ann’s Head; West of Wales; North West England and North Wales	These plans makes provision for management of the coastline within the Western Wales River Basin District and beyond, to minimise coastal erosion and flooding whilst also considering coastal communities, existing infrastructure, tourist and amenity areas and the natural environment	The FRMPs align with the SMP2, having mutual objectives to reduce flood risk around the coast of Wales. The FRMPs have a wider scope however, considering fluvial and surface water flooding also.
Environment Agency Wales (now Natural Resources Wales) (Various) Catchment Abstraction Management Strategies (CAMS)	These are six-year plans detailing how water resources in the relevant area will be managed. CAMS documents set out how much water is available for licensing in each catchment and indicates where catchments are over-abstracted or over-licensed during periods of low flow.	Less abstractions within catchments will increase flood risk, due to higher volumes of water within the channels - conflicting with the aims of the FRMPs. The measures in the FRMPs therefore should consider these strategies to ensure that adequate protection is in place from a potentially greater level of flood risk.
Environment Agency Wales (now Natural Resources Wales) (Various) Catchment Flood Risk Management Plans	These plans give an overview of the flood risk (except coastal) across each river catchment, taking into account changes to climate and land management. They recommend ways of managing those risks now and over the next 50-100 years	The FRMP aligns with these Catchment Flood Risk Management Plans, having mutual objectives to reduce flood risk from the rivers of Wales. The FRMPs have a wider scope however, considering coastal and surface water flood risk also.
Local Authorities – Various (Various) Surface Water Management Strategies	Outline the preferred surface water management strategy in a given location. In this context surface water flooding describes flooding from sewers, drains, groundwater, and runoff from land, small water courses and ditches that occurs as a result of heavy rainfall.	The FRMP aligns with these SWMPs, having mutual objectives to reduce surface water flood risk in Wales. The FRMPs have a wider scope however, considering coastal and fluvial flood risk also.
Dwr Cymru Welsh Water (DCWW) (2013) Draft Water	Provides details how DCWW will ensure that adequate water is available to meet the planned	The plan considers how to sustainably manage the water environment to ensure future

Resources Management Plan	growth in population, housing and economic activity in its supply area, while taking account of climate change and minimising impacts on customers' bills and the environment.	water supplies, with some alignment with the FRMP objectives. The FRMP will need to ensure that implementation of measures does not compromise future potential to extract water for potable use. The plan could reduce flood risk through greater storage and impoundment of water for use by customers.
DCWW (Unpublished) Drought Plan	This plan sets out the steps that DCWW will take through the stages of developing drought, drought, severe drought and recovery from drought to ensure their supply of water resources	The plan considers how to sustainably manage the water environment to ensure future water supplies and provide water during drought, with some alignment with the FRMP objectives. The FRMP will need to ensure that implementation of measures does not compromise future potential to extract water for potable use. The plan could reduce flood risk through greater storage and impoundment of water for use by customers.
<i>Spatial Planning / Population</i>		
Local Planning Authorities – Various (Various Dates) Development Planning Policy	The plans set out policies to guide the development and use of land. They direct development to appropriate locations, whilst outlining a desire to conserve the natural, built and historic environment. Land is generally allocated for employment, residential or open space purposes.	The FRMPs will deliver objectives of the Local Development Plans through opening new land for potential development, and protecting existing developments from flood risk.
<i>Biodiversity</i>		
Environment Agency Wales (various) Salmon Action Plans	The aim of the action plans is to ensure the objectives set out in the National Salmon Strategy are met. They set out what needs to be done to support and restore salmon populations.	These plans are largely focused on the protection and enhancements of fish populations and habitats, and offer little alignment with the FRMPs key objectives. However, more natural river channels and riparian zones

		are recognised to reduce the risk of flooding as well as enhancing fish habitat, thereby contributing to achievement of the FRMP's objectives.
Defra (2010) Eel Management plans for the United Kingdom: Western Wales River Basin District	Eel management plans describe the current status of Eel populations across river basin districts and assesses compliance with targets set out in EU Council Regs 110/2207.	These plans are largely focused on the protection and enhancements of eel populations and habitats, and offer little alignment with the FRMPs key objectives. However, more natural river channels and riparian zones are recognised to reduce the risk of flooding as well as enhancing eel habitat, thereby contributing to achievement of the FRMP's objectives.
<i>Recreation</i>		
<i>Geology, Soils and Agriculture</i>		
<i>Material Assets</i>		
<i>Waste</i>		
<i>Climate</i>		
<i>Landscape</i>		
Various (2010) AONB Management Plans: Penrhyn Llyn; Gower; Anglesey; Clwydian Range	The management plans for AONBs contain actions to ensure the protection and enhancement of the landscape quality of these areas.	These plans are largely focused on the protection of the landscape and natural heritage and offers little alignment with the FRMPs key objectives. However improvements to biodiversity and the wider ecosystems, and thus natural heritage, through increased tree / vegetation cover in catchments, wetland creation and more natural river channels and riparian zones are recognised to reduce the risk of flooding, thereby contributing to achievement of the FRMP's objectives.

<p>National Park Authorities (Snowdonia, Pembrokeshire Coast, Brecon Beacons) (2012) Management Plans</p>	<p>The management plans for National Parks contain actions to ensure the protection and enhancement of the landscape and natural environment of these areas, conserve and enhance the natural beauty, wildlife and cultural heritage of the area; and to promote opportunities for the understanding and enjoyment of the special qualities of the area by the public</p>	<p>These plans are largely focused on the protection of the landscape and natural heritage and offers little alignment with the FRMPs key objectives. However improvements to biodiversity and the wider ecosystems, and thus natural heritage, through increased tree / vegetation cover in catchments, wetland creation and more natural river channels and riparian zones are recognised to reduce the risk of flooding, thereby contributing to achievement of the FRMP's objectives.</p>
<i>Cultural Heritage</i>		

Annex B: Scoping consultation responses summary

Consultee response	NRW action taken
January 2014 NRW – Strategic Assessment Team, Governance	
Explanation and clarification of the spatial scope of the study area. Concern that the Severn Estuary is not considered as an entity but is split between the Western Wales and Severn and South West RBD	The study area is the same as the RBMPs and was set following wide consultation with stakeholders. It is shown in Fig 1.1 of this report.
Noted that the FRMP consolidates information from other plans. Query whether these plans are likely to be reviewed or revoked.	The existing plans, CFMP, SMP and Tidal Strategies continue to be referred to and used in FRM to set the strategic direction. There is currently no intention to review or revoke them. If and when they are reviewed or revoked they will be screened for SEA and HRA.
Clarification requested on the assessment methodology, particularly in reference to existing plans	Section 4 outlines and clarifies the methodology. Existing policies were considered in the cumulative assessment and were used to cross check that FRMP proposed measures in Communities at Risk were in line with the underlying strategic policies.
Reference has only been made to flooding from main river, sea and reservoirs. Query whether non-main river, lakes etc should also be considered.	Non-main river and surface water flooding will be considered by Lead local Flood Authorities who are responsible for producing their own FRMPs. Clarified in Chapter 1
Jan 2014 Cadw – No response received	
August 2014 NRW – Strategic Assessment Team, Governance	
Further clarification of the consultation process for the SEA requested & closer involvement of the statutory consultation bodies.	The statutory scoping consultation was undertaken in January 2014. Responses were taken into account in the subsequent FRMP scoping report published in June 2014. Publication was delayed due to the winter flood events.
Clarification requested on the process of scoping the likely significant effects of new measures	This process refers to the consideration of potential environmental effects of the measures proposed in the plan. Certain measures such as flood forecasting will not have environmental effects and so was “scoped out” of the assessment process. This has been clarified in section 4 of this document
Provision of greater detail on the environmental baseline and inclusion of	Noted. Further detail has been considered on the baseline and evolution of the

more maps. There is limited detail on predicted trends, environmental objectives, indicators and targets, significant environmental issues/ problems or a strategic appraisal of alternatives.	baseline in the Appraisal Summary Tables and will be summarised for those ecosystem services likely to be significantly effected in the Environmental Report. Maps to demonstrate the populations, assets and habitats will be provided in the FRMP and ER, where relevant. Consideration of alternatives will also be documented in the ER. Overall, the aim has been to avoid duplication with existing plans and their SEA's, whilst meeting the legal requirements of the SEA Regulations.
Environmental Objectives of the Plan should be clearly set out.	Noted. FRMP objectives (incorporating environmental objectives) are set out in this report.
Queried the relation between recently published flood risk maps and flood hazard maps and how they relate to the flood hazard maps and provisions in TAN15	The flood risk and hazard maps were published in Dec 2013. NRW is having ongoing discussions with WG regarding TAN15.
Local Flood Risk Management Strategies and FRMPs being produced by Local Authorities will require SEA and HRA and liaison with SAT in NRW.	Guidance on FRMPs, SEA and HRA has been provided to Local Authorities and they are aware of their responsibilities.
Query regarding the status of Second Generation SMP.	The Wales SMP2's have been published in draft but have not been approved and adopted. The draft SMP2 policies have been used in the FRMP.
Biodiversity, flora and fauna section should include a map of protected sites and should make reference to the issue of habitat fragmentation and the need to establish and maintain functioning ecological networks.	Noted and included in Chapter 4: Provision of Habitat (Biodiversity).
More information on the WFD waterbody status across the RBD would be useful to demonstrate how the FRMP and RBMP are being joined-up.	Noted. The level of information at the RBD level is not possible to show clearly on a map, but statistics have been included throughout this report and synergies and conflicts have been considered in the assessment and documented in Chapter 4.
The assessment process should include a consideration of climate change resilience.	The FRMP itself considers climate change resilience. The assessment concluded no significant effect on the climate regulation ecosystem service.
August 2014 Cadw – No response received	



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