

# Appendix G: North West Local Measures

## 1.0 Introduction

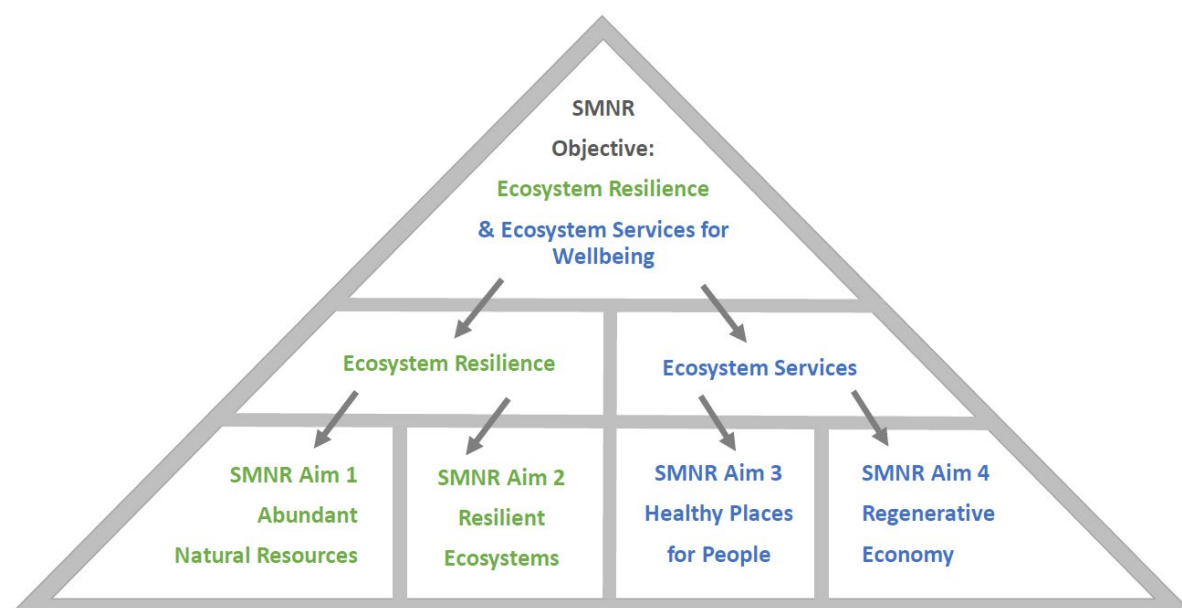
This document will consider the opportunities and constraints associated with the local measures for North West Wales. The aim of this is to:

- Consider beneficial and adverse impacts of the local measures to feed in to the main Environmental Report.
- Provide a stand-alone reference for local delivery that will identify constraints and opportunities for delivering multiple benefits, contributing to the Aims of SMNR and aligned with the Area Statement and Local Wellbeing Plan.

The Environment Act guidance set out 4 Aims for SMNR which contribute to meeting the SMNR objective set out in the Act. When Wales achieves the aims we will have achieved SMNR and met the objective set out in the Environment Act, and made the maximum contribution nature can make to the Wellbeing goals. The four aims are:

1. Stocks of natural resources are safeguarded and enhanced (Extent and condition of ecosystems)
2. Resilient ecosystems (Diversity, Connectivity, Adaptability of ecosystems)
3. Healthy places for people, protected from environmental risks
4. Contributing to a regenerative economy achieving sustainable levels of production and consumption.

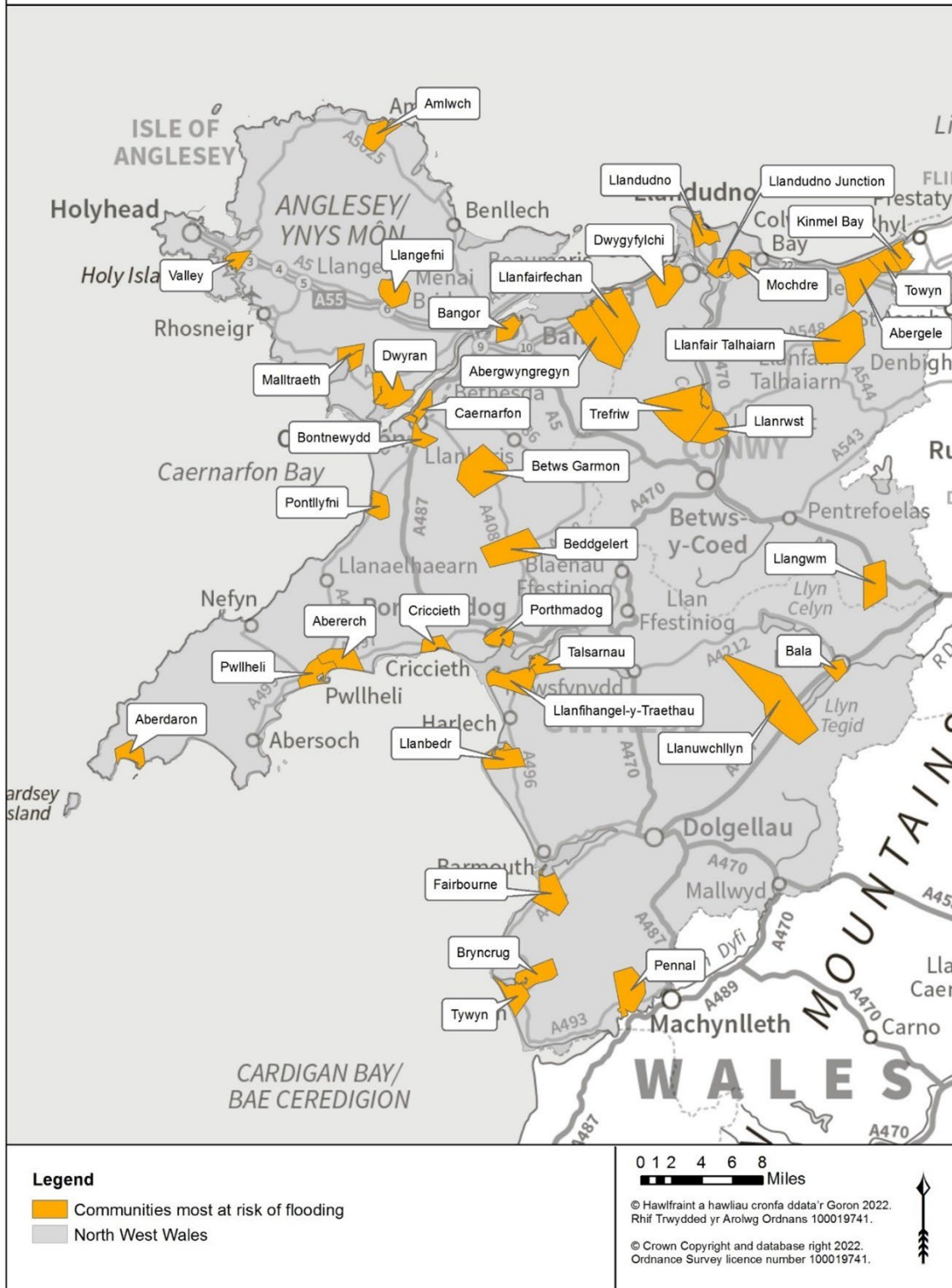
Figure 1: Objective and Aims of SMNR



Local FRMP measures are proposed for the communities in North West Wales that are most at risk of flooding from main rivers and sea and need action to be taken to reduce risk. Lead Local Flood Authorities manage other sources of flood risk which should be considered when measures are implemented. Figure 2 and Table 1 shows the communities across North West Wales Place where action is needed to manage and reduce the risk of flooding. For further details refer to the FRMP for Wales: North West Place.

Community name	Community name
Aberdaron	Llandudno Junction
Abererch	Llanfair Talhaiarn
Abergele	Llanfairfechan
Abergwyngregyn	Llanfihangel - y - Traethau
Amlwch	Llangefni
Bala	Llangwm
Bangor	Llanrwst
Beddgelert	Llanuwchllyn
Betws Garmon	Malltraeth
Bontnewydd	Mochdre
Bryncrug	Pennal
Caernarfon	Pontllyfni
Criccieth	Porthmadog
Dwygyfylchi	Pwllheli
Dwyran	Talsarnau
Fairbourne	Towyn
Kinmel Bay	Trefriw
Llanbedr	Tywyn
Llandudno	Valley/ Dyffryn

**Table 1: Communities across North West Place where action is needed to manage and reduce the risk of flooding**



**Figure 2 shows the communities across North West Wales Place where action is needed to manage and reduce the risk of flooding.**

## 1.1 Approach

The FRMP is presented as National Measures which are grouped under FRM activities that are undertaken across Wales. These activities are:

- WA1 - Management of flood risk assets
- WA2 - Reservoir management and regulation
- WA3 - Flood forecasting and issuing warnings
- WA4 - Hydrometry and telemetry, hydrology and geomorphology,
- WA5 - Community engagement and resilience
- WA6 - Understanding and analysing flood risk
- WA7 - Flood risk advice, permitting, compliance and enforcement
- WA8 - Responding to flood incidents
- WA9 - Strategic planning and oversight of investment

The national measures that sit under each of these activities have all been scoped into the assessment. The assessment has been undertaken at an activity level and is presented in Appendix D.

The six Place Sections of the FRMP each set out a number of measures for specific communities across Wales. These amount to 269 local measures across Wales. The local measures have been considered in the national scale assessment under the relevant activity (identified in Table 2). For example, the local measure to “Improve existing flood warning service” was assessed under WA3 which demonstrated significant beneficial effects or neutral effects across all receptors. Consideration at a local level would not alter these assessments.

This appendix considers all the local measures in North West Wales Place and maps the local measures to the national assessment. Further consideration has been given to local measures where they propose to:

- Undertake initial assessment and feasibility work for reducing flood risk, or
- Design and construction of flood risk asset improvement

Whilst these measures have been assessed under WA1 in the national assessment, the spatial alignment has allowed us to further consider constraints and opportunities in these places. These measures could result in physical interventions in these locations to manage flood risk and so they present an opportunity to integrate planning and delivery across different parts of NRW and to inform project level environmental assessment that will be undertaken as each of these measures progress.

Certain local measures are already undergoing project level environmental assessment and where this is the case, it has been identified.

## 2.0 Scoping the Local Measures Assessment

Table 2 lists all the local measures that are proposed for the management of flood risk in North West Wales Place. We have identified how each measure links to and is considered in the national impact assessment and highlighted which measures we are considering further in this document to identify local constraints and opportunities that align with the Area Statement and Well Being Plan.

**Table 2: Local FRMP measures for North West Wales**

Ref.	Location	Source	Measure name	Measure type	Timescale	Scope in to the local assessment
NW1	Aberdaron	River/ Sea	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Long Term	Yes (WA1)
NW2	Aberdaron	River/ Sea	Maintain existing defences and inspection regime	Protection	Short Term	National (WA1)
NW3	Abererch	Sea	Develop scheme appraisal for flood alleviation scheme	Protection	Short Term	Yes (WA1)
NW4	Abererch	River	Develop scheme appraisal for flood alleviation scheme	Protection	Medium Term	Yes (WA1)
NW5	Abererch	River/ Sea	Maintain existing defences and inspection regime	Protection	Short Term	National (WA1)
NW6	Abergele	River	Design and construction of flood risk asset improvements	Protection	Long Term	Yes (WA1)
NW7	Abergele	River	Design and construction of flood risk asset improvements	Protection	Medium Term	Yes (WA1)
NW8	Abergwyngregyn	Sea	Consider future management options and undertake coastal adaptation planning	Review	Long Term	Yes (WA1)

Ref.	Location	Source	Measure name	Measure type	Timescale	Scope in to the local assessment
NW9	Abergwyngregyn	River	Build hydraulic model	Review	Medium Term	National (WA4)
NW10	Amlwch	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Medium Term	Yes (WA1)
NW11	Bala	River	Improve existing flood warning service	Preparedness	Medium Term	National (WA3)
NW12	Bala	River	Update existing hydraulic model	Review	Short Term	National (WA4)
NW13	Bala	River	Design and construction of flood risk asset improvements	Protection	Short Term	Yes (WA1)
NW14	Bala	River	Maintain existing defences and inspection regime	Protection	Short Term	National(WA1)
NW15	Bangor	River	Update existing hydraulic model	Review	Short Term	National (WA4)
NW16	Beddgelert	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Short Term	Yes (WA1)
NW17	Beddgelert		Improve existing flood warning service	Preparedness	Short Term	National (WA3)
NW18	Betws Garmon (Gwyfrai terrace)	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Short Term	Yes (WA1)
NW19	Bontnewydd	River	Design and construction of flood risk asset improvements	Protection	Short Term	Yes (WA1)
NW20	Bryncrug	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Medium Term	Yes (WA1)
NW21	Bryncrug	River	Maintain existing defences and inspection regime	Protection	Short Term	National (WA1)
NW22	Caernarfon (Seiont Mill)	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Short Term	Yes (WA1)

Ref.	Location	Source	Measure name	Measure type	Timescale	Scope in to the local assessment
NW23	Clwyd	Sea	Development of the recommendations from the Clwyd strategy	Preparedness /Protection/ Review	Medium Term	Strategic Environmental Assessment of the Clwyd Strategy is in place
NW24	Clwyd	River/ Sea	Maintain existing defences and inspection regime	Protection	Medium Term	National (WA1)
NW25	Clwyd - Ffynnon y Ddol	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Short Term	Yes (WA1)
NW26	Clwyd - Old Foryd Road	Sea	Design and construction of flood risk asset improvements	Protection	Medium Term	Yes (WA1)
NW27	Conwy	River	Work with other RMAs where we have a joint interest, to plan and undertake activities that reduce the risk of flooding to communities	Prevention/ Protection/ Preparedness / Review	Medium Term	National (WA1)
NW28	Conwy	River/ Sea	Maintain existing defences and inspection regime	Protection	Short Term	National (WA1)
NW29	Criccieth	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Long Term	Yes (WA1)
NW30	Dinas Dinlle	Sea	Consider future management options and undertake coastal adaptation planning	Review	Medium Term	Yes(WA1)
NW31	Dwygyfylchi	River	Build hydraulic model	Review	Long Term	National (WA4)
NW32	Dwyran	River	Undertake initial assessment and feasibility work for reducing flood risk.	Protection	Short Term	No (project level environmental assessment underway)
NW33	Dwyran - Braint	River	Improve existing flood warning service	Preparedness	Short Term	National (WA3)



Ref.	Location	Source	Measure name	Measure type	Timescale	Scope in to the local assessment
NW34	Dysynni	Sea	Consider future management options and undertake coastal adaptation planning	Review	Medium Term	No (project level environmental assessment underway)
NW35	Eryri Meirionnydd	River/Sea	Design and construction of flood risk asset improvements	Protection	Medium Term	Yes (WA1)
NW36	Fairbourne	Sea	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Short Term	Yes (WA1)
NW37	Gwehelog (Mochras)	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Long Term	Yes (WA1)
NW38	Harlech	Sea	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Short Term	Yes (WA1)
NW39	Kinmel Bay	Sea	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Short Term	Yes (WA1)
NW40	Kinmel Bay	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Medium Term	Yes (WA1)
NW41	Llanbedr	Tidal	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Medium Term	Yes (WA1)
NW42	Llandudno	Sea	Update existing hydraulic model	Review	Medium Term	National (WA4)
NW43	Llanfair Talhaiarn	River	Design and construction of flood risk asset improvements	Protection	Short Term	No (project level environmental assessment underway)
NW44	Llanfair Talhaiarn – Elwy	River	Design and construction of flood risk asset improvements	Protection	Short Term	No (project level environmental assessment underway)



Ref.	Location	Source	Measure name	Measure type	Timescale	Scope in to the local assessment
NW45	Llanfair Talhaiarn – Nant Barrog	River	Design and construction of flood alleviation scheme	Protection	Short Term	No (project level environmental assessment underway)
NW46	Llanfair Talhaiarn – Nant Barrog	River	Consider and integrate nature-based solutions including natural flood management in NRW flood risk schemes and activities	Prevention	Short Term	No (project level environmental assessment underway)
NW47	Llanfair Talhaiarn	River	Improve existing flood warning service	Preparedness	Short Term	National (WA3)
NW48	Llanfairfechan	River	Update existing hydraulic model	Review	Medium Term	National (WA4)
NW49	Llanfihangel - y - Traethau (Ty Gwyn Tidal door)	Sea	Design and construction of flood risk asset improvements	Protection	Medium Term	Yes (WA1)
NW50	Llangefni	River	Develop scheme appraisal for flood alleviation scheme	Protection	Short Term	No (project level environmental assessment underway)
NW51	Llanuwchllyn	River	Improve existing flood warning service	Preparedness	Medium Term	National (WA3)
NW52	Llanuwchllyn	River	Update existing hydraulic model	Review	Short Term	National (WA4)
NW53	Llyn Tegid	River	Design and construction of flood alleviation scheme	Protection	Short Term	No (project level environmental assessment underway)
NW54	Malltraeth	Sea	Design and construction of flood risk asset improvements	Protection	Medium Term	Yes (WA1)
NW55	Mochdre	River	Update existing hydraulic model	Review	Long Term	National (WA4)

Ref.	Location	Source	Measure name	Measure type	Timescale	Scope in to the local assessment
NW56	North Wales Coast - Pensarn to Red Wharf Bay	Sea	Build hydraulic model	Review	Medium Term	National (WA4)
NW57	North Wales Coast - Ynys Mon	Sea	Build hydraulic model	Review	Long Term	National (WA4)
NW58	Pennal	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Medium term	Yes (WA1)
NW59	Pontllyfni	Sea	Consider future management options and undertake coastal adaptation planning	Review	Long Term	Yes (WA1)
NW60	Porthmadog	Sea / River	Improve existing flood warning service	Preparedness	Short Term	National (WA3)
NW61	Porthmadog	Sea / River	Develop scheme appraisal for flood alleviation scheme	Protection	Short Term	No (project level environmental assessment underway)
NW62	Pwllheli	River/ Sea	Update existing hydraulic modelling	Review	Short Term	National (WA4)
NW63	Pwllheli	River/ Sea	Develop scheme appraisal for flood alleviation scheme	Protection	Short Term	No (project level environmental assessment underway)
NW64	Talsarnau	Sea	Consider future management options and undertake coastal adaptation planning	Review	Long Term	Yes (WA1)
NW65	Tan Lan	Sea	Consider future management options and undertake coastal adaptation planning	Protection	Short Term	No (project level environmental assessment underway)

Ref.	Location	Source	Measure name	Measure type	Timescale	Scope in to the local assessment
NW66	Towyn	Sea	Maintain existing defences and inspection regime	Protection	Long Term	National (WA1)
NW67	Trefriw (Crafnant Loop)	River	Design and construction of flood risk asset improvements	Protection	Short Term	Yes (WA1)
NW68	Trefriw (Princess Street)	River/Sea	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Long Term	Yes (WA1)
NW69	Tywyn	River	Undertake initial assessment and feasibility work for reducing flood risk	Protection	Long Term	Yes (WA1)
NW70	Tywyn	River	Improve existing flood warning service	Preparedness	Long Term	National (WA3)
NW71	Valley/ Dyffryn	River/Sea	Update existing hydraulic model	Review	Long Term	National (WA4)
NW72	Ynys Mon	River	Work with other RMAs where we have a joint interest, to plan and undertake activities that reduce the risk of flooding to communities	Prevention/Protection/Preparedness/Review	Medium Term	National (WA1)
NW73	Ynys Mon	River/Sea	Maintain existing defences and inspection regime	Protection	Short Term	National (WA1)
NW74	North West Wales Place	River/Sea	Work with RMAs where we have a joint interest, to plan and undertake activities that reduce the risk of flooding to communities	Prevention/Protection/Preparedness/Review	Short Term	National (WA1)

### 3.0 Key environmental constraints and opportunities

The FRMP Scoping Report provides a full overview of the environmental baseline at a national level, and the Environmental Report summarises the baseline and key issues relevant to the FRMP. This section will not repeat this information. A greater level of detail and background into North West Wales Place can be found in the following Area Statements:

[Natural Resources Wales / North West Wales Area Statement](#)

[Natural Resources Wales / Introduction to Wales' Marine Area Statement](#)

We have worked with North West Wales People and Places team to identify particular opportunities and constraints in each of the communities scoped in to this assessment. The aim is to inform and encourage cross functional planning of projects to maximise delivery against the Aims of SMNR and to inform project level environmental assessment. Where spatially specific information is available we have included it in Table 3 below, this supplements the fuller description of the environmental baseline as documented in the Scoping Report and Environmental Report. In undertaking this exercise other place based information that applies throughout North West Wales, that is of relevance for FRM activities was gathered and is set out under the four aims of SMNR. This information is not exhaustive and is meant as a prompt to encourage early and integrated planning.

**Table 3: Opportunities and Constraints**

Ref	Location	Resilient Ecosystems (Aim 2)	Healthy Places WFD Status / Heavily Modified Waterbody (Aim 2)	Health & wellbeing, recreation, access (Aim 3)	Fisheries projects / River restoration /Opportunity catchment (Aim 4)
NW1	Aberdaron	Aberdaron Coast and Bardsey Island marine protected areas SPA, West Wales Marine SAC, Pen Llyn a'r Sarnau SAC, Glannau Aberdaron SSSI	WFD protected area Aberdaron bathing water - need to reduce risks to bathing water status from any work (eg sediment) Cardigan Bay North coastal waterbody GB621009600000	Wales Coast Path	

Ref	Location	Resilient Ecosystems (Aim 2)	Healthy Places WFD Status / Heavily Modified Waterbody (Aim 2)	Health & wellbeing, recreation, access (Aim 3)	Fisheries projects / River restoration /Opportunity catchment (Aim 4)
NW3, 4	Abererch	Pen Llyn a'r Sarnau SAC/Morfa Aberech SSSI	Tremadog bay coastal waterbody GB651009350000 good status, driving elements invertebrates Erch Lower GB110065053570 moderate status, driving elements Mac_Phyto	Wales Coast Path /access	
NW6, 7	Abergele	Liverpool Bay SPA Coed y Gopa SSSI/Traeth Pensarn SSSI	GB110066059980 Gele HMWB mitigation measures review work - check for opportunities to deliver	Active Travel/Access	
NW8	Abergwyngregyn	Coedydd Aber SAC/SSSI Menai Strait and Conwy Bay SAC, Traeth Lavan SPA, Liverpool Bay SPA and Traeth Lafan LNR	GB110065058550 - good	Public footpath	
NW12	Bala	River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (Wales) SAC	WFD HMWB mitigation measures work link here GB111067052240Dee - Alwen to Llyn Tegid plus multiple upstream WBs (Tryweryn - Dee to Mynach; Tryweryn - Mynach to Llyn Celyn; Llyn Celyn, Llyn Tegid). Studies ongoing regarding impact of sluices on fish migration.	Public footpath/accesses and longer term management options	

Ref	Location	Resilient Ecosystems (Aim 2)	Healthy Places WFD Status / Heavily Modified Waterbody (Aim 2)	Health & wellbeing, recreation, access (Aim 3)	Fisheries projects / River restoration /Opportunity catchment (Aim 4)
NW15	Beddgelert	Meirionnydd Oakwoods and Bat Sites SAC, Coedydd Beddgelert a Cheunant Aberglaslyn SSSI	GB110065053950 – Colwyn, Moderate GB110065053910 – Nanmor to Colwyn, Good GB110065053960 – Upstream Colwyn, Moderate	Public footpath	
NW17	Betws Garmon (Gwyfrai terrace)	Afon Gwyrfai and Llyn Cwellyn SAC /SSSI	Gwyrfai - downstream of Cwellyn - GB110065054190. Discussions about review of release agreement from reservoir with DCWW potentially for this NEP (next AMP)		
NW18	Bontnewydd	Afon Gwyrfai and Llyn Cwellyn SAC SSSI	Gwyrfai - downstream of Cwellyn - GB110065054190.		Potential fish pass work planned here please check with Katrina Marshall.
NW19	Bryncrug	Broadwater SSSI	GB110064048410 - good, driving element hydro, morph. Opportunity to work with DCWW re abstraction screening	Public footpath/accesses	
NW21	Seiont Mill, Caernarfon	Menai Strait and Conwy Bay SAC Afon Seiont SSSI	GB110065054040 - moderate, driving elements Mac_Phyto.	Wales Coast Path	

Ref	Location	Resilient Ecosystems (Aim 2)	Healthy Places WFD Status / Heavily Modified Waterbody (Aim 2)	Health & wellbeing, recreation, access (Aim 3)	Fisheries projects / River restoration /Opportunity catchment (Aim 4)
NW24	Clwyd – Ffynnon y Ddol	Traeth Pensarn SSSI, Kinmel Bay Nature Reserve	WFD protected area - Kinmel Bay bathing waters - need to reduce risks to bathing water status from any work (eg sediment). Clwyd opportunity catchment.	Potential link to green space at Parc Hanes via WG Land Division portfolio - contact Molly Lovatt	
NW25	Clwyd - Old Foryd Road		WFD protected area Rhyl bathing waters - need to reduce risks to bathing water status from any work (eg sediment)	Coastal footpath/accesses	
NW28	Criccieth	Pen Llyn a'r Sarnau SAC North Cardigan Bay SPA Glanllynau SSSI		Wales Coast Path	
NW30	Dinas Dinlle	Abermenai to Aberffraw Dunes SAC, Pen Llyn a'r Sarnau SAC, North Cardigan Bay SPA, Anglesey Coast Saltmarsh SAC, Menai Strait and Conwy Bay SAC		Wales Coast Path	
NW36	Fairbourne	Pen Llyn a'r Sarnau SAC/Mawddach Estuary North Cardigan Bay SPA	Cardigan Bay North coastal waterbody GB621009600000 moderate, driving elements Mercury;BDPE Calc	Wales Coast Path /public footpath/accesses	
NW37	Ffos Fawr Mochras Embankment - Gwehelog	North Cardigan Bay SPA, Pen Llyn a'r Sarnau SAC, Meirionnydd Oak Woods and Bat Sites SAC		Wales Coast Path /public footpath/accesses	



Ref	Location	Resilient Ecosystems (Aim 2)	Healthy Places WFD Status / Heavily Modified Waterbody (Aim 2)	Health & wellbeing, recreation, access (Aim 3)	Fisheries projects / River restoration /Opportunity catchment (Aim 4)
NW38	Harlech	Morfa Harlech a Morfa Dyffryn SAC North cardigan Bay SPA Pen Llyn a'r Sarnau SAC, Meirionnydd Oak Woods and Bat Sites SAC		Wales Coast Path /public footpath/accesses	
NW39, 40	Kinmel Bay	Traeth Pensarn SSSI, Kinmel Bay Nature Reserve	WFD protected area - Kinmel Bay bathing waters - need to reduce risks to bathing water status from any work (eg sediment)	Potential link to green space at Parc Hanes via WG Land Division portfolio - contact Molly Lovatt	
NW41	Llanbedr	North Cardigan Bay SPA, Pen Llyn a'r Sarnau SAC, Meirionnydd Oak Woods and Bat Sites SAC			
NW49	Llanfihangel-y-Traethau - Ty Gwyn Tidal Door	Pen Llyn a'r Sarnau SAC/Morfa Harlech SSSI	Unsure of exact location but looks like Morfa Harlech - Drain GB110065053500. HMWB. Moderate, driving elements DO;Temp;Mit_Assmnt. Leads to Glaslyn transitional waterbody GB511006507300 good status, driving elements Inverts;Hydro;Morph	Public/ Wales Coast Path	

Ref	Location	Resilient Ecosystems (Aim 2)	Healthy Places WFD Status / Heavily Modified Waterbody (Aim 2)	Health & wellbeing, recreation, access (Aim 3)	Fisheries projects / River restoration /Opportunity catchment (Aim 4)
NW54	Malltraeth	Abermenai to Aberffraw Sand Dunes SAC, Anglesey Coast Saltmarsh SAC, Glantraeth SAC Maltaeth Marsh SSSI	Cefni transitional waterbody GB521010207500, moderate, driving elements DIN;Mit_Assmnt	Wales Coast Path /cycle way/IDD	Llifo Mon, opportunity catchment work. Curlew tracking (Pat Lindley) inc possible marine team Natur am Byth work. Potential for wetland improvement (Tristan Hatton-Ellis).
NW58	Pennal	Aberdyfi SPA, Pen Llyn a'r Sarnau SAC	Pennal waterbody GB110064048360, moderate status, driving elements inverts.	Public footpath/WGW E	Ongoing NFM work in WGWE forestry.
NW59	Pontllyfni	Glynllifon SAC	Caernarfon Bay South coastal waterbody GB651010610000. Good status, driving elements Inverts; Phytoplankton	Wales Coast Path	
NW65	Talsarnau	Pen Llyn a'r Sarnau SAC, Meirionnydd Oak Woods and Bat Sites SAC Morfa Harlech SSSI	Tremadog bay coastal waterbody GB651009350000 good status, driving elements inverts Glaslyn transitional waterbody GB511006507300, good status, driving elements Inverts;Hydro;Morph	Wales Coast Path	

Ref	Location	Resilient Ecosystems (Aim 2)	Healthy Places WFD Status / Heavily Modified Waterbody (Aim 2)	Health & wellbeing, recreation, access (Aim 3)	Fisheries projects / River restoration /Opportunity catchment (Aim 4)
NW68/9	Trefriw		<p>Conwy transitional waterbody GB541006614800 HMWB (flood protection use). Moderate, driving elements BDPE Calc;Zinc;Mit_Assmnt. Conwy - tidal limit to Merddwr GB110066060030 moderate status, driving elements Cadmium and Zinc. Conwy transitional waterbody GB541006614800 HMWB (flood protection use). Moderate, driving elements BDPE Calc;Zinc;Mit_Assmnt</p>	Footpath/acces	<p>Within Conwy Opportunity Catchment (Llifo Conwy). Town has close links with Dyffryn Dyfodol project with Ffiwsar and Cartrefi Conwy. Llyn Colwyn Reservoir. Opportunity catchment</p>
NW70	Tywyn	<p>West Wales marine SAC, Pen Llyn a'r Sarnau SAC Fathew feeds into Broadwater SSSI</p>	<p>Fathew GB110064048410 - good, driving element hydro, morph. NEP submission for AMP8. Opportunity to work with DCWW re abstraction screening (point 23/64/13/0031).</p>	Wales Coast Path /access	

## Aim 1: Stocks of natural resources are safeguarded and enhanced

*Tackling overexploitation to ensure that natural resources are safeguarded, and where possible enhanced, to meet the needs of current and future generations and to contribute to ecosystem resilience. Non-renewable natural resources (such as, aggregates, fossil fuels) are used in a sustainable manner and, where depletion is unavoidable, substitutes are put in place to meet future needs.*

The **National Peatland Action Programme** is a 5 year plan (2020-2025) of peatland restoration in Wales. Welsh peatlands need urgent action to reverse habitat loss and their poor condition. They support a variety of habitats and species, and have an important role in:

- capturing and storing carbon
- regulating greenhouse gases
- maintaining biodiversity
- regulating water

The programme will have direct and indirect benefit for FRM in terms of mitigating and adapting to climate change. Where local FRMP measures are delivered downstream of NPAP projects opportunities could be identified to work together to align delivery and maximise benefits.

The Wales Environmental Information Portal contains the new [peat map](#) showing the locations of all Peatlands in Wales. This is being developed further to detail what restoration has happened and where. The portal also includes a layer for [opportunities for bog restoration for FRM](#). The maps show a significant area of peatlands are located in North West Place.

To determine any opportunities project managers should contact the NPAP team: [npap@naturalresourceswales.gov.uk](mailto:npap@naturalresourceswales.gov.uk).

## Aim 2: Ecosystems are resilient to expected and unforeseen change

*Building ecosystem resilience to safeguard and enhance supporting ecosystem services and tackling the impacts of habitat change, climate change, pollution, invasive alien species and other identified pressures resulting in Wales having resilient ecosystems*

There are numerous **nationally protected sites** across North West Wales. NSN Sites include the Pen Llyn a'r Sarnau SAC, which extends around much of the coast of North West Wales. When local measures are implemented, project level environmental assessment and Habitats Regulations Assessment will consider implications for sites such as those listed in Table 3, as well as considering whether projects can restore or improve any features.

The third cycle **River Basin Management Plan** (RBMP) established ten **Opportunity Catchments** across Wales. Opportunity Catchments (OpC) have been agreed as the delivery mechanism for the third cycle River Basin Management Plans (RBMP) (2021-27). The focus of OpC is to maximise multiple benefits for waterbodies, health and well-being, delivered through partnership working. OpC are a delivery mechanism to integrate RBMP with other work streams and to deliver the Natural Resources Policy priorities, such as delivery through nature-based solutions. Area Statements provide an important local steer having identified the local challenges and opportunities for each area. Anglesey catchments and the Conwy catchment are OpC in North West Place.

Table 3 identifies the Water Framework Directive (WFD) status of relevant waterbodies in North West Wales. Some of these are classified as **Heavily Modified Waterbodies** (HMWB). Some waterbodies might be classified as a HMWB as a result of their function as a flood risk asset. These might provide valuable social and economic benefits which it is vitally important to protect, so they have been designated as such under Article 4.3 of the WFD. There can still be opportunities to deliver mitigation measures in HMWB to help achieve Good Ecological Potential. Where FRMP measures are delivered in a HMWB, must seek opportunities to **deliver mitigation measures** identified for the HMWB.

Mitigation measures can include:

- Remove obsolete structure
- Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution
- Preserve/restore habitats
- In-channel morphological diversity
- Re-opening existing culverts
- Alter culvert channel bed
- Flood bunds (earth banks, in place of floodwalls)
- Set bank embankments

- Floodplain connectivity
- Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works.
- Management of the risk of fish entrainment in intakes for hydropower turbines or water resource purposes (or pumping stations) where there is downstream fish migration.
- Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone
- Operational and structural changes to locks, sluices, weirs, beach control, etc
- Selective vegetation control regime
- Appropriate vegetation control technique
- Appropriate timing (vegetation control)
- Appropriate techniques (invasive species)
- Retain marginal aquatic and riparian habitats (channel alteration)
- Sediment management strategies
- Appropriate channel maintenance strategies and techniques - minimise disturbance to channel bed and margins
- Appropriate channel maintenance strategies and techniques - e.g. remove woody debris only upstream of, or within, areas of urban flood risk. Can also include the use of gravel traps and maintaining sediment within the river system
- Appropriate water level management strategies, including timing and volume of water moved
- Appropriate techniques to align and attenuate flow to limit detrimental effects of these features (drainage)
- Educate landowners on sensitive management practices (urbanisation)

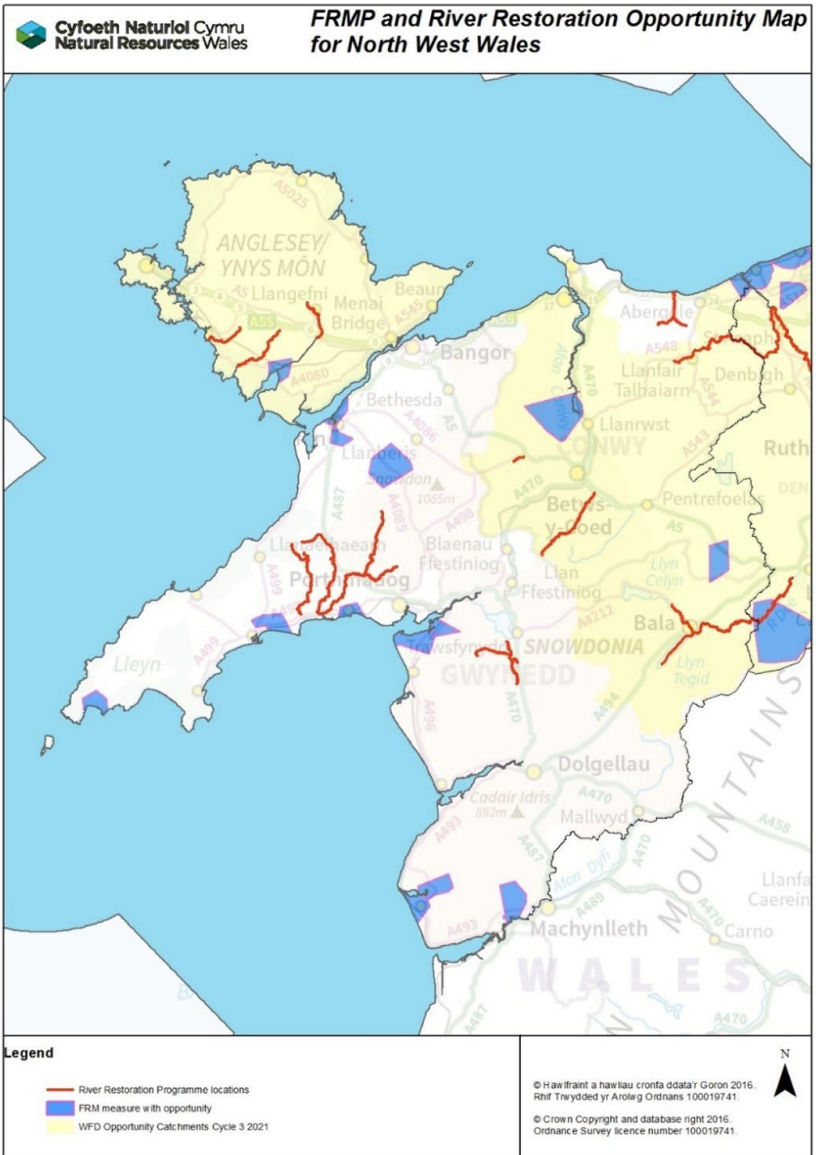
When projects are progressed there should be early discussion with the People and Places team to identify possible mitigation measures specific to each site. Through early consideration in the options appraisal there may be opportunities to include within the project design and business case.

**All projects being undertaken in the fluvial, estuarine or coastal environment must undergo WFD compliance assessment under OGN 72.**

The **River Restoration Programme** (RRP) identifies options that look to address physical modifications by naturalising watercourses and improving the resilience of habitats and biodiversity, as well as potentially reducing the local risk of flooding and improving water quality. NRW will work with partners and these gains will contribute towards the watercourses achieving their objectives under the WFD Regulations 2017.

The priority catchments for river restoration are shown in Figure 3. The blue polygons show the communities where FRMP local measures propose to undertake initial assessment and feasibility work for reducing flood risk, or design and construction of flood risk asset improvement. In some communities there is correlation with the RRP priority catchments, showing opportunities for FRM projects to deliver multiple benefits by working with the RRP. Conversely, some RRP activities include measures to slow and store water, including riparian habitat management and creation of offline storage areas which can help reduce flooding, improve water quality and increase biodiversity, delivering multiple benefits.





**Figure 3: Opportunity catchments and priority catchments for river restoration in North West Wales**

Many of the communities at risk in North West Place are coastal. The Marine Area Statement acknowledges that there are many locations around Wales which we must continue to defend in the future. This gives us many opportunities to consider using nature-based solutions for our coastal defences. In the options appraisal and design of local measures there must be consideration of **coastal adaptation** in line with SMP policy and where we are investing in a coastal defence, nature-based solutions must be considered and implemented where appropriate. The Area Statement supports the implementation of SMP policies, for example where policies move from hold the line to managed realignment in 2025. There are several locations in Table 3 where the proposed measures is to “Consider future management options and undertake coastal adaptation planning” during this cycle of the FRMP.

Where coastal defences must be maintained because of existing infrastructure and communities, nature based solutions must be considered. For instance, beach replenishment or saltmarsh development are natural coastal defences. Saltmarshes also offer the multiple benefit of being efficient carbon stores. Green-grey infrastructure solutions such as the use of ecological enhancement features can help to support improvements in biodiversity of coastal structures. [OGN 185 “Guidance to support the use of ecological enhancement features on coastal defence structures and assets”](#) should be considered for all coastal and estuarine projects.

### **Aim 3: Wales has healthy places for people, protected from environmental risks**

*Environmental regulation protects people from risks, such as air, water and noise pollution, flooding etc.  
Regulating and cultural ecosystem services are managed to increase wellbeing resulting in the provision of a healthy environment for all.*

Fundamentally, the FRMP local measures aim to manage flood risk in the communities considered at greatest risk. Many factors have an influence on our health and well-being, such as genetics, the environment, the society in which we live and work, income, behaviour patterns, and access to services. These significant and sustainable factors relate to what are known as the "Wider determinants of health", and should be considered as part of the commitment to the well-being of future generation and tackling inequalities. **The FRMP will contribute to Aim 3 by seeking to reduce the risk of flooding in these communities and consequently increasing well-being.**

Key to our understanding of populations and human health is the levels of deprivation experienced by local communities which can be explored through the Welsh Index of Multiple Deprivation: [WIMD - Home Page \(gov.wales\)](#)

Public Service Boards are responsible for producing **Well-being Assessments** and **Well-being Plans** that allow local organisations, including NRW, to work together to improve the well-being of people who live in their area. The plans prioritise what the PSB will focus on. In 2022 PSB's undertook / are undertaking an assessment of local well-being. The new draft Local Wellbeing Plans are due for public consultation in summer 2022, with an aim of publishing in 2023. PSBs relevant for North West Wales are:

[Gwynedd and Anglesey Well-being Plan](#)

[Conwy and Denbighshire Well-being Plan](#)

There are opportunities for local FRMP measures to contribute to local well-being plan objectives. For example: Objective 1 of Gwynedd and Anglesey PSB Well-being Plan is "Communities which thrive and are prosperous in the long term". Prioritising working together locally to mitigate the effects of climate change on our communities to achieve this objective. This is just one example. Each project level environmental assessment will consider the relevant Well-being Plan and identify opportunities to contribute.

The [Active Travel Act Guidance](#) has been produced by Welsh Government and is aimed at encouraging and facilitating walking and cycling. By encouraging such activities there can be direct benefits to health and well-being as well as providing alternatives to car travel. Achieving modal shift by displacing private car journeys with walking and cycling and public transport is at the heart of Llwybr Newydd, the Wales Transport Strategy. FRM projects should also seek to deliver opportunities such as designing in multi-user paths onto flood embankments.

Each Local Authority has an Active Travel Plan and the relevant ones for North West Wales can be found here:

[Gwynedd](#)

[Conwy](#)

[Ynys Mon](#)

At the early stages of a project we must check if there are plans for an active travel route in the area that could be accommodated or enabled by any flood risk engineering works.

There are numerous **designated landscapes** across North West Wales, including Snowdonia National Park, Anglesey **Area of Outstanding Natural Beauty** (AONB) and the Llyn Peninsular AONB. The North West also contains numerous **Special Landscape Areas** (SLA). This is a non-statutory designation applied by the local planning authority to define areas of high

landscape importance within their administrative boundary. Areas of high landscape importance may be designated for their intrinsic physical, environmental, visual, cultural and historical value in the contemporary landscape. Landscapes designated as a SLA may be unique, exceptional or distinctive to the local authority area.

Any projects located within these areas must be designed sensitively with their surroundings and in discussion with the relevant authorities to ensure the landscape is safeguarded and enhanced where possible.

There are also [Registered Historic Landscapes](#) and two [World Heritage Sites](#) in North West Wales: Gwynedd Castles and the Town Walls of King Edward and the recently inscribed Slate Landscape of Northwest Wales. There are multiple **Scheduled Ancient Monuments, Historic Parks and Gardens and listed buildings** in the communities at flood risk. There is also potential for **buried archaeology** which needs consideration in the delivery of projects. At initial assessment stage of projects it is standard practice to seek screening advice from Gwynedd Archaeological Trust (GAT), under the [Memorandum of Understanding](#) between NRW, Cadw and the Welsh Archaeological Trusts. GAT will scrutinise the Historic Environment Register and provide advice on the sensitivity of the study area for cultural heritage. This is done very early to ensure the project can be appraised and designed to avoid impact on the historic environment and seek opportunities to enhance cultural heritage.

## **Aim 4: Contributing to a regenerative economy, achieving sustainable levels of production and consumption**

*Reducing the environmental impact of production and consumption and our environmental footprint in Wales and beyond, meeting the Wellbeing Goals of delivering a prosperous and globally responsible country. Our aim is for Wales to use no more than its fair share of global resources in order for our economy to operate within the regenerative capacity of the Earth's ecosystems and make a positive contribution to global wellbeing.*

Welsh Government has an aspiration to create 43,000 hectares of new woodland by 2030 (and 180,000ha by 2050) to help Wales meet its carbon emission reduction targets. Woodlands provide many benefits to society, including slowing the flow of water and consequently moderating flood events. On the other hand, forest management practices such as cultivation, drainage, road construction and harvesting can have the opposite effect if not appropriately managed. The UK Forestry Standard (UKFS) recognises the potential of forestry to affect downstream flooding and includes a set of requirements and guidelines to ensure that forests, forestry management and woodland creation make a positive contribution. A new UKFS Practice Guide on designing and managing woodlands and forests to reduce flood risk is due for publication in 2022/23. FRM capital projects, by their nature, often result in the removal of trees to make space for access and/or construction. The project environmental assessment will seek to

minimise such loss and to mitigate, where necessary, by planting trees. There might also be opportunities to further enhance the environment and contribute to Welsh Government's ambition for **woodland creation** through capital project delivery, particularly if they are in locations that might reduce run-off. FRM projects, by their nature are often in urban environments and securing land for tree planting is often high risk and high cost. Delivering tree planting and woodland creation more strategically through NRW's **Woodland Creation Programme**, as well as **Welsh Government's National Forest programme** and the Sustainable Farming Scheme in due course, could provide benefits for both FRM and Wales as a whole. For further opportunities at a project level, contact NRW's woodland creation hub: [WoodlandCreation.Hub@cyfoethnaturiolcymru.gov.uk](mailto:WoodlandCreation.Hub@cyfoethnaturiolcymru.gov.uk)

**Forest Resource Plans (FRPs)** are 30year plans that set out the framework for management of the WGWE. They detail what work will be carried out and when. These programmes of work are developed to meet the forest objectives, which are created based on policy guidance and Area Statements. They are refined through coupe plans and detailed site plans for operational delivery. Following the 2020 floods NRW's Land Estate Management Review found that forests influence water in a mostly positive way, evidence suggests that they do not have a significant modifying effect during major flood events, regardless of management practice. However, in some smaller catchments where forestry is the dominant land use, woodland can have a positive effect during less extreme conditions. Work we can carry out on our land to hold and delay the release of water could contribute positively to flood management downstream, especially when combined with other catchment wide actions and when considering the future implications of climate change. The FRMP identifies those communities at greatest flood risk across Wales and linking with the relevant [Forest Resource Plan](#) at a strategic or local scale could encourage integrated planning and delivery of wider benefits, in line with the recommendations of the review.