

Conwy Local Flood Risk Management Strategy

Strategy Document

February 2013
Conwy County Borough Council



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Glossary and Abbreviations of words and phrases commonly used in flood and coastal erosion risk management

| Term | Meaning / Definition |
|--|--|
| Act | A Bill approved by both the House of Commons and the House of Lords and formally agreed to by the reigning monarch (known as Royal Assent). |
| Aquifer | A layer of porous substrate that contains and transmits groundwater. |
| AONB | Area of Outstanding Natural Beauty. |
| AMP | Asset Management Plan periods – Water Industry operates in five year cycles, where by the companies set their prices for the five year cycle. |
| Asset Register | Register of structures or features which are considered to have an effect on flood risk. |
| Bill | A proposal for a new law or a proposal to change an existing law that is presented for debate before Parliament. |
| BGS | British Geological Survey. |
| Building Regulations | The UK Building Regulations are rules of a statutory nature to set standards for the design and construction of buildings. Primarily to ensure the safety and health for people in and around those buildings, but also for the purposes of energy conservation and access to and about other buildings. |
| Cadw | Cadw is the Welsh Government's historic environment service. |
| Catchment | An area that serves a river with rainwater; that is, every part of land where the rainfall drains to a single watercourse is in the same catchment. |
| CFMP | Catchment Flood Management Plan – plans that provide an overview of the flood risk across each river catchment and estuary. They recommend ways of managing those risks now and over the next 50-100 years. |
| Climate Change | The change in average conditions of the atmosphere near the Earth's surface over a long period of time. |
| CCRA | Climate Change Risk Assessment. |
| Coastal Erosion | The wearing away of coastline, usually by wind and/or wave action. |
| Coastal Erosion Risk | Measures the significance of potential coastal erosion in terms of likelihood and impact. |
| Coastal Erosion Risk Management | Anything done for the purpose of analysing, assessing and reducing a risk of the wearing away of coastline. |
| Coastal Flooding | Occurs when coastal defences are unable to contain the normal predicted high tides that can cause flooding, possibly when a high tide combines with a storm surge (created by high winds or very low atmospheric pressure). |
| Coastal Squeeze | Where the coast is protected by engineering structures, the rising sea level results in a steepening of the intertidal profile, known as coastal squeeze. |

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| Term | Meaning / Definition |
|---|---|
| Community Infrastructure Levy | A mechanism for raising additional funding at the local level. |
| Consenting | Process of obtaining permission to add/amend structures in/near a watercourse or flood defence structure. |
| CRR | Community Risk Register. |
| CCBC | Conwy County Borough Council. |
| CCW | Countryside Council for Wales – is the Government’s statutory advisor on sustaining natural beauty, wildlife and the opportunity for outdoor enjoyment on Wales and its inshore waters. |
| Critical National Infrastructure | Infrastructure that supplies essential services, e.g. water, energy, communications, transport etc. |
| Cultural Heritage | Buildings, structures and landscape features that have an historic value. |
| Culvert | A covered structure under road, embankment etc, to direct the flow of water. |
| Defences | A structure that is used to reduce the probability of floodwater or coastal erosion affecting a particular area. |
| Defra | Department for Environment, Food and Rural Affairs. |
| Deposition | The process whereby sediment is placed on the sea bed, shoreline, river bed or flood plain. |
| DG | Director General – is the professional head of an executive agency. |
| Draft Bill | A Bill published in draft before introduction before Parliament. |
| DCWW | Dŵr Cymru Welsh Water – supplies water, sewerage and trade effluent services in Wales |
| EA / EAW | Environment Agency and Environment Agency Wales - Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs and a Welsh Government sponsored Public Body responsible to the Welsh Ministers. |
| ESF | Environment Social Fund. |
| ERDF | European Regional Development Fund. |
| EU | European Union. |
| Flood | Any case where land not normally covered with water becomes covered by water. |
| FCERM | Flood & Coastal Erosion Risk Management. |
| FAG | Flood Alleviation Grant. |
| FDGiA | Flood Defence Grant in Aid. |

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| Term | Meaning / Definition |
|---------------------------------------|---|
| FFS | Flood Feasibility Study. |
| FIR | Flood Investigation Report. |
| Flood Risk | Product of the probability of flooding occurring and the consequences when flooding happens. |
| Flood Risk Management | The activity of understanding the probability and consequences of flooding, and seeking to modify these factors to reduce flood risk to people, property and the environment. This should take account of other water level management and environmental requirements, and opportunities and constraints. |
| Flood Risk Management Measures | The way in which flood risks are to be managed. |
| Flood Risk Management Wales | The Regional Flood and Coastal Committee (RFCC) for Wales. |
| Flood Risk Regulations 2009 | Regulations which transpose the EC Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) into domestic law and to implement its provisions. |
| Floodline Warnings Direct | Is a free service that provides flood warnings direct to you by telephone, mobile, email, SMS text message and fax. |
| FWMA | Flood and Water Management Act 2010 - An Act of Parliament updating and amending legislation to address the threat of flooding and water scarcity, both of which are predicted to increase with climate change. |
| Fluvial Flooding | Flooding from rivers including ordinary watercourses and main rivers. |
| FCW | Forestry Commission Wales – Government Body Responsible for managing Britain’s public forests . |
| Groundwater | Water held underground in the soil or in pores and crevices in rock. |
| Groundwater Flooding | Occurs when water levels in the ground rise above the natural surface. Low lying areas underlain by permeable strata are particularly susceptible. |
| LDP | Local Development Plan. |
| LDC | Land Drainage Consent. |
| Local Flood Risk | Defined within the Flood and Water Management Act 2010 as including surface runoff, groundwater and ordinary watercourses. |
| LFRRMS | Local Flood Risk Management Strategy - Required in relation to Wales by Section 10 of the Flood and Water Management Act 2010 Local Flood Risk Strategies are to be prepared by Lead Local Flood Authorities and must set out how they will manage local flood risks within their areas. |
| LLFA | Lead Local Flood Authority - the County Council or the County Borough Council for the area (Local Authority). |

Conwy Local Flood Risk Management Strategy

| Term | Meaning / Definition |
|-----------------------------|--|
| LRF | Local Resilience Forum - A group required under the Civil Contingencies Act, 2004 who are responsible for the coordination of emergency planning in local areas. |
| Main River | A watercourse shown as such on the Main River Map, and for which the Environment Agency has responsibilities and powers. |
| Managed Realignment | A coastal defence technique which aims to achieve sustainable flood defence by recreating eroded salt marsh and mudflat habitats. |
| NPPF | National Planning Policy Framework – Document that rationales the planning legislation. |
| NMWTRA | North & Mid Wales Trunk Road Agency – responsible for the maintenance of the trunk roads in Conwy. |
| NWRF | North Wales Resilience Forum – made up of strategic level managers of each of the Category 1 responders (Local Authority, Emergency Services, and Local Health Boards) to ensure that there is an appropriate level of preparedness to enable an effective multi-agency response to an emergency. |
| Ofwat | Water Services Regulation Authority – the body responsible for economic regulation of the privatised water and sewerage industry in England and Wales. |
| Ordinary Watercourse | All watercourses that are not designated Main River, and which are the responsibility of riparian landowners. |
| Outcome | Conwy County Borough Council's alternative naming of 'Objective'. |
| PDZ | Policy Development Zone. |
| PPG25 | Planning Policy Guidance 25: Policy relating to development in areas of flood risk in England (2001) – Superseded by PPS25. |
| PPS | Planning Policy Services – department within the local authority that deals with planning policy in Conwy County Borough Council. |
| PPS25 | Planning Policy Statement 25: Policy relating to development in areas of flood risk in England (2006). |
| PFRA | Preliminary Flood Risk Assessment. |
| Recovery | The process of rebuilding, restoring and rehabilitating the community following an emergency. |
| RWA | Regional Water Authorities. |
| RFCC | Regional Flood and Coastal Committee - An Environment Agency committee, responsible for consenting medium and long term plans and operational plans to the Agency's Board and Head Office. Monitors and reports on progress. In Wales there is only one RFCC and this is the FRMW (Flood Risk Management Wales) Group. |
| Reservoir | An artificial lake where water is collected and stored until needed. Reservoirs can be used for irrigation, recreation, providing water for municipal needs, hydroelectric power or controlling water flow. |
| Residual risk | The risk that remains after risk control measures have been put in place. |

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| Term | Meaning / Definition |
|--------------------------------|--|
| Resilience | The ability of the community, services, area or infrastructure to avoid being flooded, lost to erosion or to withstand the consequences of flooding or erosion taking place. |
| RSG | Revenue Support Grant. |
| Risk | Measures the significance of a potential event in terms of likelihood and impact. In the context of the Civil Contingencies Act 2004, the events in question are emergencies. |
| Risk Assessment | A structured and auditable process of identifying potential significant events, assessing their likelihood and impacts and then combining these to provide an overall assessment of risk to inform further decisions and actions. |
| Risk Management | Anything done for the purpose of analysing, assessing and reducing a risk. |
| RMA | Risk Management Authority - A Welsh risk management authority is defined in Section 6 of the Flood and Water Management Act 2010 as the Environment Agency, a Lead Local Flood Authority, a district council for an area for which there is no unitary authority, an IDB for an internal drainage district that is wholly or mainly in Wales and a water company that exercises functions in relation to an area in Wales. |
| Risk Management Schemes | A range of actions to reduce flood frequency and/or the consequences of flooding to acceptable or agreed levels. |
| River flooding | Occurs when water levels in a channel overwhelms the capacity of the channel. |
| Roll Back | As natural defences fail the coast will 'roll back' naturally, creating an opportunity for the expansion of intertidal and coastal habitats. |
| Royal Assent | Method by which the constitutional monarch formally approves an act of parliament. |
| Sewer | An artificial conduit, usually underground, for carrying off sewage (foul sewer) or rainwater (storm or surface water sewer) or both (combined sewer). |
| SMP | Shoreline Management Plans - A large-scale assessment of the risks associated with coastal processes and helps reduce these risks to people and the developed, historic and natural environments. |
| SEA | Strategic Environmental Assessment. An SEA is a system of incorporating environmental considerations into policies, plans, programmes and strategies. |
| SFRA | Strategic Flood Risk Assessment. |
| SuDS | Sustainable Drainage Systems - Approach to surface water management which helps to deal with excesses of water by mimicking natural drainage processes and patterns. |
| Surface Water Flooding | In the urban context, usually means that surface water runoff rates exceed the capacity of drainage systems to remove it. In the rural context, it is where surface water runoff floods something or someone. |
| Surface Water Runoff | This occurs when the rate of rainfall exceeds the rate that water can infiltrate the ground or soil and flows over ground. |
| SWMP | Surface Water Management Plan. |

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| Term | Meaning / Definition |
|---|--|
| SAB | SuDS Approval Body. |
| TAN 14: Coastal Planning | Technical Advice Note 14 supports Planning Policy Wales and covers all aspects of planning for new development and the coastal zone. |
| TAN 15: Development & Flood Risk | Technical Advice Note 15 supports Planning Policy Wales and makes it clear how local authorities should make decisions about different types of development on flood plains, providing clear tests for justification and acceptability of flooding consequences, and enabling the consideration of risks over the lifetime of the new development. |
| UKCP09 | United Kingdom Climate Projections – is the working name for the UK Climate Projections, which forecasts the potential impacts of future climate change based on sound science. |
| Wales Flood Group | A sub group of a Wales Resilience Forum. |
| Watercourse | A channel natural or otherwise along which water flows. |
| Water Company | A company which holds an appointment under Chapter 1 of Part 2 of the Water industry Act 1991 or a licence under Chapter 1A of Part 2 of that Act. |
| WFD | Water Framework Directive. |
| WG | Welsh Government. |
| WLGA | Welsh Local Government Association - Represents the interests of Local Authorities in Wales. The three fire and rescue authorities, four police authorities and three national park authorities are associate members. |
| Welsh Risk Management Authorities | Risk Management Authorities as defined in Section 27 of the Flood and Water Management Act 2010. |

Executive Summary

Conwy County Borough Council (CCBC), as a Lead Local Flood Authority (LLFA) is required to prepare a Local Flood Risk Management Strategy. The purpose of the Local Strategy is to address potential flood risk arising from local sources within the boundaries of the Authority area. An important part of the Local Strategy will be to ensure that our communities are aware of what risks exist, aware of what the Council and other Risk Management Authorities' responsibilities are in terms of flood risk and what communities can do to involve themselves.

The Local Strategy will complement and support the National Strategy published by Welsh Government, which outlines a national framework for flood and coastal risk management, that aims to balance the needs of communities, the economy and the environment. *The National Strategy for Flood and Coastal Erosion Risk Management (Wales)* sets the following objectives:

1. **Reducing the impacts** on individuals, communities, businesses and the environment from flooding and coastal erosion;
2. **Raising awareness** of and engaging people in the response to flood and coastal erosion risk;
3. **Providing an effective and sustained response** to flood and coastal erosion events; and
4. **Prioritising investment** in communities most at risk.

The Local Strategy aims to pull together the existing policies and actions the Authority undertakes which have implications with regard to flood risk management. It also describes any new actions or policies introduced as a result of the Flood and Water Management Act 2010 and Flood Risk Regulations 2009 and also any proposed actions or policies to be introduced to further manage flood risk.

The LLFA must specify objectives to manage flood risk and suggest measures to achieve those objectives. The Local Strategy must show how and when any measures are to be introduced and how they will be funded. The implementation and funding of some of the proposed actions may not be clear at this stage, as they involve sections of the Flood and Water Management Act 2010 which have not yet been implemented.

The LLFA has a responsibility to consider the flood risk management functions that it may exercise to reduce the impact and risk from flooding. In support of the aim of a general reduction of flood risk across the district, the LLFA will prioritise investigations and works identified in this strategy to the best of its abilities, based on perceived and evidenced risk and with limited resources.

Considering the current pressures on public funding, the money available for addressing flood risk is unlikely to be adequate and pressures will only increase with rising future risk brought about by further development and a changing climate. As such, flood risk management will need to be supplemented by everyone working together and by those at risk from flooding taking responsibility to protect and help themselves.

1. Introduction

Around 220,000 properties in Wales, or about one in six buildings, are at risk of flooding, of which 64,000 are at significant risk. 97,000 of these are also vulnerable to surface water flooding with a further 137,000 properties susceptible to surface water flooding alone.

*Flooding in Wales – National Assessment of Flood Risk
Environment Agency*

1.1 Introduction

The increase in occurrence and severity of flooding in recent years including that of summer 2007 sparked a government-commissioned investigation into the flooding, known as the Pitt Review¹. It summarised the failings of historic flood management, resulting in an extensive set of recommendations which were transposed into the Flood and Water Management Act 2010² (FWMA). The FWMA created a responsibility for County and Unitary Councils to act as Lead Local Flood Authorities (LLFA's) which meant they were required to take leadership for the coordination and management of local flood risk.

Conwy County Borough Council (CCBC) has been designated as a LLFA in Wales, and is required under Section 10 of the FWMA to develop, maintain, apply and monitor a Local Flood Risk Management Strategy (LFRMS) in its area. The purpose of the LFRMS is to address potential flood risk arising from local sources within the boundaries of the Local Authority area. Local flood risk is defined as any flood risk from surface runoff, groundwater and ordinary watercourses. An ordinary watercourse is defined (in the Water Resources Act 1991) as any watercourse, including lakes and ponds that is not classified as a main river.

It is likely that changes in our climate, such as increased severity of storms and wetter winters, will increase the risk and impact of flooding. Flooding already poses a serious risk to the people, economy and environment of Conwy and climate change is expected to increase this risk, as well as the rate of coastal erosion, in the coming decades³. Communities at risk of flooding and coastal erosion can expect to see those risks realised more frequently and the magnitude of the impacts to be increased. It will not be possible simply to continue to build more and bigger drainage systems and defences in response to this increased risk; the response has to be rooted in the principles of risk management, providing a holistic approach to identifying flooding issues, and managing the risks, and their consequences.

This flood risk strategy begins a new chapter of Flood and Coastal Erosion Risk Management (FCERM) for Conwy. It highlights the steps that are to be taken to improve knowledge of flood risk in the county, to work better with organisations and the public towards reducing those risks whilst aiming to balance the need of communities, the economy and the environment.

The strategy document starts with information on the legislation that underpins FCERM activities, the nature of flood risks in Conwy and what further information is needed to help build a better picture of local flood risks. It then identifies the authorities and organisations involved and what part each will play in helping reduce the risk of flooding in Conwy. The next section will describe the strategic outcomes (CCBC alternative naming for objectives) for managing flood risk and the measures that might be implemented to

¹ The Pitt Review; Learning Lessons from the 2007 Floods - Full Report

² Her Majesty's (HM) Government (2010) Flood and Water Management Act

³ Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales, December 2011

achieve them. This will be supplemented by annual action plans in order to give a more detailed overview of what CCBC want to achieve that year and how it will be undertaken.

Considering the current pressures on public funding, the money available for FCERM is unlikely ever to be adequate to deal with all existing flood risks and the increasing future risk brought about by further development and a changing climate. As such, flood risk management will need to be supplemented by everyone working together and by those at risk from flooding taking responsibility to protect and help themselves.

1.2 Strategic Environmental Assessment

A Strategic Environmental Assessment (SEA) is being undertaken to ensure that any significant environmental effects arising from this strategy are identified, assessed, mitigated, communicated to decision-makers, monitored and that opportunities for public involvement were provided.

SEA is a generic tool that was introduced by the European Union Directive 2001/42/EC. The objective of the Strategic Environmental Assessment Directive is to “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development (Article 1)”.

This requires national, regional and local strategic environmental assessment on certain plans and strategies that they promote, such as this strategy. Monitoring of the significant environmental effects of implementing the strategy will be undertaken to comply with Strategic Environmental Assessment Directive - Article 10.1, to ensure that any unforeseen adverse effects of the local strategy are recognised and dealt with.

The SEA for this strategy has been carried out as the document has developed. The SEA has been undertaken in line with Government Guidance. Statutory Consultees (Environment Agency Wales, Countryside Council for Wales and Cadw) have been consulted and the public have had an opportunity to comment, and these comments have been incorporated into the final Environmental Report.

1.3 Habitats Regulations Assessments

Under the European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (also known as the ‘Habitats Directive’), and the resulting Conservation of Habitats and Species (Amendment) Regulations 2012, a Habitat Regulations Assessment (HRA) is required where a plan may give rise to potential significant effects on European designated sites, known as Natura 2000 sites.

Natura 2000 sites consist of Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites and also include potential SPA (pSPA) and candidate SAC (cSAC). Within and surrounding the county there are a number of SPA’s and SAC’s, and therefore a HRA Stage 1 ‘Test of Likely Significant’ (Screening) has been undertaken to determine whether there are likely to be any significant effects on Natura 2000 sites from the LFRMS. A Screening Report was produced and will be consulted upon by Countryside Council for Wales (CCW). The screening has concluded that a Stage 2 ‘Appropriate Assessment’ will not be required.

2. Guiding Principles

The following are the guiding principles which flood risk management in Conwy will be based on:

- Floods are natural events and will continue to occur, regardless of any efforts to prevent them. The danger from flooding will never be eliminated and therefore it is important to focus as much on reducing the disruption that flooding causes as on measures to prevent it;
- There are opportunities to derive significant benefits in the wider context of sustainability, environmental and social improvement in the FCERM function;
- The public and private costs created from flood damage can be reduced in the long term by effective flood risk management;
- The decisions on where local resources are focused should be evidence-based and made against clear justifiable criteria;
- The level of knowledge about flood risk across all stakeholders needs to be improved;
- To ensure the long term success of flood risk management across Conwy County, all relevant organisations and public funded bodies will have to work collectively to manage the risks of flooding;
- No organisation is able to ensure that all households and businesses are safe from flooding. Household and business holders have responsibility for protecting their properties, but the relevant public organisation has a duty to inform property owners of their risk and advise what steps they can take to make their property more resilient;
- Encourage an increase in total investment in flood risk management beyond levels provided by the Welsh Government (WG) alone;
- New developments should look not only to ensure that there is no increase in flood risk but where practical, it should improve the flood risk currently there;
- To take a more sustainable approach to flood risk management at a catchment level; considering natural land use management techniques, such as managing flood plains and restoring wetlands and upland woodlands;
- The cumulative impact of small developments on flood risk shall be assessed with a similar significance as major developments, to ensure the threat of flood risk doesn't increase; and
- Climate change and how it could affect future flood and erosion risk needs greater understanding and all options should be appraised to enable adaptation to changing risk.

3. Legislative Context

3.1 History of Flood Risk Management

The responsibility for flood risk management has changed considerably over the past 30 years. Prior to 1989, the regulation of national environmental issues (including flood risk management, drainage and water quality) was carried out by ten Regional Water Authorities (RWAs). The Welsh National Water Development Authority (which came into existence by virtue of the Water Act 1973) covered the area which is now CCBC. In 1989 the National Rivers Authority was set up, a national body that took over the roles and responsibilities for flood risk management, drainage and water quality in England and Wales. The Water Act 1989 was passed by Government which privatised the Water Supply and Sewerage functions of the Water Authorities with Dŵr Cymru Welsh Water (DCWW) becoming a PLC (Since 2001 DCWW has been owned by Glas Cymru, a company limited by guarantee).

In December 1991, a number of pieces of legislation were enacted which aimed to consolidate existing water legislation. Most relevant in terms of flood risk management were the Land Drainage Act, which outlined the duties and powers to manage land drainage for a number of bodies including internal drainage boards and Local Authorities, and the Water Resources Act, which outlined the roles and responsibilities of the National Rivers Authority. The Statutory Water Companies Act and the Water (Consequential Provisions) Act were also enacted at the same time.

The Environment Agency⁴ (EA) was established by the Environment Act in 1995. The EA came into existence on 1st April 1996 and took over the roles and responsibilities of the National Rivers Authority and also the responsibility for issuing flood warnings, a role previously held by the police. The management and operation of the Environment Agency is divided into a number of regions across the country; the county of Conwy falls within the Environment Agency Wales region.

Within England and Wales, recent flood risk management policy changes were accelerated by major flood events in 1998 and 2000, which led to the release of Planning Policy Guidance 25 (PPG25): Development and Flood Risk in England during 2001. Technical Advice Note 15 (TAN15), the Welsh equivalent of PPG25 was released in 2004 and aims to direct development away from areas of high flood risk with justification and assessment of consequences required if this cannot be achieved. TAN15 also encourages Sustainable Drainage Systems (SuDS) to be implemented for any development where they will be effective.

In England Planning Policy Statement 25 (PPS25) superseded PPG25 in 2006 and reinforced the requirement for sustainable surface water management in new developments. This has now been replaced by the National Planning Policy Framework (NPPF) which looks to rationalise the amount of planning legislation and bringing it all together in one coherent document. The Wales Office⁵ has welcomed the changes to the English planning guidelines and encourages the Welsh Government to seek to adopt these measures.

⁴ An Executive Non-departmental Public Body responsible to the Secretary for Environment, Food and Rural Affairs and in Wales a Welsh Government Sponsored Body responsible to the Minister for Environment and Sustainable Development

⁵ The Wales Office supports the Secretary of State for Wales

3.2 The Flood and Water Management Act 2010

Following Royal assent in April 2010 The Flood & Water Management Bill became an Act of Parliament. The Act reinforces the need to manage flooding in a holistic and sustainable manner and places a number of new roles and responsibilities on councils such as Conwy, which is designated as a Lead Local Flood Authority under the FWMA extending their previous responsibilities for flood risk management. The preparation of this LFRMS is just one of the duties placed upon CCBC under this piece of legislation.

There are two key drivers behind the new legislation; one being the review in to the summer 2007 floods by Sir Michael Pitt, most often referred to as the Pitt Review. The other key driver behind the Act is the EU Floods Directive which has been transposed into UK law by the Flood Risk Regulations, 2009. Both of which are summarised in the following sections:

3.3 The Pitt Review

Sir Michael Pitt carried out an independent review of national FCERM practices after the widespread and catastrophic floods during the summer of 2007, in which over 55,000 households were affected and damages exceeded £4 billion⁶. The Pitt Review was published in June 2008 and called for urgent and fundamental changes to the way flood risk was being managed. The report contained 92 recommendations for the Government, Local Authorities, Local Resilience Forums and other stakeholders which were based around the concept of Local Authorities playing a major role in the management of local flood risk, through coordinating with all relevant authorities. Many of the recommendations contained in the Pitt Review have been enacted through the Flood and Water Management Act.

3.4 The Flood Risk Regulations 2009

The Flood Risk Regulations (FRR) came into force in December 2009 and transpose the EU Floods Directive into law for England and Wales. The Flood Risk Regulations require three main pieces of work:

Preliminary Flood Risk Assessment (PFRA) – This involves collecting information on past and future floods from surface water, groundwater and ordinary watercourses, assembling the information into a PFRA report and identifying Indicative Flood Risk Areas⁷. No Indicative 'Flood Risk Areas' were identified in Conwy County. The PFRA for Conwy County has been completed and can be found on the Environment Agency website and Conwy County Borough Council website.

Flood Hazard and Flood Risk Maps – Any authorities identifying an Indicative Flood Risk Area are required to produce hazard and risk maps for those areas by 22nd December 2013.

Flood Risk Management Plans – The final stage is for authorities with an Indicative Flood Risk Area to produce a Flood Risk Management Plan for those areas by 22nd December 2015.

⁶ The Costs of the summer 2007 floods in England – Environment Agency (Project: SC070039/R1) Published January 2010

⁷ Flood Risk Area is defined in the report as an affected population greater than 5,000 people at risk, as defined in the WAG/ Defra guidance document 'Selecting and Reviewing Flood Risk Areas for local sources of flooding – Guidance for Lead Local Flood Authorities'.

The PFRA did not identify any 'Flood Risk Areas' within Conwy County. Flood Risk Areas termed in the PFRA have been defined by Welsh Government guidance as an affected population greater than 5,000 people at risk. Under this guidance, three clusters were identified by EAW within CCBC located within Llanrwst, Colwyn Bay and Abergele. However, all of the affected clusters fell beneath the population threshold of 5,000, and as such fell outside the regulations and were not considered to be Flood Risk Areas. As such CCBC are not required under the FRR to undertake the flood hazard and flood risk maps and flood risk management plans, however CCBC still intend to produce them for areas in the county known to be at risk of significant flooding.

These pieces of work are to be reviewed on a six yearly cycle so CCBC will revise the PFRA by 2017. Should this review identify a Flood Risk Area, further flood hazard and flood risk maps and flood risk management plans will need to be completed during this cycle. It is proposed that a review of the Local Strategy should take place in 2017 following the review of the National Strategy in 2016, and to coincide with the review of the PFRA.

3.5 The National Strategy for Flood and Coastal Erosion Risk Management

The Flood and Water Management Act 2010 requires the Welsh Government (WG) to develop, maintain, apply and monitor a National Strategy for flood and coastal erosion risk management in Wales. It can be found at the following location:

<http://wales.gov.uk/docs/desh/publications/111114floodingstrategyen.pdf>

The National Strategy sets four overarching objectives for the management of flood and coastal erosion risk in Wales, which are as follows:

- 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;
- Providing an effective and sustained response to flood and coastal erosion events; and
- Prioritising investment in the most at risk communities.

Implementing these objectives will be the responsibility of everyone involved in or affected by flood and coastal erosion risk management, from the WG to the Welsh Risk Management Authorities and the people of Wales themselves.

The FWMA states that Local Strategies must be consistent with the National Strategy for Wales. Being consistent ensures that the strategic aims and objectives in the National Strategy are translated into meaningful objectives for their own particular area.

The WG have a wide range of measures which they propose will meet their objectives. The following measures have been assigned to LLFA to lead delivery on:

- Development of Local Flood Risk Management Strategies;

- Implementation of statutory responsibilities including those set out within the Flood and Water Management Act 2010 and the Flood Risk Regulations 2009;
- Approval and adoption of SuDS drainage systems by the SuDS Approving and Adopting Body;
- Development of a register of natural and manmade structures or features likely to have an effect on flood risk;
- Establishment of a programme of regular and appropriate maintenance for flood and coastal erosion risk management assets (for assets owned by the LLFA);
- Designation of natural and manmade structures or features likely to have an effect on flood or coastal erosion risk over the life of the Strategy;
- Programme of community based awareness and engagement activities, utilising the Flood Risk Management Community Engagement Toolkit (in partnership with the Environment Agency);
- Identification of at risk groups within communities, including vulnerable individuals;
- Development of procedures for the effective clearance of debris (following a flood event);
- Development of repair schedules including provision for the installation of resilient measures; and
- Investigations into the causes of flooding to be undertaken where necessary within one month.

There are additional measures for local authorities in their capacity as local planning authority and as Category 1 responder under the Civil Contingencies Act 2004.

3.6 Other Legislation

Flood Risk Management is affected by a range of other legislation. Which are considered to include (but not limited to) the following:

- The Climate Change Act 2008;
- The Civil Contingencies Act 2004;
- The Strategic Environmental Assessment (SEA) Directive 2001;
- The Conservation of Habitats and Species (Amendment) Regulations 2012;
- The Land Drainage Act 1991;
- The Water Framework Directive 2007;
- Wildlife and Countryside Act 1981;
- Countryside and Rights of Way Act 2000;

Conwy Local Flood Risk Management Strategy

- Coast Protection Act 1949;
- Natural Environment and Rural Communities Act 2006;
- Public Health Act 1936; and
- Highways Act 1980.

4. Flood Risk in Conwy

4.1 Introduction

The European Union (EU) Floods Directive defines a flood as a covering by water of land not normally covered by water. It can occur from a number of sources, including rivers, the sea, small local watercourses, below ground drainage systems and direct surface water run-off. Understanding both the sources of and reasons for flooding, ensures that CCBC can take steps to manage and reduce the risks of flooding. Flood risk is the product of the likelihood or chance of flooding, multiplied by the consequences or impacts of flooding.

The likelihood (or chance) of flooding occurring in any one year can be expressed as a probability or an annual chance. For example:

- A 1% annual probability of flooding; or
- A 1 in 100 chance of flooding at a location in any year.

The consequences (or impacts) of flooding can have serious effects not only on people and property, but also on essential services, infrastructure and the environment.

4.2 Local Flood Risk

Conwy has experienced some extensive flooding in the past; the areas of widespread flooding have occurred in the coastal town of Towyn in February 1990 where some 2,800 properties were affected by flooding. More recently, repeated flooding to the Conwy Valley in 2004 and 2005 seriously affected the people and businesses of Llanwrst and Trefriw.

Below is a table illustrating examples of significant flood events that have occurred in Conwy County over the recent years. It should be noted that the list provided is not a comprehensive list of all flooding that has occurred in Conwy:

| Year of Flood | Area Affected | Type of Flood | Consequence |
|---------------|--------------------------------------|---------------|---|
| 1990 | Towyn | Coastal Storm | A combination of gale-force winds, a high tide and rough seas caused Towyn's flood defences to be breached in February 1990, 4 square miles of land was flooded, affecting 2,800 properties and causing areas to be evacuated. |
| 1993 | Llandudno, Llandudno Junction, Conwy | Surface Water | Torrential rainfall estimated as having a 1 in 1000 chance of occurrence per year in Llandudno caused surface water flooding to much of Llandudno and to a lesser extent to surrounding towns. Problems were exacerbated in Llandudno due to pumping station failures caused by the flooding. |
| 2000 | Old Colwyn | Surface | Surface Water flooding occurred at Peulwys Estate due |

Conwy Local Flood Risk Management Strategy

| | | | |
|------|---|--|---|
| | | Water | to lack of capacity in the drainage system. 25 properties were affected. |
| 2001 | Abergele, Glan Conwy, Old Colwyn, Mochdre, Glanwydden, Melin y Coed, Penmaenmawr, Towyn, Conwy Morfa and Llanfairtalhaiarn | Fluvial | River flooding affected many areas of the county with some surface water problems also in Abergele, Melin y Coed and Glan Conwy. Over 100 properties affected with Abergele (39 properties), Glan Conwy (18 properties) and Old Colwyn (16 properties) worst affected. |
| 2002 | Penmaenmawr, Abergele, Glan Conwy, Llanrwst | Fluvial | River flooding affected 14 properties mostly in Penmaenmawr (9 properties) |
| 2004 | Conwy Valley, Llanrwst, Trefriw, Llandudno, Colwyn Bay, Llanfairfechan, Penmaenmawr, Conwy, Mochdre, and Abergele. | Fluvial Fluvial / Surface Water | Flooding of approximately 80 properties in the Conwy Valley occurred in February due to overtopping of the River Conwy. A combination of river and surface water flooding occurred throughout the county during October affecting approximately 100 properties. The worst affected areas were Llanrwst (20 properties – fluvial), Penmaenmawr /Dwygyfylchi (27 properties – surface water), Colwyn Bay / Mochdre (14 properties – fluvial and surface water), Llandudno (13 properties – surface water) Llanfairfechan (12 properties – fluvial and surface water) and Conwy (8 properties – surface water). |
| 2005 | Dolwyddelan, Betwys Y Coed, Llanrwst and Trefriw. Coastline. | Fluvial Coastal Storm | Overtopping of the River Conwy in January caused flooding to 32 properties in the Conwy Valley. A coastal storm caused damage to a number of sea defences in February, most notably at Old Colwyn where major repairs were required. |
| 2006 | Colwyn Bay and Llandudno Junction. | Surface Water | Surface Water flooding due to lack of capacity in sewer and gully systems affected 5 properties. |
| 2009 | Llandudno, Conwy Valley, Trefriw, Betws y Coed, and Penmachno | Combined Causes (Surface Water, Fluvial) | Mainly caused by fluvial flooding following prolonged and heavy rain in the upper catchment of the Conwy River. Surface water flooding in Llandudno in the Conwy Valley occurred four days after due to a pump station failure. Approximately 50 properties were affected in total. |
| 2010 | Llanddulas, Llanfairfechan and | Coastal Storm | A coastal storm caused flooding to properties in Llanfairfechan and Llanddulas and damaged sea |

| | | | |
|------|--|--|--|
| | Colwyn Bay | | defences across the county. Major repairs were required at Llanfairfechan due to a breached sea wall and at Old Colwyn where the sea wall was undermined. |
| 2011 | Abergele, Llanddulas, Llanrwst, and Dolwyddelan | Combined Causes (Surface Water, Fluvial) | River and surface water flooding occurred due to a brief period of intense rainfall on highly saturated catchments. Approximately 20 properties were affected including 11 in Llanrwst. |
| 2012 | Colwyn Bay, Rhos on Sea, Llanddulas, Abergele, Llandudno Junction, Dwygyfylchi, Kinmel Bay | Combined Causes (Surface Water, Fluvial) | River and surface water flooding occurred across the county in July. The worst affected areas were Colwyn Bay where a blocked trash screen caused flooding to 19 properties, and Rhos on Sea where a main pumping station exceeded its capacity and Llanddulas where a combination of high river levels and lack of capacity in drainage systems caused flooding to 3 properties. Prolonged heavy rainfall caused flooding throughout the county, but mostly confined to the coastal towns, in September. Most flooding was due to surface water with some river flooding in Abergele and Colwyn Bay. 65 calls were received by Environment & Technical services but internal flooding of properties was prevented in the vast majority of cases. |

Table 4.1: Significant flood events in Conwy over the recent years

Conwy County is exposed to the combined potential risk from river, tidal and coastal flooding. Urban drainage and surface water problems have also contributed to the counties long history of flooding.

The administration area of CCBC covers an area of approximately 1,130 km². The county falls into two river basin districts, the Western Wales River Basin District which covers the majority of the county and drains over 85% of the borough and the Dee River Basin District which covers the remaining approximate 15% of the county which is located within the south eastern corner of the county.

CCBC is responsible for 56 km of coastline, 37 km of which is artificially protected; this comprises 1/5th of the artificially protected coastline in Wales, from Llanfairfechan in the west across to the River Clwyd in the east. CCBC serves a total resident population of 111,800, approximately 80% of whom are settled along the coastal strip in the larger towns of Abergele, Colwyn Bay (the second largest town in North Wales) and Llandudno. Away from the coastal strip, the area is predominantly rural, and includes a significant region of upland mountainous terrain scattered with small villages and a few larger settlements adjacent to rivers.

Most of the flooding occurring inland is from the River Conwy and its tributaries. The towns of Trefriw and Llanrwst are located on the banks of the River Conwy; flood risks here are from surface water run-off, sewer systems and also tidally influenced river flooding.

The eastern extremes of the town of Abergele are potentially influenced by the Ffynnon-y-Ddol watercourse and the tidal River Clwyd, Abergele is also at risk from the River Gele. Conwy, Llandudno Junction, Mochdre, Colwyn Bay and the Ganol Valley are mainly urban areas and are partially exposed to the coast and estuary of the River Conwy and the River Ganol. This is an area of significant importance due to its

road and rail networks. In this area there is also a risk of flooding from the River Wydden and the River Gyffin. Surface water and sewer flooding have also been an issue in Conwy.

A few examples of historical flooding have been given however more details on specific locations can be found in the PFRA and a link provided in Chapter 6.

4.3 Types of Flooding

Flooding can be caused from a wide variety of sources and interactions between those sources. The Flood and Water Management Act defines 'local flood risk' as being a flood risk from:

- Surface water runoff;
- Groundwater; and
- Ordinary water courses.

These sources are defined below. It should be noted that in many cases these sources can be interrelated and flooding can be caused by a combination of sources including those not considered local sources such as main rivers or the sea.

Although this strategy is directed at managing risk from flooding from local sources, this document takes into account the aims and objectives identified in the *National Strategy for Flood and Coastal Erosion Risk Management* in Wales, published by the Welsh Government in November 2011. As such, and for completeness, all types of flooding that may occur in the county and that are covered by both strategies (local and national) have been described in the following sections.

4.3.1 Surface Water Flooding (pluvial)

Surface water flooding or runoff is caused by water flowing overland following periods of prolonged or intense rainfall, leading to flows or ponding of water. Surface water flooding can happen anywhere with very little warning and can disappear with a similar speed. Areas which have been historically subject to this type of flooding are likely to experience a higher probability of repeat flood events in the future according to climate change projections.

Simplistically surface water flooding is caused by the inability of rainwater to be absorbed into the ground quicker than it falls as precipitation, causing a build up and flows across ground. Precipitation that has entered a watercourse, public sewer, or drainage system and overflows from there onto the surface is not within the definition of surface runoff.

Surface water flooding is complex in nature and can be exacerbated by a number of factors. These include; poor infiltration rates where water is unable to (or slow to) discharge to ground including areas of impervious natural materials (for example Clay soils, non-porous rocks) or man-made materials (hard-standing, roofs); poorly maintained structures (blocked or silted gullies and pipe work) or under designed local drainage capacity allowing for insufficient attenuation of surface water runoff following periods of heavy rainfall; and obstructions in watercourses leading to overtopping and flows over land.

Significant work has been undertaken by the LLFA team within CCBC to identify the risk and the probability of flooding from surface water under Section 10 of the FFR. As part of their responsibilities the LLFA

produced a PFRA in 2011 to identify the areas within the county that are at risk from flooding. Figure 4.1 on the following page provides the locations of historical Surface Water and Sewer Flooding in Conwy.

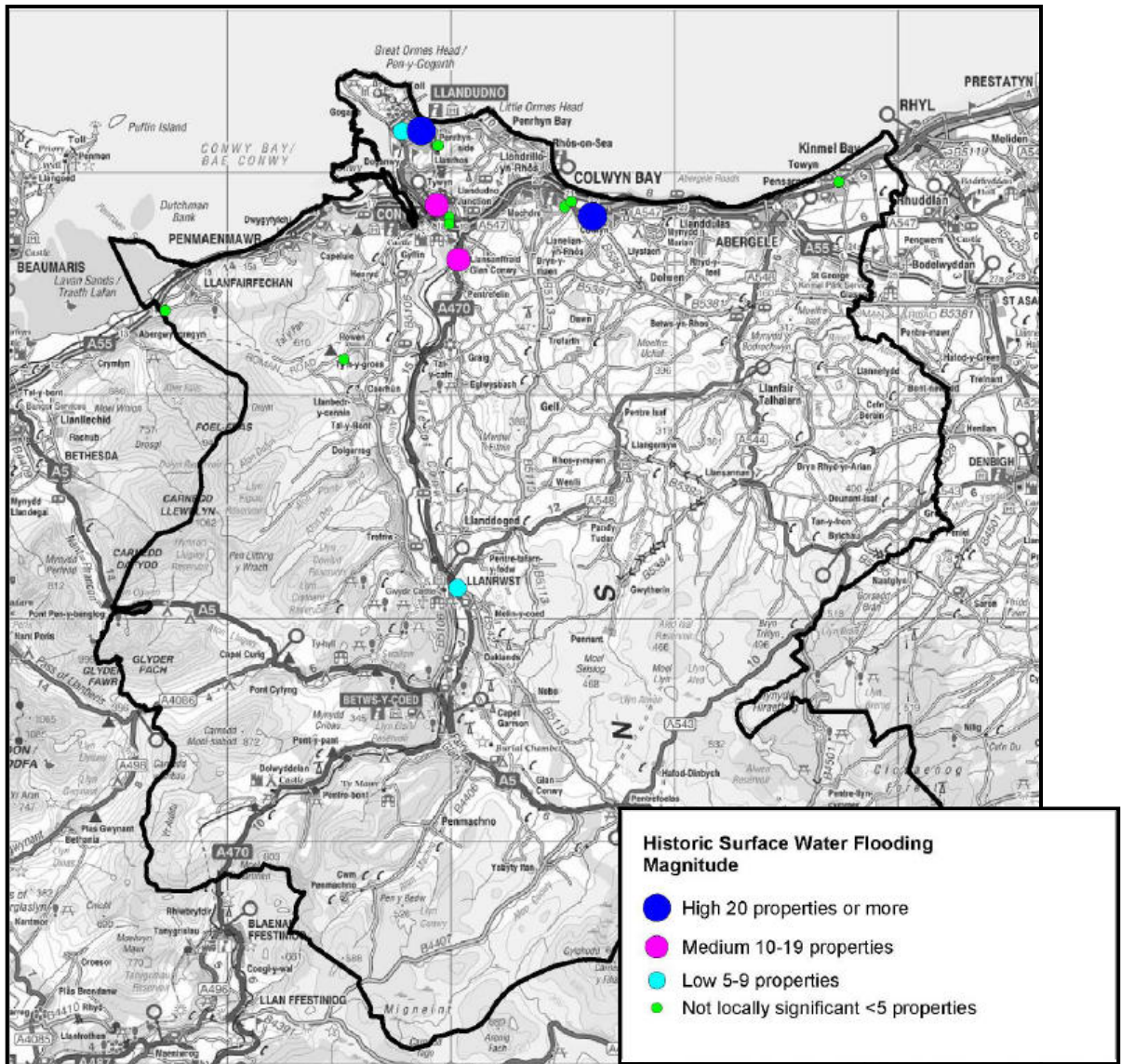


Figure 4.1: Risk of surface water/sewer flooding in Conwy based on historical events (No. properties at risk in 1 in 100 year event where FFS carried out) taken from the PFRA

As part of the PFRA the magnitude of historical surface water incidents (at a return period of 1 in 100 year event where a Flood Feasibility Study was conducted) were classified under four categories;

- High – where 20 properties or greater were flooded;
- Medium – where between 10 and 19 properties were flooded;
- Low – where between 5 and 9 were flooded; and

- Not locally significant – where less than 5 properties were flooded.

Based on the available records, two incidences for each of the high, medium and low magnitudes were recorded within the county, while eight areas were identified as not locally significant where less than five properties were impacted.

Flooding of this nature can occur in various locations throughout the county and includes Llandudno Junction and Conwy.

4.3.2 Groundwater Flooding

Groundwater is the term used to describe water that is stored underground in permeable rocks which are known as aquifers. The aquifers are fed through the process of precipitation which percolates through the ground and includes all of the water that is not lost to surface water runoff and evapo-transpiration. Groundwater forms the foundation of the base-flows of rivers and stream which are topped up by surface run-off. Groundwater flooding occurs when the water held underground rises above these levels. It is important to note that the term groundwater does not include any water that is carried in buried pipes or held underground in containers.

Predicting groundwater flooding is often complex as groundwater levels are heavily influenced by the underlying geology and the topography and geology of the surrounding catchment areas. Groundwater flooding can occur following extended periods of heavy rain (either local or within the aquifer catchment) and can occur many hours or even days after the precipitation has finished and can remain in-situ for long periods of time. Other factors that can influence groundwater levels can include reduced abstraction rates, or changes to underground flows.

In Conwy County flooding attributed directly to groundwater is extremely difficult to apportion as groundwater flooding usually occurs in combination with pluvial and fluvial flooding. As groundwater flooding occurs in low lying areas, basements of residential housing are usually impacted by this type of flooding.

Residents may not even be aware that their property has been flooded or they are aware that flooding has occurred previously (and do not store valuable goods in basements) and do not report incidents to the Council as limited damage to personal belongings has occurred. As such historical records relating to groundwater flooding within Conwy County are limited.

4.3.3 Fluvial Flooding

Fluvial flooding occurs when a river or ordinary watercourse reaches its capacity and overflows bursting its banks. This type of flooding can be influenced by a large number of factors, but usually occurs following prolonged and heavy rainfall within the rivers catchment area.

Under the Water Resources Act 1991, main rivers are defined on the main river map (see Figure 4.2 on the following page) and the Environment Agency Wales retains their powers relating to them. Fluvial flooding from main rivers is outside the scope of this strategy, as it only deals with flooding from ordinary watercourses. However, as the main rivers have an impact on ordinary watercourses the strategy does take the flooding issues from main rivers into account where appropriate.

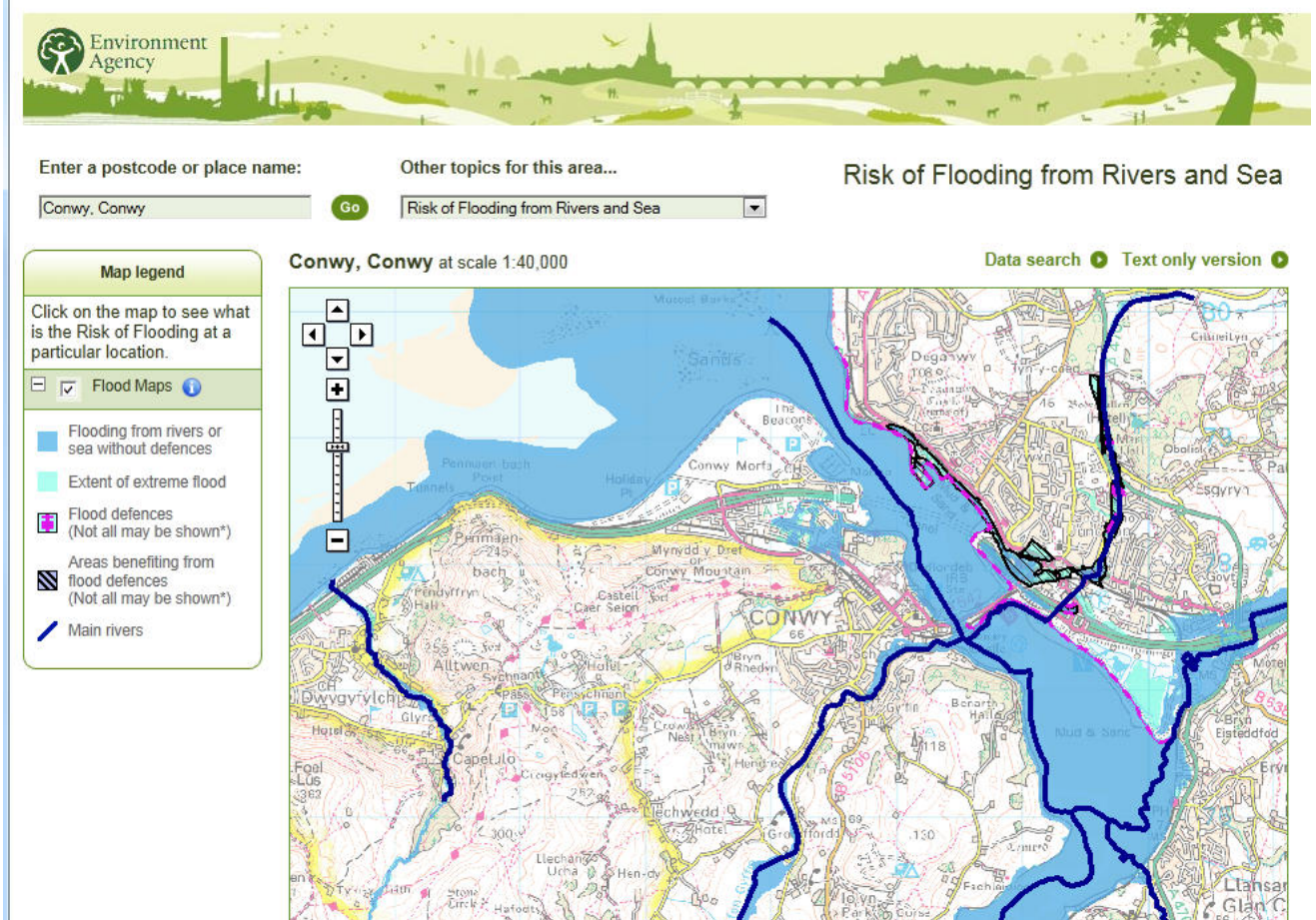


Figure 4.2: The Environment Agency Main River Map – Main rivers and risk of flooding from rivers and sea

Overseeing the management of local flood risk from ordinary watercourses that are not designated Main River, are the responsibility of Local Authorities or, where they exist, Internal Drainage Boards. In terms of ordinary watercourses the LLFA manages the risk from local flood under its responsibilities identified in the Land Drainage Act 1991⁸ and the FWMA. The roles and responsibilities of the partners, organisations and landowners that manage the different flood risks are detailed further in Section 7 of this report. The map showing the locations of fluvial flooding within the county is provided in Figure 4.3 on the following page.

⁸ Land Drainage Act 1991, schedule 2 paragraph 29

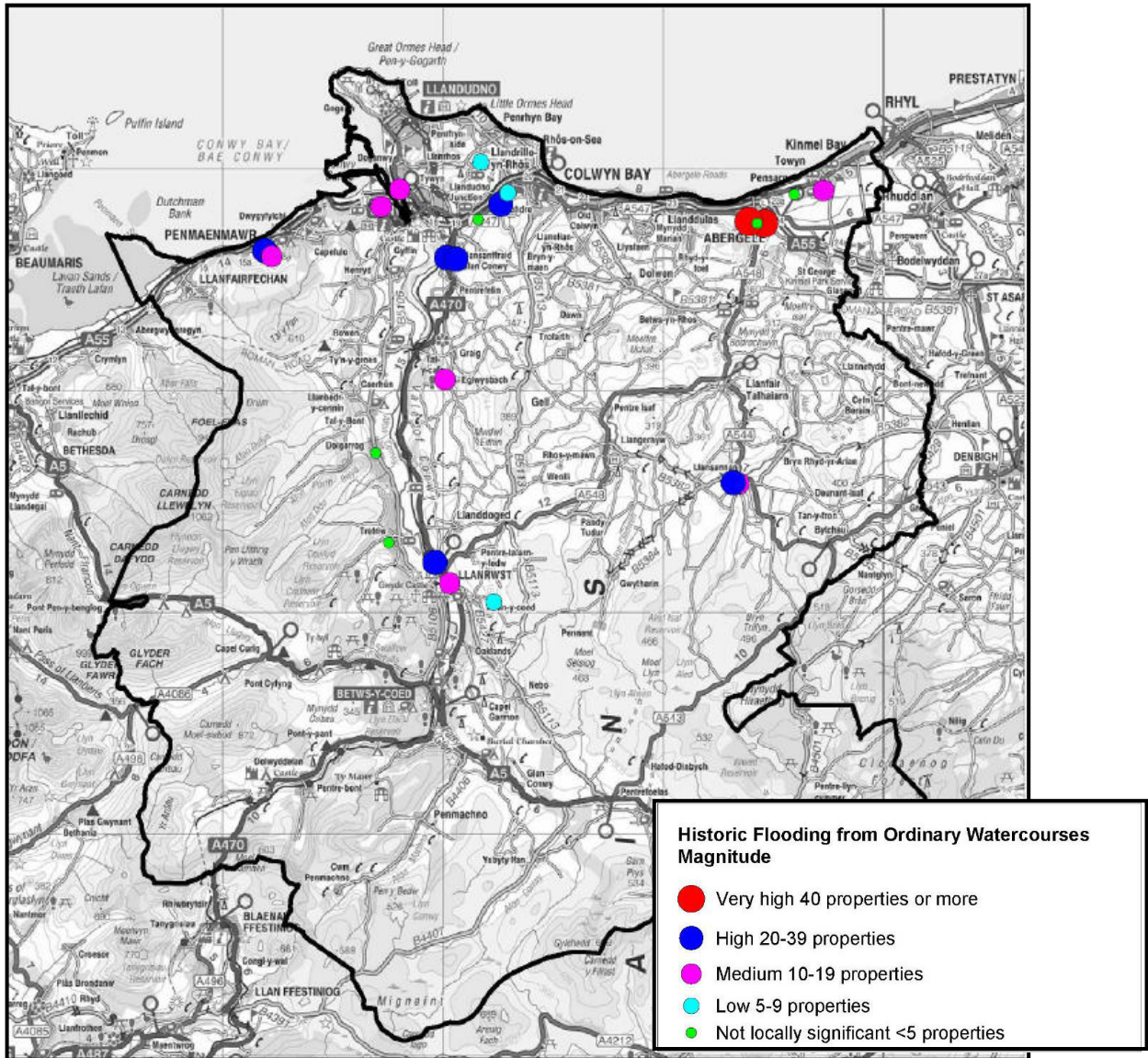


Figure 4.3: Risk of Ordinary Watercourse Flooding in Conwy based on historic events (No. properties at risk in 1:100 year event where FFS carried out)

The PFRA used the following categories of classification of magnitude of flooding from ordinary watercourses:

- Very High – where 40 properties or greater were flooded;
- High – where between 20 and 39 properties were flooded;
- Medium – where between 10 and 19 properties were flooded;

- Low – where between 5 and 9 were flooded; and
- Not locally significant – where less than 5 properties were flooded.

The historical records identified two incidences of historical flooding where greater than 40 properties were flooded; six records were classified as high magnitude; seven of medium magnitude; three of low; and five as not locally significant.

There have been notable risks in Conwy from main rivers at Trefriw and Llanrwst although this risk has been reduced by works undertaken by EAW. There are also flood risks from smaller watercourses and tributaries at Mochdre, Abergele, Llanfair Talhaiarn, Llanrwst and Trefriw.

4.3.4 Sewer or Highway Flooding

Sewer or Highway flooding is caused when flows or volumes of surface water exceed the capacity of drainage infrastructure or where a blockage occurs. This type of flooding generally occurs following periods of intense rainfall leading to the drainage systems being overwhelmed. This type of flooding can be exacerbated in autumn when drainage gullies become blocked with leaves or other detritus.

Within CCBC, Dŵr Cymru Welsh Water (DCWW) is the water company with the responsibility for managing and maintaining drainage systems (surface water and combined sewers). DCWW are required to record and report on property flooding within their management areas, as part of their service indicators known as Director General (DG) Registers. The register which records the flooding incidents within the county are known as DG5, which are provided to the Water Services Regulatory Authority, or Ofwat.

4.3.5 Reservoir Flooding

Flooding attributed to reservoirs occurs when a reservoir dam is overtopped or fails due to damage or collapse of the structure. The Pitt Review undertaken as a result of the floods in 2007 recommended that the Government should provide flood maps to identify areas that could be affected by a breach or overtopping to allow plans to be prepared for an emergency response. In 2008 the Department for Environment, Food and Rural Affairs (Defra) instructed the Environment Agency to assess the impact of dam breach flooding from all large raised reservoirs in England and Wales which were registered under the Reservoirs Act 1975.

The Reservoir Act classifies a registered reservoir as one that is capable of holding at least 25,000 cubic metres of water above the lowest natural ground level above the natural level of the surrounding land. More recently The Flood and Water Act 2010 classifies a raised structure or area that is “large” if it is capable of holding 10,000 cubic metres of water above the natural level of any part of the surrounding land.

Within Conwy County there are 17 reservoirs that fall under the Reservoir Act and the maximum extent of flooding has been modelled by the EAW to show the areas that would be impacted by a breach or failure of the dams. Out of these reservoirs there are 12 that have been designated as at ‘High Risk’ by the EAW.

There is one historical record of a dam failure within the County which involved the failure of two dams causing a flood that swamped the village of Dolgarrog, killing 16 people in 1925. The disaster led to the formation of the Reservoirs (Safety Provisions) Act in 1930, which has since been updated to the Reservoirs Act 1975.

4.3.6 Coastal Flooding

Sea flooding occurs when water levels or waves overtop the crest of the coastal defences, or when defences are breached or collapse. The probability of breach is dependent on four main factors: weather conditions (generating large waves); wind direction (on-shore); high tides (particularly during spring tides) and the condition of the coastal defences. When these conditions combine the risk of flooding can be greatly enhanced as the predicted tide level can be raised by several metres. This phenomenon is known as a storm surge and the most well known incidence within the County occurred in February 1990 where a combination of gale-force wind, a high tide and rough seas caused Towyn's flood defences to be breached.

The sea defences were breached over a 400 m section at Towyn with a storm surge of 1.5 m above the predicted high tide. The breach caused 10 km² of land in Towyn and Kinmel Bay to be flooded affecting nearly 2,800 properties, and leaving nearly 6,000 people temporarily displaced causing the resort to be evacuated.

As a result of the breach British Rail spent £10 Million strengthening the coastal defences in the area stacking rock on the seaward side of the sea wall to form revetments.

As a result of the breach a House of Commons committee held an enquiry into the flood. The incident was important as it alerted authorities around Britain to the importance of ensuring that coastal defences are adequate for a future of increasing sea levels and extreme weather events, which are likely to be increasingly common.

There is risk of tidally influenced flooding along the whole of Conwy frontage especially in the urban areas, the main areas of concern are; Llanddulas, Llanfairfechan, Kinmel Bay, Llandudno, Old Colwyn (rail embankment) and the town of Conwy.

4.4 A Combination Event

Detailing individual sources of risk does not imply that flooding can only ever occur for one reason. Any and all of these sources mentioned above can come together to produce what are called combination events.

An example of a combination flood is one occurring during a period of intense or prolonged rainfall. The rain would increase water levels in watercourses, saturate ground, increase flow through the drainage system and could enter the public sewerage system, increasing pressure. As all of these factors combine, watercourses, drains and sewers could all reach maximum capacity and with nowhere else to go the water could overflow from all of them, resulting in a combination of river, sewer and surface water flooding.

On the coast, a combination event could involve flooding from the sea where a storm delivers intense rainfall on the land and a storm surge and stormy seas, at the same time as a high tide. This results in an increase in tide and wave levels at the same time as flow from rivers to the sea increases. If the two meet, coastal communities could experience a mix of flooding from the sea and a river.

Depending on the intensity of the rainfall and the waves, such an event could also cause an increase in coastal erosion, resulting in long term damage to the coast, which could exacerbate future flood risks.

Where there are complicated interactions of different sources, the LLFA will take a lead to ensure that investigation, assessment and appropriate mitigation measures are carried out⁹.

4.5 Coastal Squeeze

A Defra (2003) guidance note on managed realignment defined coastal squeeze as; the process by which coastal habitats and natural features are progressively lost or drowned, caught between coastal defences and rising sea levels¹⁰.

As sea levels rise, increasing wave height and intensity, sea waters move further inland with the consequential loss of low lying habitats and damage to the features of the habitat and associated species within it. This loss of intertidal habitat is referred to as coastal squeeze, and while generally referred to in relation to habitat, it can also have an impact on flood and coastal erosion risk.

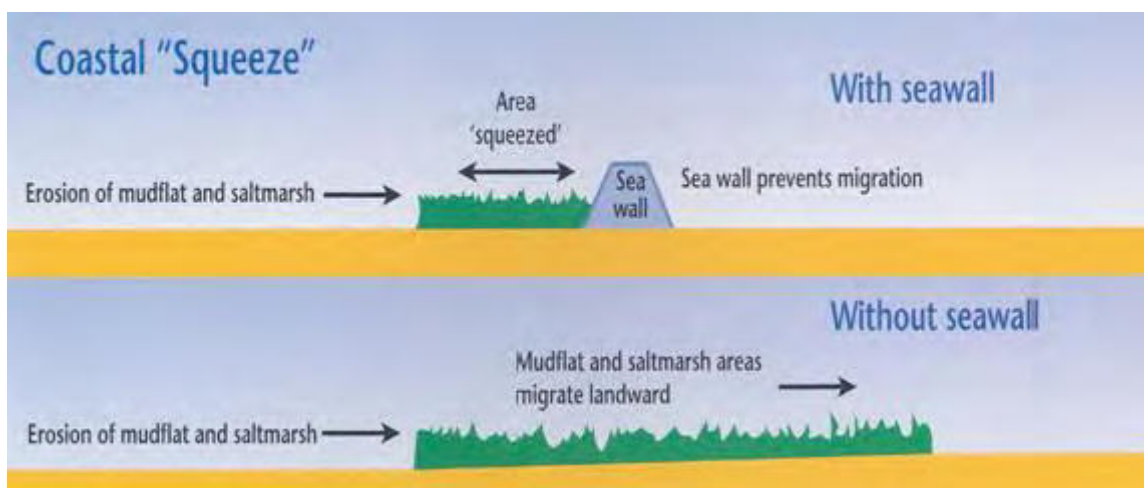


Figure 4.4: Coastal Squeeze (The National Strategy for Flood and Coastal Erosion Risk Management)

Decreasing the extent of foreshore in front of a defence, for example, can create deeper water with a consequent increase in wave size. This can undermine defences or make it more likely that defences are overtopped.

It is important to note the role that coastal features like beaches and sand dunes can play in wider coastal protection. They can be significant natural buffers to sea flooding if considered as part of an integrated management strategy using natural processes and through this potentially reduce the maintenance costs or increase the lifespan of structures protected by them.

They also provide important ecological benefits such as fish nurseries, as well as recreational and tourism opportunities for local communities. These habitats can provide multiple benefits to society, the economy, and the environment¹¹.

⁹ Chapters 4.4 and 4.5; National Strategy for Flood and Coastal Erosion Risk Management in Wales

¹⁰ Defra (2003) Guidance Note on Managed Realignment: Land Purchase, Compensation and Payment for Alternative Beneficial Land Use. Defra, London, UK.

Under Section 40 of the Natural Environment and Rural Communities Act 2006 (NERC), Local Authorities must have regard to the conservation of biodiversity, which includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.

4.6 Factors Increasing Flood Risk

Flood risk is a combination of probability and consequence, as there are a number of factors which will lead to higher probability of flooding in the future and more serious potential consequences, this will result in an increase in the risk of flooding in Conwy. There are many factors that can increase flood risk; some are included in table 4.2 below:

| Factors which may increase flood risk in Conwy | | |
|---|---|--|
| Weather | Hydrological | Human |
| <ul style="list-style-type: none"> ■ Rainfall; ■ Extensive storms; ■ Small-scale storms; ■ Temperature; and ■ Snowfall and snowmelt. | <ul style="list-style-type: none"> ■ Soil moisture level; ■ Groundwater level prior to storm; ■ Natural surface infiltration rate; ■ Presence of impervious surfaces; ■ Channel cross-sectional shape and roughness; ■ Presence or absence of over bank flow; and ■ Synchronization of run-offs from various parts of the catchment. | <ul style="list-style-type: none"> ■ New development and changes in land use (e.g. hard standing surfaces due to urbanization) increase run-off; ■ Building within the flood plain; ■ Obstructions to flows within flood plain areas; ■ Lack of maintenance on open watercourses and small culverts; ■ Deterioration in the condition and performance of existing drainage infrastructure; ■ Climate change - more frequent and more severe extreme weather; ■ Diversion of watercourses; and ■ Illegal connections to sewers. |

Table 4.2: Factors which may increase flood risk in Conwy County

4.7 Methodology for Identifying Areas of Risk

As part of the Council's responsibilities as the LLFA under the FRR 2009, CCBC produced a Preliminary Flood Risk Assessment (PFRA) in 2011. The purpose of this report was to identify areas within the county that were at risk of flooding with significant consequences which were termed as 'Flood Risk Areas'.

¹¹ Chapter 4.5; National Strategy for flood and coastal erosion risk management in Wales

Significant consequences were defined by the Welsh Government (WG) and the Department for Environment, Food and Rural Affairs (Defra) within the guidance document '*Selecting and Reviewing Flood Risk Areas for local sources of flooding – Guidance for Lead Local Flood Authorities*' as:

'Clusters of areas above flood risk threshold with an affected population greater than 5,000 people at risk'

Under this guidance, three clusters were identified by EAW within CCBC located within Llanrwst, Colwyn Bay and Abergele. However, all of the affected clusters fell beneath the population threshold of 5,000, and as such fell outside the regulations and were not considered to be Flood Risk Areas.

As the population densities were unlikely to trigger the regulations for the majority of North Wales the LLFA's for each county derived new local thresholds to identify flood risk areas within their boundaries. A locally significant event was defined as:

- Where 5 or more properties have been flooded; and
- When fewer than 5 properties have been flooded, the outcome of a Flood Feasibility Study (FFS) has identified a risk to at least 5 properties.

On this basis the LLFA undertook the preliminary study to provide an assessment of the flood risks using historical records held by the county overlain with flood modelling data provided by EAW, to identify the local Flood Risk Area's within the County. The report determined that within the bounds of the county a total of 24 locations were identified that exceeded the thresholds and had been subject to historical flooding incidents.

4.8 Limitations of data

The assessment of flood risk to date within Conwy County has been completed using the best information that is currently available. However, there are inherent limitations with this information and it is important that these are identified (See Table 4.3 on the following page). The main data limitations were the consistency and reliability of the collection of past flooding information. CCBC has no information currently available relating to predicted future flood risk other than that provided by the EAW. It is the intention to carry out electronic modelling for significant areas of flood risk within the Local Strategy area, as part of the preparation of Flood Hazard and Flood Risk Maps and the Flood Risk Management Plan.

| Dataset | Main limitations | Future improvement |
|---|---|--|
| Flood Map for Surface Water | Modelling used a national methodology with a standard set of assumptions (such as storm duration, etc) which may not be suitable for the whole of Conwy. | Detailed surface water modelling within locally important flood risk areas will provide a better understanding of flood risk, mechanisms and consequences. |
| Areas Susceptible to Groundwater Flooding | This is a very high level dataset describing the proportion of each grid square that may be susceptible to groundwater flooding. It does not show the likelihood of groundwater flooding occurring. | Obtain the complete British Geological Survey (BGS) dataset for key areas, which provides a more accurate overview of areas where geological conditions suggest groundwater might emerge. |
| Flood History across Conwy | Flood history collected through the PFRA is generally poor and inconsistent. It is difficult to make a fair and accurate assessment of flood risk across Conwy based on this alone. | More comprehensive flood recording and flood investigation in the future is essential (this is currently underway, as a requirement of the FWMA and will provide a better level of flood history in the future). |

Table 4.3: Limitations of main datasets used to prioritise locally important flood risk areas

5. Climate Change

‘Communities living behind good coastal defences currently protecting them against a flood with a chance occurrence of 1 in 100 each year would experience a drop in standard of protection by the end of the century to as low as 1 in 5 each year if we were to follow a business-as-usual flood management policy.’

*Future flooding in Wales: Flood defence. Possible long-term investment scenarios
Environment Agency Wales*

5.1 Climate Change

Climate change is one of the most serious threats facing the world's economy and society. The devastating floods, droughts and storms that we have seen in the UK and across the world in recent years show all too clearly how vulnerable we are to climate extremes and how devastating the consequences can be.

There are no easy solutions and to achieve a long term response to climate change a fundamental shift is required in the way we conduct our lives, generate and use energy over the coming century. In the UK the government is committed to implementing a programme to reduce our emissions through legislation, education, substantial investment in clean technologies and green electricity generation.

Significant scientific research has been conducted on climate change by United Kingdom Climate Projections (UKCP09), which is funded by the Department for Environment, Food and Rural Affairs (Defra) on behalf of the UK Government and the Devolved Authorities. The research is based on sound science and projections provided by the Meteorological Office (Met Office), which is focused on the UK. The aim of the research and projections are to assist those needing to plan how they will need to adapt to a changing climate.

To assess the potential impacts that climate change may have on extreme rainfall, river flood flows, sea level rise and storm surges, UKCP09 have provided a large toolkit of information and data including ‘change factors’ which have been developed to help Risk Management Authorities use the UKCP09 information in a timely and cost-effective way and to provide a consistent approach. The change factors quantify the potential change (as either mm or percentage increase, depending on the variable) to the baseline.

Guidance has been provided on Climate Change from WG; *Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales, December 2011*. It is recommended here that options are developed, planning for the change factor covering the whole of the decision lifetime. Change factors for river flood flows, extreme rainfall, mean relative sea level rise and storm surges are provided in the guidance and are to assist in investment planning decisions.

Short term flood risk management decisions and actions should be set within a longer term strategic planning framework. In Wales there are plans in place to address the increasing flood risk and to guide adaptation to climate change. The strategic plans are:

- Catchment Flood Management Plans¹² – produced by Environment Agency Wales.
- Shoreline Management Plans¹³ – Produced by Coastal Groups, composed of maritime Local Authorities, Environment Agency Wales, Countryside Council for Wales and others.

¹² CFMPs are high level non statutory plans for inland flood risk produced by Environment Agency Wales

Catchment Flood Management Plans consider inland flood risk now and in the future, up to 100 years ahead, and assess the potential impacts of climate change and land use change on future flood risk. Similarly, Shoreline Management Plans assess the threat to the coast from erosion and flooding. These plans look at the current and future scenarios over a 100-year timeframe. Both Catchment Flood Management Plans and Shoreline Management Plans are subject to periodic review as new information becomes available. The policies and actions set out in the plans may change with time to reflect adaptation to increasing risks and climate change¹⁴.

5.2 Climate Change in Wales

A climate change risk assessment for Wales was produced by Defra in January 2012 as part of the UK Climate Change Risk Assessment (CCRA), under the Climate Change Act 2008. The assessment reviewed all of the relevant and available data drawing on sector reports and recent research literature, to provide projections for climate change for the 2020s, 2050s and the 2080s compared with recorded weather data from 1961 to 1990. The document reviewed Low, Medium, and High Emissions scenarios for each of the time periods and produced predictions for changes and perceived impacts on variations in temperature and weather conditions.

The report states that there will be an increase in flooding events on the coast and inland, affecting people, property and infrastructure. It is predicted that flooding will increase from a combination of different sources which will cause increase in disruption to communities, the economy and employment. Flooding would also affect water supplies, waste water disposal, energy supplies and health services for areas not directly impacted by the flooding.

The key findings for Wales from the 2050's Medium Emissions scenario are:

- An increase in mean winter temperatures of 2.0 °C (very unlikely to be less than 1.1 °C and very unlikely to be more than 3.1 °C);
- An increase in mean summer temperatures of 2.5 °C (very unlikely to be less than 1.2 °C and very unlikely to be more than 4.1 °C);
- An increase in mean winter precipitation of 14% (very unlikely to be less than 2% and very unlikely to be more than 30%);
- A decrease in mean summer precipitation of 17% (very unlikely to be less than a 36% decrease and very unlikely to be more than a 6% increase); and
- Sea level rise is projected to increase by between 0.10 m and 0.32 m by the 2050's.

The Welsh Government is working with the Environment Agency Wales to develop updated guidance on what we should plan for in relation to climate change when undertaking flood or coastal erosion risk management works.

¹³ SMPs are high level non statutory plans for coastal erosion and flooding produced by Coastal Groups

¹⁴ Future flooding in Wales: flood defences. Possible long-term investment scenarios

6. Regional and Local Plans

There are a variety of publically available documents which identify flood risk within Conwy. These include:

- Conwy County Borough Council Preliminary Flood Risk Assessment;
- Conwy and Clwyd Catchment Flood Management Plan;
- River Dee Catchment Flood Management Plan;
- North West Wales Catchment Flood Management Plan;
- West of Wales Shoreline Management Plan 2;
- North West England and North Wales Shoreline Management Plan SMP2;
- River Basin Management Plan – Western Wales River Basin District and Dee River Basin District;
- Conwy Tidal Flood Risk Assessment;
- Conwy Strategic Flood Risk Assessment;
- Multi Agency Flood Plans; and
- The Tidal Clwyd Flood Risk Management Strategy.

A brief review of each document is provided in the following sections:

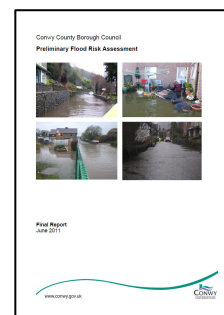
6.1 Conwy County Borough Council Preliminary Flood Risk Assessment

The Conwy County Borough Council Preliminary Flood Risk Assessment (PFRA) was published in December 2011 (as per the Flood Risk Regulations 2009). The PFRA is aimed at providing a high level overview of flood risk from local sources, including surface water, groundwater and ordinary watercourses. It combines modelling of rainfall events carried out by the Environment Agency with historical locally collected information to identify the local flood risk across the county.

The Environment Agency Wales has used a national methodology, which has been set out by Welsh Government, to identify Indicative Flood Risk Areas across Wales. Conwy does not have any Indicative Flood Risk Areas within its boundary and therefore Conwy County Borough Council are not required to carry out further action under the Flood Risk Regulations until the next review of the PFRA in 2017.

The full report can be found here:

<http://publications.environment-agency.gov.uk/PDF/FLHO1111BVEY-E-E.pdf>



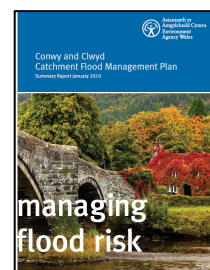
6.2 Conwy and Clwyd Catchment Flood Management Plan

The Conwy and Clwyd Catchment Flood Management Plan looks at fluvial flood risk and covers an area of approximately 1,500 km² which includes the majority of Conwy other than the western and south eastern boundaries of the county. The main sources of flood risk are derived to be from the River Conwy and tidal flood risk from the estuary of the River Clwyd. There is also flood risk from smaller watercourses and tributaries of these main rivers. Some surface water flooding is also identified but is based on limited evidence.

The highest risk identified is that of tidal flooding to Kinmel Bay in combination with flows from the River Clwyd. River flooding affects far fewer properties, but is classified as a significant local risk in Llanrwst, Mochdre, Trefriw and other isolated properties in the Conwy Valley, Abergele, Conwy, Dolwyddelan, Kinmel Bay, Llandudno Junction and Llanfairfechan. Climate change is projected to substantially increase flood risk to Abergele (from both river and tidal sources), Conwy, Kinmel Bay (proportionally more from river sources than tidal) and Llandudno Junction. The report recommends further action to be taken to reduce flood risk in Kinmel Bay.

The full summary report can be found here:

<http://publications.environment-agency.gov.uk/PDF/GEWA0110BRKU-E-E.pdf>



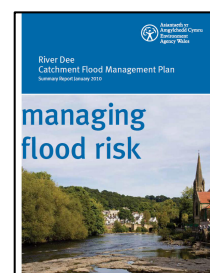
6.3 River Dee Catchment Flood Management Plan

The River Dee Catchment Flood Management Plan looks at fluvial flood risk. The River Dee is 110 km long and its catchment includes mainly agricultural areas in the southeast of Conwy. The main source of flood risk is from the River Dee and the tributaries which are located within the bounds of Conwy County are not identified as being a source of significant risk to properties. There is also flood risk from smaller watercourses and tributaries of these main rivers.

No significant flood risk areas are identified within Conwy County and existing flood risk management is considered suitable for the Upper Dee region which covers the county.

The full summary report can be found here:

<http://publications.environment-agency.gov.uk/PDF/GEWA0110BRKO-E-E.pdf>



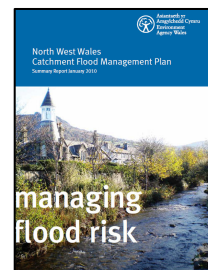
6.4 North West Wales Catchment Flood Management Plan

The North West Wales Catchment Flood Management Plan looks at fluvial risk and covers an area of approximately 3,400 km², however, only the western boundary of Conwy is included in this area. The main source of flood risk within Conwy County is the River Ddu from which there are both river and tidal risks.

The report identifies Llanfairfechan to be at significant flood risk and climate change is projected to more than double the number of properties at risk. The report recommends further action to be taken to reduce flood risk in Llanfairfechan.

The full summary report can be found here:

<http://publications.environment-agency.gov.uk/PDF/GEWA0110BRKF-E-E.pdf>



6.5 West of Wales Shoreline Management Plan 2

The West of Wales Shoreline Management Plan 2 (SMP2) covers the coastline from St Ann's Head in Pembrokeshire to the Great Orme in Llandudno, Conwy. It also covers the major estuaries within this area including the River Conwy. It is one of the largest SMP covering over 1,000 km of shoreline, however, most of the coastline relating to Conwy within this SMP is covered by a single Policy Development Zone (PDZ).

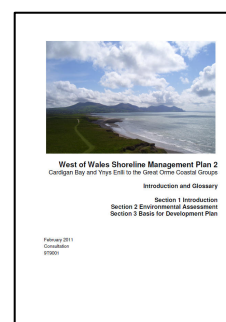
The SMP provides high level policies for management of the coast in relation to flood risk, coastal erosion, natural environment, historic environment and the economy. It also looks at how management should change over the next 100 years in order to achieve sustainable management of the coast.

Much of the shoreline is made up of natural rock headlands, which are given a No Active Intervention policy (Policy decision to not to invest in providing or maintaining defences or natural coastline), and the bays between the headlands usually containing sea defences to protect the residential hinterland, which are mostly given a Hold The Line policy (Policy decision to maintain or upgrade the level of protection provided by defences or natural coastline).

The policy of Hold The Line may not be sustainable for some frontages and the Managed Realignment policy has been widely adopted at the mouth of the River Conwy in order to promote a consistent strategy being produced to work with natural processes to provide a more natural and sustainable defence at the west shore of Llandudno and at Deganwy.

The full SMP and appendices can be found here:

http://www.westofwalessmp.org/content.asp?nav=23&parent_directory_id=10



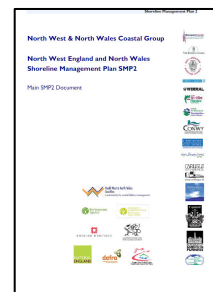
6.6 North West England and North Wales Shoreline Management Plan SMP2

The North West England and North Wales Shoreline Management Plan SMP2 covers the coastline from the Great Orme in Llandudno, to the Scottish Border on the Solway Firth. It also covers the major estuaries within this area including the River Clwyd. Sub-Cell 11a – Great Orme’s Head to Southport contains all of the Conwy Shoreline that is covered within this SMP.

The SMP provides high level policies for management of the coast in relation to flood risk, coastal erosion, natural environment, historic environment and the economy. It also looks at how management should change over the next 100 years in order to achieve sustainable management of the coast.

Most of this shoreline has sea defences protecting the highly populated hinterland. Key transport infrastructure such as the North Wales railway line and the A55 Trunk Roads are also present, next to the shoreline in many areas. These factors make Managed Realignment an impractical policy (with the exception of sections of the Clwyd Estuary on the west bank at Kinnel Bay in the long term) and a Hold the Line policy is used throughout Conwy except at the rock headlands of the Great Orme, Little Orme and Tan Penmaen Head where a No Active Intervention policy is retained.

The full SMP and appendices can be found here: <http://www.mycoastline.org>



6.7 River Basin Management Plan – Western Wales River Basin District and Dee River Basin District

The River Basin Management Plans for the Western Wales River Basin District and the Dee River Basin District are plans to achieve Water Framework Directive requirements to improve the water quality of surface water bodies.

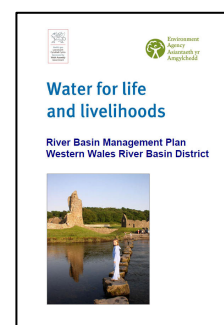
While these plans do not identify flood risk or consider management of flood risk, they must be taken into account when carrying out any flood risk management works. Works must not cause the deterioration of water quality in any surface water body or prevent improvement targets from being met. The plan also encourage sustainable drainage systems (SuDS) to be used in new development to remove contaminants from surface water as well as reducing flood risk.

The Western Wales River Basin Management Plan report can be found here:

<http://publications.environment-agency.gov.uk/PDF/GEWA0910BSWP-E-E.pdf>

The Dee River Basin Management Plan report can be found here:

<http://www.environment-agency.gov.uk/research/planning/124748.aspx>



6.8 Conwy Tidal Flood Risk Assessment

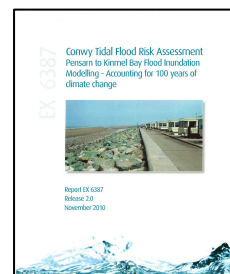
The Conwy Tidal Flood Risk Assessment (CTFRA) was carried out by CCBC in collaboration with the EAW to provide a more in-depth scientific study of coastal flood risk in areas that were indicated as being at high risk by the national scale flood maps from the EA.

The first phase of the study identified high priority sea defences where there is a risk of overtopping or breach. The next phase involved detailed modelling of coastal flood risk in Llandudno and Towyn / Kinmel Bay. The 1990 floods in Towyn were used to calibrate the models.

Following the production of present day flood risk maps, 50 years of climate change was then considered and maps published for Llandudno. Consultation with EAW led to the updating of the Towyn / Kinmel Bay maps and 100 years of climate change was considered for the area in line with the EAW approach to assessing flood risk to proposed new developments.

Full details of the study can be found here:

<http://conwyfloodmap.hrwallingford.co.uk/>



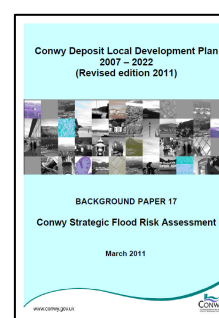
6.9 Conwy Strategic Flood Risk Assessment

The Conwy Strategic Flood Risk Assessment (SFRA) was produced as a background paper for the Deposit Local Development Plan (LDP). The aim of the SFRA is to apply the sequential test to candidate developments sites in order to direct future development away from high flood risk areas.

The flood risk for all potential development sites was assessed using EA flood maps and CTFRA. Sites with high flood risk were rejected and those with partial areas of risk were considered within the flood free area.

The full report can be found here:

http://www.conwy.gov.uk/upload/public/attachments/448/BP17_Conwy_Strategic_Flood_Risk_Assessment.pdf



6.10 Multi Agency Flood Plans

The North Wales Local Resilience Forum (LRF) has identified flood risk as a very high risk in the North Wales Community Risk Register. The LRF has produced a Multi Agency Flood Plan for responding to flood emergencies within North Wales.

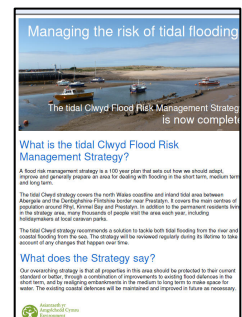
Within Conwy, the Civil Contingencies Unit has produced Multi Agency Plans in consultation with other Category 1 Responders (Police, Fire, Ambulance, Health, Environment Agency, Coastguard, Local Authorities etc) for specific flood risks in the county. The plans currently in place include the Corporate Flood Plan which gives the general response to any flooding within the county and the Conwy Valley Flood Plan which provides more localised details for flood response in Llanrwst and Trefriw. Further plans for Morfa Rhuddlan (Towyn / Kinnel Bay area) and Llandudno are being produced.

6.11 The Tidal Clwyd Flood Risk Management Strategy

The Tidal Clwyd Flood Risk Management Strategy was produced by the Environment Agency to recommend a plan for flood risk management of the Kinnel Bay area (both from the River Clwyd and the coast) over the next 100 years.

A summary report can be found here:

[http://www.environment-agency.gov.uk/static/images/Leisure/20111205_Clwyd_factsheet_\(online_version\).pdf](http://www.environment-agency.gov.uk/static/images/Leisure/20111205_Clwyd_factsheet_(online_version).pdf)



7. Managing the Likelihood of Flooding

The Pitt Review identified inadequate and unclear responsibilities across the organisations that undertake a flood management role and it was seen as a significant factor in the poor response to historic flooding. The Pitt Review recommended¹⁵ that future legislation (the Flood Water Management Act 2010¹⁶) addresses all sources of flooding, clarifies responsibilities and facilitates flood risk management. The FWMA subsequently defined certain organisations as 'Risk Management Authorities' in Wales whom have roles and responsibilities around flooding. The Risk Management Authorities in Conwy are:



Environment Agency Wales is responsible for managing flood risk from **main rivers** and the **sea**, and also has a strategic overview role over all flood and coastal erosion risk management and for regulating the safety of reservoirs. EAW also has a key role in providing flood warnings to the public.



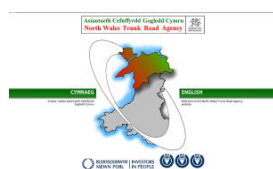
Conwy County Borough Council as a lead local flood authority, is responsible for taking the lead in managing flood risk from all local sources, including **surface water**, **groundwater** and **ordinary watercourses**.



Dŵr Cymru Welsh Water (DCWW) is the regional water and sewage treatment company serving the Conwy area. DCWW is responsible for flood risk from **sewers** and **burst pipes**.



Conwy County Borough Council as an Environment, Roads and Facilities Service Department is responsible for managing flood risk on roads and **highways** within the area. Local Authorities in Wales act as highway authorities in respect of local roads.



North and Mid-Wales Trunk Road Agent (NMWTRA) is responsible for the maintenance and improvement of **trunk roads** across Conwy on behalf of the Welsh Government. NWTRA must ensure that:

- Road projects do not increase flood risk;
- Road discharges do not pollute receiving waterbodies¹⁷.

Contact details for each of these Risk Management Authorities can be found in Appendix A.

¹⁵ The Pitt Review, Section 3, Chapter 8, Recommendation 28

¹⁶ Section 6(15) of the Flood and Water Management Act 2010: <http://www.legislation.gov.uk/ukpga/2010/29/contents>

¹⁷ <http://www.highways.gov.uk/knowledge/18542.aspx>

All of the risk management authorities identified above have the following new responsibilities under the Act:

- **A duty** to co-operate with other risk management authorities within the function of their flood and coastal erosion risk management role, which includes sharing flood data and information; and
- **Authority to take on** flood and coastal erosion functions from another risk management authority when agreed by both sides.

Co-operation with other risk management authorities includes the following:

- Discussing with other risk management authorities before designating structures;
- Report local flooding incidents to the CCBC Flood Investigation Officer on a monthly basis;
- Report flood assets, as defined by agreed criteria, as and when they are made known;
- Assist with Flood Investigation Reports when required;
- Provide local knowledge on SuDS regarding applications in their area;
- Ensure that members of the public are guided to the appropriate authority or organisation; and
- Share expertise, data, information and local knowledge and work jointly to understand and reduce flood risk across Conwy.

Each risk management authority also has specific responsibilities under the FWMA; which are described in the next section.

However flood risk management is not something that can be left solely in the hands of certain organisations and forgotten by everyone else. **Households, businesses and landowners** have their part to play too. Even if this strategy was being devised at a time of substantial public sector budget cuts, the organisations would still not be able to prevent all floods or solve all concerns. That is why the powers and responsibilities of Conwy's citizens are also recorded in this section.

7.1 Responsibilities of Environment Agency Wales



The Environment Agency Wales (EAW) has always led on the management of the risks of flooding from main rivers and the sea. However, in recognition of the links between coastal flooding and coastal erosion, particularly in terms of consequences, and as an outcome of the FWMA the EAW has new operational responsibilities in relation to coastal erosion as well as operational responsibilities for flooding from rivers and the sea. The EAW also has a wider oversight role for all flood and coastal erosion risk management in Wales.

As part of their oversight role the EAW will lead on the provision of technical advice and support to the other Risk Management Authorities. They will also lead on national initiatives such as Flood Awareness Wales, the national raising awareness programme, and the single point of contact for enquiries and information on flood risk, currently being piloted via their Floodline Warning Service.

The Flood and Water Management Act 2010 places a number of statutory duties on the Environment Agency Wales including:

- Reporting to the Minister on flood and coastal erosion risk in Wales including the application of the National Strategy; and
- The establishment of Regional Flood and Coastal Committees.

The Environment Agency Wales will be the sole Risk Management Authority charged with monitoring and reporting on the National Strategy's implementation. In undertaking this role they will:

- Collect data on progress from Risk Management Authorities using existing avenues wherever possible;
- Report factual information to Welsh Government; and
- As requested, provide interpretive advice to the Welsh Government.

It will be for the Welsh Government to determine what, if any, action should be taken if the reports from the Environment Agency Wales suggest the National Strategy is not being implemented or that actions being taken are increasing levels of flood risk.

In addition to their statutory duties, the Environment Agency Wales has a number of what are called permissive powers. These are powers that allow them to carry out a course of action, but do not compel them to and include:

- Powers to request information;
- The ability to raise levies for local flood risk management works, via the Regional Flood and Coastal Committees;
- Powers to designate certain structures or features that affect flood or coastal erosion risk;

- The expansion of powers to undertake works to include broader risk management actions; and
- The ability to cause flooding or coastal erosion under certain conditions.

This new allocation of responsibilities is also consistent with the EAW's role in relation to the Flood Risk Regulations 2009, which allocates specific responsibility for conducting assessments in relation to mapping and planning the risks of flooding from main rivers, the sea and reservoirs to the EAW as well as providing guidance to Local Authorities on these matters for flooding from other sources.

Under the Regulations the Environment Agency Wales also take on an assessment and coordination role at a national level, ensuring the correct information is passed back to the European Commission.

The Environment Agency's Local Operational Role includes being a coastal erosion risk management authority, emergency planning, advising on the planning process and managing flooding from main rivers, reservoirs and the sea.

7.1.1 Coastal Erosion Risk Management Authority

EAW is a coastal erosion risk management authority with the power to protect land against coastal erosion and to control third party activities on the coast. This includes the construction of private defences or the removal of beach material. Importantly since October 2011 Lead Local Flood Authorities have required Environment Agency approval to undertake coastal protection works.

7.1.2 Emergency Planning

EAW contributes to the development of multi-agency flood plans, which are developed by Local Resilience Forums (LRFs) to help the organisations involved in responding to a flood to work better together. They also contribute to the National Flood Emergency Framework for England and Wales which includes guidance on developing and assessing these plans.

They are responsible for providing advice to planning authorities in development and flood risk; providing fluvial and coastal flood warnings; monitoring flood and coastal erosion risks and supporting emergency responders when floods occur.

They work with the Met Office to provide forecasts and warnings of flooding from rivers and the sea in England and Wales.

The EAW and other asset operating authorities also have a role in proactive operational management of their assets and systems to reduce risk during a flood incident.

7.1.3 Main Rivers

Main Rivers are a statutory type of watercourse. A main river is defined as a watercourse marked as such on a main river map designated by Defra (Under the Water Resources Act 1991), and can include any structure or appliance for controlling or regulating the flow of water in, into or out of a main river. The EAW has powers to carry out flood defence works apply to main rivers only. The overall responsibility for maintenance of Main Rivers, however, lies with the riparian owner.

The EAW can also bring forward flood defence schemes through the Regional Flood and Coastal Committees, and it will work with Lead Local Flood Authorities and local communities to shape schemes which respond to local priorities.

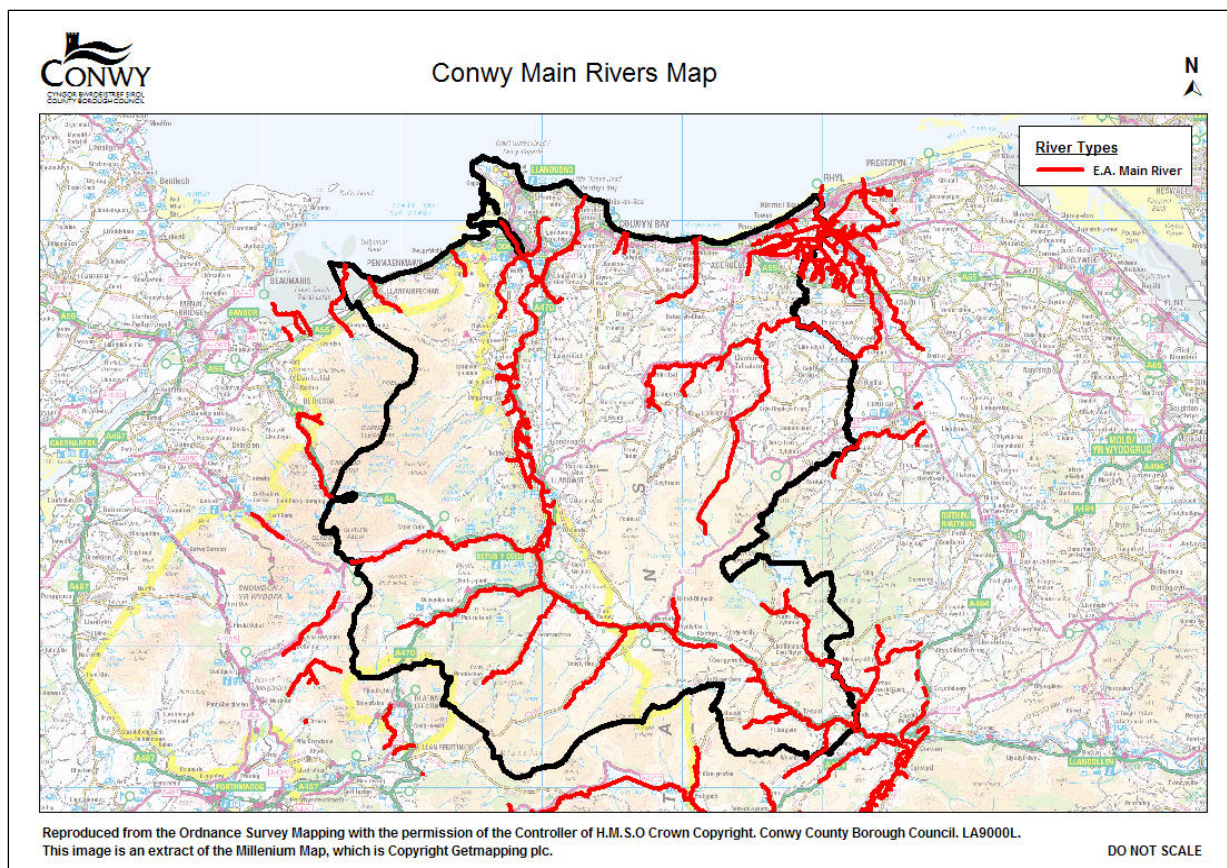


Figure 7.1: Map of main rivers from EA Datashare website

7.1.4 Coastal Flooding

EAW is the lead organisation responsible for all flood and erosion risk management around the coastline of Wales, including tidal flood risk. EAW leads the country in developing a coastal management plan that works at local, regional and national level, with partner organisations, including local authorities, putting agreed plans into practical action.

EAW also has a regulatory role in consenting works carried out by others in, or adjacent to water courses and sea/tidal defences to ensure that they have regard to flood risk and do not cause unnecessary environmental damage or impacts.

7.1.5 Reservoirs

The EAW enforces the Reservoirs Act 1975, which is the safety legislation for reservoirs in the United Kingdom. EAW is responsible as the Enforcement Authority for reservoirs that have a storage capacity

greater than 25,000 m³ (above the natural level of the surrounding land) and, once the relevant parts of the Flood and Water Management Act have been commenced, reservoirs with a capacity of 10,000 m³.

As the Enforcement Authority the EAW are responsible for:

- Maintaining a register of reservoirs, and making this information available to the public;
- Ensuring that reservoirs are designed and constructed using the correct design standards;
- Ensuring that the owner (undertaker) has appointed an engineer to inspect the reservoir periodically;
- Ensuring that the owner commissions regular inspections of the reservoir by an inspecting engineer;
- Ensuring that the owner carries out essential works required in the 'interests of safety' as soon as practicable under the supervision of a qualified civil engineer (from an inspecting engineer panel);
- Influencing, warning, cautioning and ultimately prosecuting non-compliant owners;
- Commissioning construction engineers, supervising engineers, inspecting engineers and essential works required in the 'interests of safety' in the event of non-compliance and recouping costs incurred from the owner;
- Producing a biennial report about our enforcement and operational activities to the Department for Environment, Food and Rural Affairs (Defra) and to the Welsh Government; and
- Acting in an emergency if the owner fails to take appropriate action.

The Environment Agency has now produced reservoir flood maps which show the effects on the downstream catchment of a dam breach for approximately 2000 large raised reservoirs which they regulate under the Reservoirs Act 1975. These have been sent to reservoir owners and the relevant local authorities.

7.1.6 Single Environment Body for Wales

The Welsh Government is currently reviewing the role of the environmental public bodies operating in Wales; primarily the EAW, the CCW and the Forestry Commission Wales. The WG's intention in doing this is to undertake an efficiency drive and merge the three bodies together and establish one single environment body for Wales.

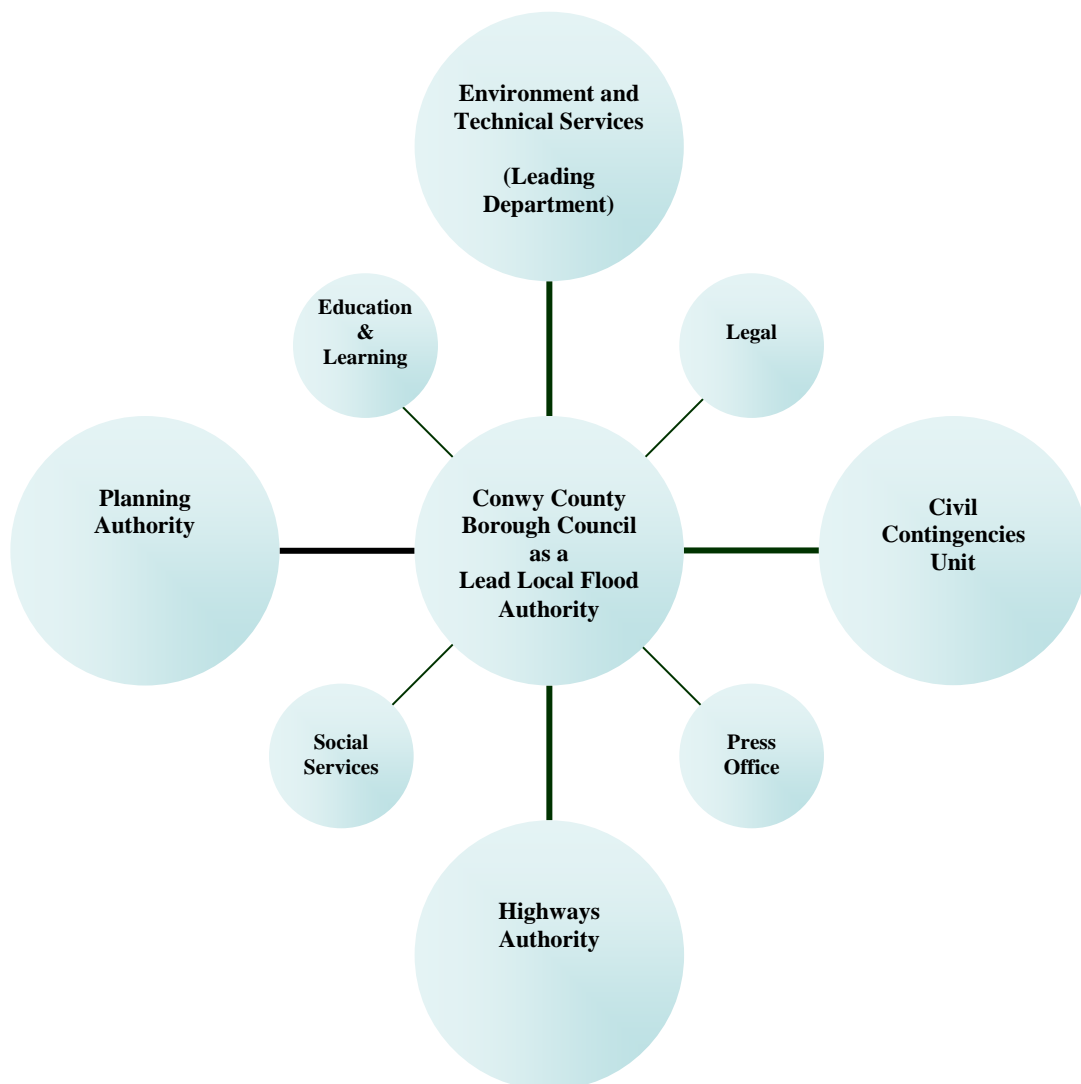
When established, the new organisation Natural Resources Wales (Cyfoeth Naturiol Cymru) will become operational on 1st April 2013. Natural Resources Wales (NRW) would take on the functions of these three organisations insofar as they operate in Wales. This new body would take on all of the responsibilities of the Environment Agency in relation to flood and coastal erosion risk management in Wales.

7.2 Powers and Responsibilities of Conwy County Borough Council



The Flood and Water Management Act 2010 identified Conwy County Borough Council as the Lead Local Flood Authority for the district. They are responsible for taking the lead in managing flood risk from local sources. This includes surface water, groundwater and ordinary watercourses and also where there is an interaction between these sources and main rivers or the sea. CCBC also has other related roles in emergency planning, regulatory services and road drainage which are detailed in the following sections.

Following implementation of the Act, the Cabinet members for CCBC chose Environment and Technical Services (ETS) department to take the lead in ensuring the Council's compliance with legislation and to ensure that all relevant departments and external agencies assist to fulfil the requirements of this Act. ETS already carried out similar duties and had formed the necessary relationships with other departments and external bodies to undertake this role. The diagram below illustrates many of the departments within CCBC that have a part to play in reducing flood risk and implementing the Act as a Lead Local Flood Authority.





7.2.1 As a Lead Local Flood Authority

The FWMA 2010 identifies CCBC as the LLFA for the administrative County of Conwy. This gave the council a number of **statutory duties** in overseeing the management of local flood risk from surface water, groundwater and ordinary watercourses such as streams and ditches (including lakes and ponds). It also gave CCBC a number of **permissive powers** which allow them to do something, but do not compel them to and are defined in Table 7.1 below:

| Statutory duties | Permissive powers |
|---|--|
| <ul style="list-style-type: none"> ■ Strategic leadership¹⁸; ■ Comply with the National Strategy¹⁹; ■ Co-operate with other authorities²⁰; ■ Recording and investigating flood incidents²¹; ■ Keep a register of assets likely to affect flood risk²²; and ■ Contribute to sustainable development²³. | <ul style="list-style-type: none"> ■ Powers to designate structures and features that affect flood or coastal erosion risk; ■ Powers to request information; ■ The expansion of powers to undertake works to include broader risk management actions; and ■ The ability to cause flooding or coastal erosion under certain conditions. |

Table 7.1: Conwy County Borough Council Statutory Duties and Permissive Powers

LLFA in Wales will also take on the role of the SuDS Adopting and Approving Body (SAB) in relation to sustainable drainage systems. In this role they will be responsible for both approving the original design of the SuDS and adopting and maintaining the finished system.

The minimum statutory content of Local Strategies is set out in Section 10 of the FWMA and LLFA's are required to consult with the public in preparing them.

A number of Local Authorities in Wales are also designated coastal erosion risk management authorities under the Coast Protection Act 1949, providing them with certain responsibilities in respect of coastal erosion and coastal protection. Formally referred to as Coastal Protection Authorities they may also be referred to as Coastal Local Authorities or Maritime Authorities and retain their current permissive powers in relation to coastal erosion risk management.

Some of these duties and powers which require more detail have been explained in the following section.

¹⁸ Section 10(1) of the Flood and Water Management Act 2010
¹⁹ Section 10(5) of the Flood and Water Management Act 2010
²⁰ Section 13 of the Flood and Water Management Act 2010
²¹ Section 19 of the Flood and Water Management Act 2010
²² Section 21 of the Flood and Water Management Act 2010
²³ Section 27 of the Flood and Water Management Act 2010

7.2.2 Environment and Technical Services

Environment and Technical Services (ETS) have taken the lead in delivering and implementing the requirements of the Act. This task requires input and a partnership of working with the other relevant departments in CCBC. Some of the tasks outlined in the following sections have been core activities for the council for a number of years and processes are in place to deliver those tasks. Other tasks, however, relate to the new responsibilities which have recently been assigned and will require new processes to be developed and implemented.

7.2.2.1 Strategic Leadership

CCBC is responsible for co-ordinating and overseeing flood risk management on a day to day basis across the County. In practice CCBC took the lead in dealing with groundwater, surface water and ordinary watercourse flooding incidents prior to the changes contained within the FWMA; however the responsibility has now been allocated to CCBC by law. At the onset, this involves developing this strategy which will set out CCBC's approach to dealing with flooding identified under the Act. It also involves ensuring all flood risk authorities are aware of their responsibilities, monitoring progress and activity by all organisations involved and communicating with the public and between organisations.

CCBC are involved in several partnership groups across Conwy which provide an opportunity for councillors to bring flood risk issues raised by their constituents to the attention of ETS and discussions are held to identify solutions and responsibilities. These include the Conwy Valley, Llandudno and Morfa Rhuddlan West Flood Partnerships.

CCBC are members of The Conwy Drainage Group along with the other Flood Risk Authorities for Conwy. The group was formed to improve communications between the FRA's to deal with reported flood incidents and assign the responsible authority to deal with the incident. The group invite select councillors to the meetings to focus on specific flood risk areas on a biannual basis.

7.2.2.2 Recording of Flood Incidents

To assemble an accurate picture of flood risk across Conwy requires the collection of precise and useful records from actual flood incidents occurring across the County.

An LLFA has a duty to record all sources of significant flooding events. The national definition of significant is unavailable therefore the decision whether or not to record a flood is at the discretion of the LLFA. CCBC have set a standard to record every flood incident that occurs in the county. A detailed investigation will be carried out when certain criteria are met, which is explained in more detail in the next section.

ETS categorise flooding into three types; flood incidents caused by overcapacity and / or blockages during storm events, land drainage issues caused by issues such as blockages that are not caused by storm events and drainage infrastructure related problems. CCBC have already begun to assemble a record of flood incidents which have been imported into an Asset Management System. CCBC will continue to update this system as and when flooding occurs and when combined with mapping of future flood risk in the county it will help provide a picture of the highest flood risk areas in Conwy.

Conwy Local Flood Risk Management Strategy

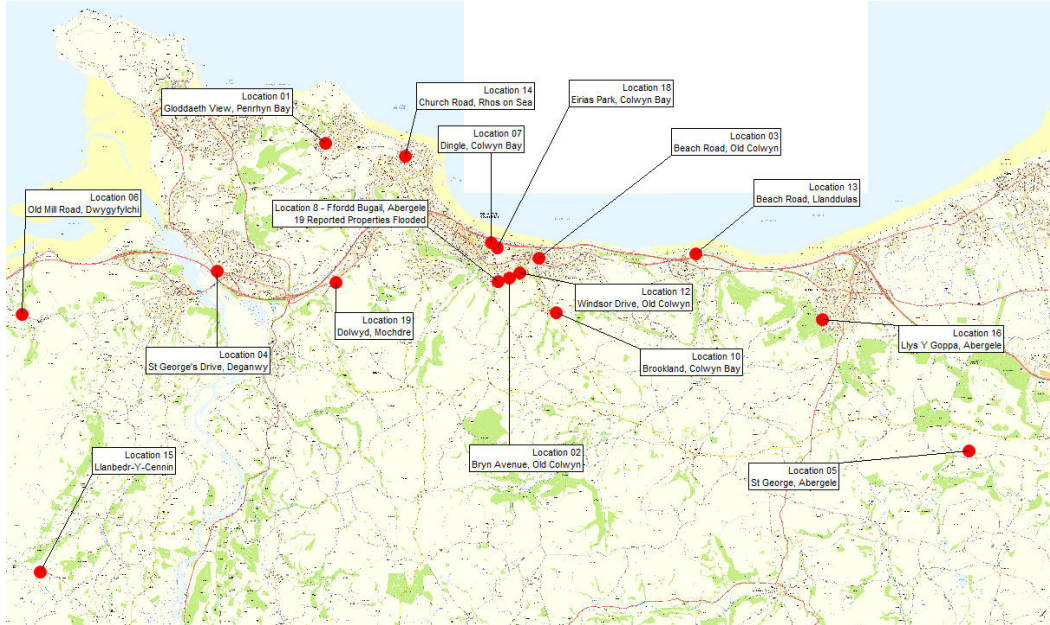


Figure 7.2: Example of map showing records of flood incidents in Conwy using an Asset Management System



Figure 7.3: A detailed view of a flooding incident recorded in the Asset Management System

Statutory bodies, such as DCWW will also receive and record information regarding flood incidents which may come under CCBC responsibility; therefore a process needs to be formulated so that this data can be efficiently shared across the authorities. The responsibilities of other relevant flood authorities are detailed in further sections of this strategy.

Partnership working and collaboration is an integral part of managing flood risk and is reflected in the duty to co-operate within the Act. The measure for the future is to build stronger links with local community groups, the public, landowners and private organisations that we expect to take a proactive involvement in flood risk management and provide us with information on flood incidents.

CCBC's aim is to obtain as much information on flooding incidents that occur across Conwy and in order to do this we encourage the public to use the Council's website to provide information that we may not be aware about.

In order to build consistent and accurate records of local flooding in Conwy we need as much information as possible on historical and recent floods from individuals, businesses and stakeholders.

If you become aware of a flood in your area, please provide us with the following information via floods@conwy.gov.uk or to complete the online form click on this link [Reporting a Flood](#)

Your name and contact details

- Date of flood;
- Location of the flood (map references or precise address);
- The duration of flood;
- The depth of flood at its worst;
- Where did the water come from? e.g. overflowing river;
- What was the weather preceding the flood, rainfall if known;
- Did water enter a property? Which ones;
- What damage did the flooding cause? e.g. blocked road for several hours;
- Was any action taken at the time to reduce the flood risk? e.g. flood gates;
- Any other relevant information; and
- Photographs and videos of the flood and damage preceding the flood.

7.2.2.3 Investigation of Flood Incidents

An LLFA has a duty to investigate all sources of significant flooding events. The national definition of significant is unavailable therefore the decision whether or not to investigate a flood is at the discretion of the LLFA and the comprehensiveness of the investigation will be adjusted to reflect the significance of the incident and the resources available. In the event of very widespread, significant flooding affecting large areas of Conwy, our ability to investigate every incident in detail is likely to be severely limited.

The aim of flood investigations is to bring all useful information together in one place, providing an understanding of situations, outlining possible causes of flooding and potential long-term solutions to protect people and their homes from flooding. Further recommendations will also be made to highlight potential flood risk management actions. Reports will provide a clear and thorough understanding of flooding situations, but our duty to investigate does not guarantee that problems will be resolved and cannot force other authorities into action.

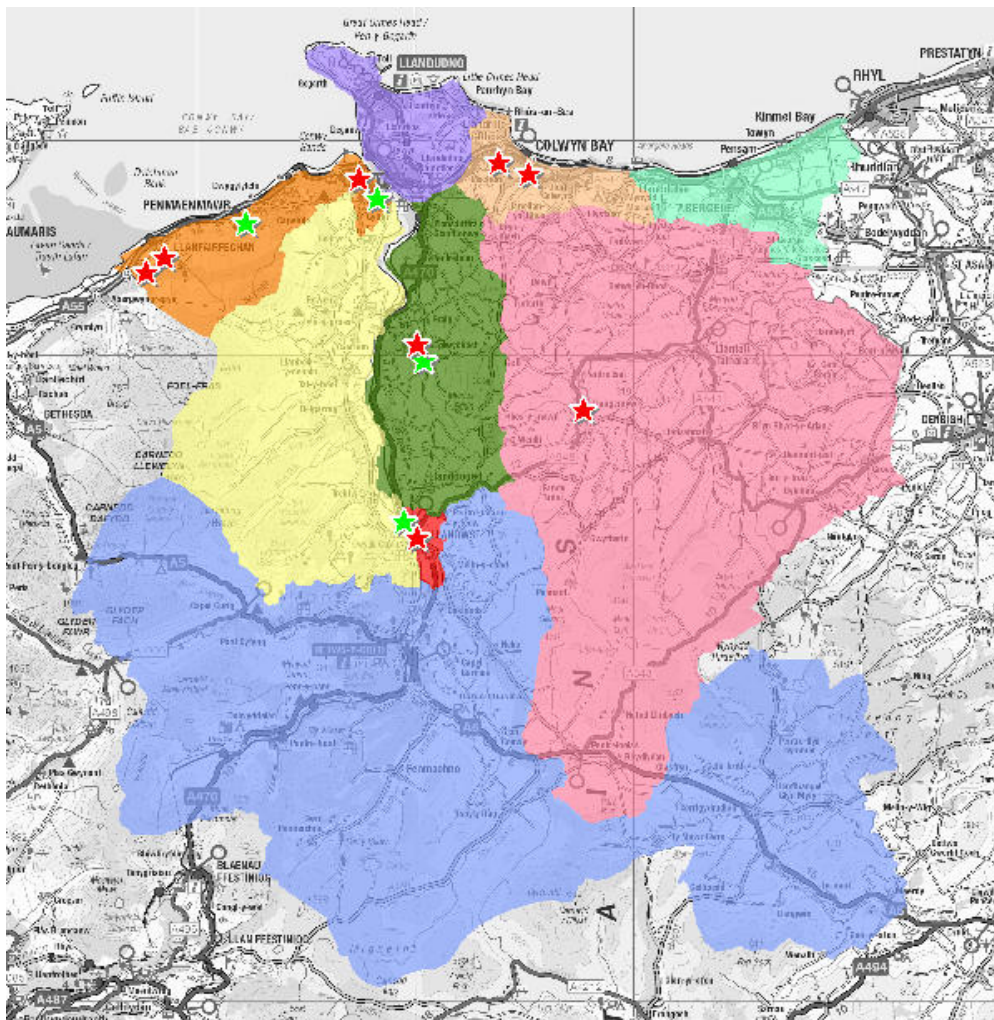


Figure 7.4: Example of map showing records of flood investigations in Conwy using the Asset Management System

A flood investigation will involve consultation with the relevant risk management authorities, landowners and private organisations involved, all of whom will be expected to cooperate and provide comments.

There are 5 stages of flood investigations for flooding incidents and land drainage issues in Conwy:

- **Stage 1:** Carry out an initial assessment; including a site inspection to identify what the problem is;
- **Stage 2:** Carry out a detailed investigation (Flood Investigation Report) to identify the source of flooding, how many properties are affected, and what Measures can be carried out to prevent it. This report will be published;
- **Stage 3:** Apply for funding for a feasibility study of alleviation schemes (if deemed appropriate);
- **Stage 4:** Detailed design of the flood risk management / alleviation scheme (subject to funding); and
- **Stage 5:** Implementation of the Flood Risk Reduction Scheme (subject to funding).

Stage 1 – Initial Inspection

Once an incident of flooding or drainage issue has been reported and recorded, if it is unclear which authority holds responsibility for managing the incident or it has been identified that Conwy is the responsible authority; a site inspection will be carried out to identify the cause of the problem. If it is clear that another authority is responsible or a report has been submitted from the responsible authority; a site inspection is not necessary.

If an inspection is carried out, it will ascertain which authority has an involvement in the flood incident, and outline their responsibility. CCBC will record every flood incident that occurs in the county using a Site Inspection Report which will include various fields for information and flood officer notes. The Asset Management System will then be updated with this information.

On completion of the Stage 1 inspection, a decision will be made as to whether a more detailed investigation is required in the form of a Flood Investigation Report. This would initiate Stage 2 of the investigation process.

Stage 2 - Detailed Investigation

For Stage 2 investigations, a Flood Investigation Report is required, which aims to bring all useful information together in one place, providing an understanding of the incident, outline possible causes of flooding, highlight which authority has an involvement in the flood incident, and identifying potential long-term solutions.

A detailed investigation should be carried out where the following eligibility criteria are met, or it is in the public interest to do so:

- Where there is a risk to life as a result of flooding; or
- Where there is ambiguity surrounding the source or responsibility of a flood incident; or
- Where internal flooding of one property has been experienced on more than one occasion; or
- Where internal flooding has affected several properties during one single flood incident; or
- Where a major transport route was closed for more than 10 hours as a result of flooding; or
- Where critical infrastructure (e.g. power station) was affected by flooding for more than 10 hours.

During widespread flooding, the method for prioritising flood investigations will initially be based on the following flood characteristics:

- The number of properties flooded internally; and
- The frequency of flooding based on historic records from the past 10 years.

Once completed all Flood Investigation Report's will be published on CCBC website at <http://www.conwy.gov.uk/flooding> and copies will be available for review at Council offices.

Stage 3 – Cost / Benefit for Potential Scheme

Depending on the outcome of the flood investigation carried out in Stage 2, a Project Appraisal Report (PAR) may be recommended to assess possible long term solutions to a given flooding issue. The PAR is used to assess the cost / benefit ratio of several options for a flood risk reduction scheme, and is used as a driver to Welsh Government funding to design and implement the preferred solution.

Completion of a Stage 3 investigation is subject to funding approval from the Welsh Government, and through the democratic process within Conwy County Borough Council.

It is important to note that completion of a PAR is no guarantee that future funding will be available to design and implement the flood risk reduction scheme.

Stage 4 – Detailed Design

Stage 4 is initiated if a positive solution has been identified in the PAR. Once identified, CCBC will seek funding to take the concept identified in Stage 3, and produce a detailed design.

Stage 5 – Implementation of the Flood Risk Reduction Scheme

The final stage of the investigation process is to complete and implement the scheme. Stage 5 is subject to funding and although Stages 3 & 4 are completed, there is no guarantee that funding will be made available to complete the scheme.

Once funding has been made available, the scheme will be completed and all flood risk assets associated to the scheme will have maintenance programmes applied to them to minimise the risk of blockages and/or failures of the assets.

The flooding investigation procedures that has been summarised above will form the basis of a Flood Investigation Procedure Plan that will be scheduled and completed as part of the LFRMS Action Plan.

7.2.2.4 Register of Flood Risk Assets

An asset in the context of flood risk management is an artificial or natural structure that works as a flood defence or as part of a drainage system or other feature considered likely to have a significant impact on flood risk. An example could be a trash screen, culvert, pumping station, walls or banks of a river channel.

Conwy County Borough Council is required to keep an **asset register** of structures or features which it considers are likely to have a significant effect on local flood risk. Information on ownership and state of repair will be held on the register and it will be made available for inspection by the public at all reasonable times.

The register will take the form of a live database, which will be constantly updated in the light of flood incidents, flood investigations and changes to infrastructure. New sustainable drainage assets will be recorded via the SuDS approval process and asset data may also be captured through local studies, such as the Surface Water Management Plans. In the first instance the recording of assets will be prioritised by its location; future flood risk mapping and known flood risk areas taken from the Preliminary Flood Risk Assessment will be used to analyse the 'significance' of each flood risk asset. The vulnerability of the asset's surroundings will also be used to determine the consequences of its failure.

The council is also required to keep an **asset record** for use by risk management authorities. The record will provide further information about each asset and contact details for the owner or maintainer. This database will be used to investigate cases where flood risk asset issues have been reported.

Assets require inspection and maintenance in order to prevent failure, which can otherwise be caused by deterioration or increased frequency and magnitude of flooding. There has often been much confusion over the ownership and maintenance responsibility of local flood risk assets. This is likely to be due to local drainage infrastructure commonly being hidden underground or along land boundaries, where landowners either do not realise or acknowledge that they have any responsibility.

Within Conwy most of the coastal defence assets are the responsibility of CCBC, Network Rail (particularly in Towyn / Kinmel Bay) or private land owners. Network Rail only has a responsibility to protect the railway line although their defences provide protection to a large number of properties. The trunk road agency have some defences (usually where the road is the seaward development around headlands such as Pen-y-Clip) while EAW have river embankments on the Clwyd and Conwy Rivers which provide tidal protection.

It will take many years before the register is sufficiently comprehensive to be of real value in flood risk management. Conwy County Borough Council has begun to populate a register of all existing information on structures that are likely to have a significant effect on flood risk. These assets include:

- Coastal defences;
- Ordinary watercourses on CCBC owned land;
- Fluvial assets on CCBC owned land;
- Demountable defences; and
- Maintenance schedules.

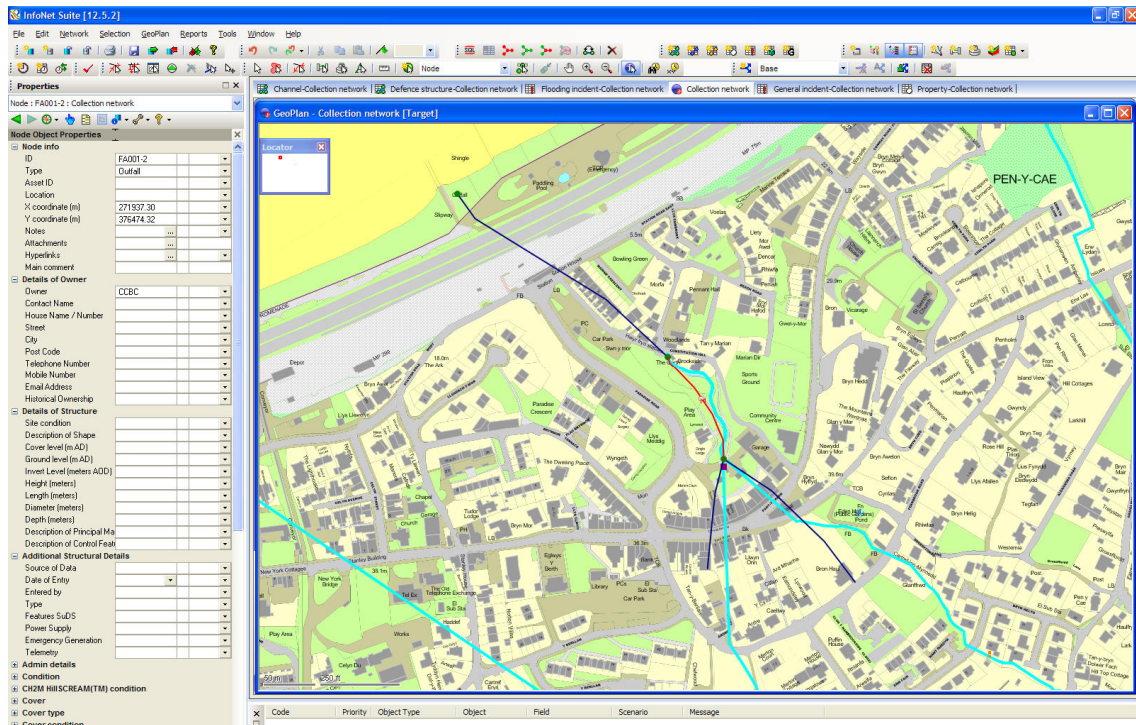


Figure 7.5: Example of a flood risk asset recorded in the Asset Management System

CCBC will develop a standard inspection form to be completed every time an inspection or maintenance is carried out. An example of how each asset will be audited is:

- Review all existing information on an asset and transfer to the Asset Management System;
- Carry out a structural survey of each asset to establish dimensions, structural condition, materials and layout;
- Confirm whom is responsible for each asset by way of land searches and discuss maintenance with the landowner;
- Carry out a risk assessment for each asset;
- Consider any improvement works that are required for each asset; and
- Develop an appropriate maintenance plan for each asset.

The register will be published on the CCBC website and will also be available to view at Council offices.

7.2.2.5 Sustainable development

CCBC has a duty to aim to contribute towards the achievement of sustainable development in the exercise of flood or coastal erosion risk management functions and to have regard to the Welsh Ministerial guidance on this topic.

The guidance provided, *Sustainable Development: Guidance to Risk Management Authorities Section 27 – Sustainable Development Nov 2011*, does not prescribe a single approach that must be followed, rather it provides a variety of suggestions of how to aim to make a contribution towards the achievement of sustainable development while carrying out duties in managing local flood risk under the Act.

The ways in which CCBC will work towards achieving sustainable development in the FCERM role are described in Section 10.

7.2.2.6 Designating Assets

The relevant clauses of the Flood and Water Management Act have now been commenced (August 2012), therefore empowering Conwy County Borough Council and the Environment Agency Wales as 'designating authorities'. That is, they have the permissive powers to 'designate' features or structures which they consider affects flood risk and it is not owned by the LLFA or the Environment Agency.

If an asset becomes 'designated' its owner cannot alter, remove or replace a designated structure or feature without the consent of the designating risk management authority. The aim of designating flood risk assets is to safeguard them against unchecked works which could increase flood risk in the area. Designation of features or structures is not something that will be done regularly but only conducted when it is deemed that there are concerns about the asset.

Note: designation of an asset does not mean there is a duty on anyone to maintain it in its current condition.

7.2.2.7 Meeting the Flood Risk Regulations

The Flood Risk Regulations 2009²⁴ (FRR) replicate the allocation of responsibility of local flood risks and have allocated specific responsibilities for conducting assessments. All LLFA are required to produce a Preliminary Flood Risk Assessment (PFRA). The first PFRA was written in June 2011 and published in December 2011 and can be found in the following location:

<http://publications.environment-agency.gov.uk/PDF/FLHO1111BVEY-E-E.pdf>

The information contained within will be reviewed in 2017 and every six years thereafter. The Flood Risk Regulations also require that all LLFA's prepare Flood Hazard and Flood Risk Maps for any indicative Flood Risk Areas to be published by December 2013. This will be followed by a Flood Risk Management Plan which will be published in December 2015.

²⁴ Flood Risk Regulations 2009

7.2.2.8 Consenting Works on Ordinary Watercourses

CCBC are responsible for the regulation of ordinary watercourses. This includes issuing of consents for any changes to ordinary watercourses that might obstruct or alter the flow of an ordinary watercourse and enforcement action to rectify unlawful and potentially damaging work to a watercourse.

This role was previously held by the EA but has been transferred to enable the LLFA to implement their new roles and responsibilities in respect to local flood risk. The EAW still retain their responsibility of consenting works on main rivers.

If riparian owners or other bodies wish to culvert an ordinary watercourse or insert any obstruction, consent is required. The purpose of ordinary water course regulation is to control activities that may have an adverse flooding impact.

It is essential that anyone who intends on carrying out works either temporary or permanent in, over, under or near a watercourse or flood defences (including sea defences) obtain any necessary consents before commencing works. Consents on forms of obstruction identified by the Land Drainage Act will be charged. Riparian owners are encouraged to contact the Flood Risk Management Team to discuss any applications, and an application form will be available on the Conwy County Borough Council website at:

www.conwy.gov.uk/flooding.

It is widely recognised that culverting has many adverse effects and applications to culvert a watercourse will generally only be granted where it has been demonstrated that there is no viable alternative, that there is an overriding requirements for the works and that mitigation measures have been proposed, and considered by CCBC to be acceptable. The Authority supports a general statement to discourage culverting of watercourses as follows:

'Culverting of existing watercourses within Conwy County Borough Council will not be permitted under Section 263 of the Public Health ACT 1936 unless satisfactory evidence is provided to demonstrate that any adverse affect can be adequately mitigated and that a continuing maintenance regime is in place.'

7.2.2.9 As SuDS Approval Body (SAB)

Sustainable drainage systems (SuDS) are a change of approach from conventional drainage which aimed to convey water as quickly as possible from a development, often causing watercourses downstream to overload and potentially cause flooding. The key principles that influence the planning and design of SuDS are:

- Storing runoff and releasing it slowly (attenuation);
- Allowing water to soak into the ground (infiltration);
- Slowly transporting (conveying) water on the surface;
- Filtering out pollutants; and

- Allowing sediments to settle out by controlling the flow of the water²⁵.

SuDS are also an opportunity to ensure that amenity and biodiversity are considered with the same importance as managing volumes of water.

The Flood and Water Management Act 2010 assigns Conwy County Borough Council the role of a SuDS Approval Body (SAB) for the county of Conwy. When this aspect of the Act is enacted (expected by April 2013) full details of how this will be implemented will be agreed with partners and publicised widely. The SuDS approval process will be integrated with the planning process; with discussions commencing at the earliest possible stage.

It is expected that any development requiring planning permission will require a drainage approval and that when the SAB is established, it will be required to:

- Assess the drainage design for all construction work which has drainage implications;
- Adopt all SuDS schemes which connect more than one property; and
- Ensure that all adopted SuDS schemes are properly maintained.

SuDS draining public roads will be adopted by the Highway Authority. The Environment Agency is a statutory consultee for the approval process for developments located within Flood Zone C1 and C2 or for any development site occupying an area greater than 1 ha and must respond within 21 days of being contacted about an application.

An important provision in the Flood and Water Management Act 2010 includes the removal of the automatic right to connect to surface water sewer systems; instead connection to an existing sewer network is conditional on the SAB approving the drainage system.

Drainage is a complex issue and should be considered at the earliest stage of the development process. CCBC will be producing a local SuDS Design Guide in accordance with National Standards on SuDS, to advice on what the expectations are for the design of drainage, which is expected to be out for consultation in 2013 after national guidance has been provided following the enactment of the SAB.

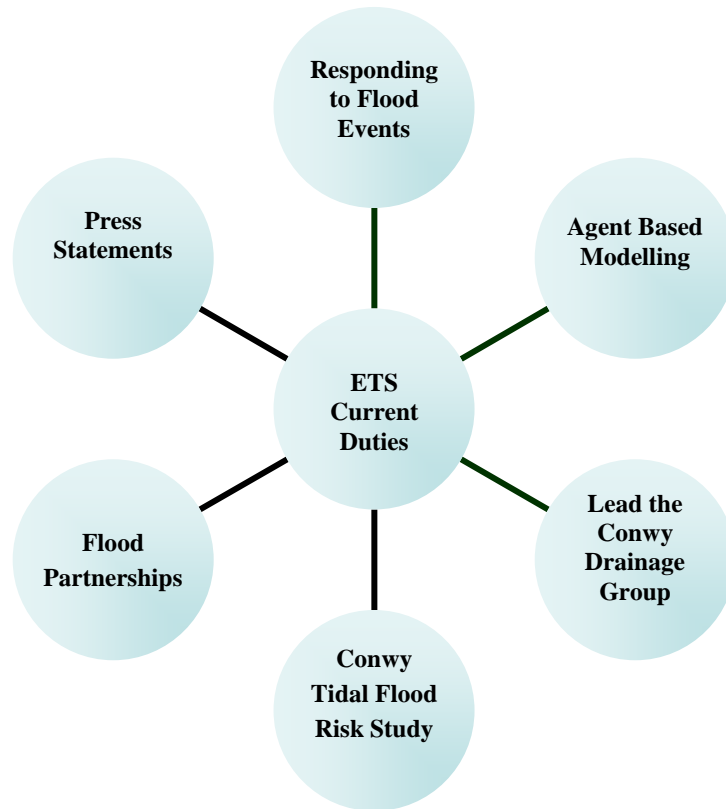
There will then be a trial period to ensure the SuDS functions to its design specifications before adoption takes place. Once adoption has taken place, maintenance will be the responsibility of CCBC and will be done either by itself or by a contracted provider.

Note: CCBC are waiting for additional information and guidance from Welsh Government regarding the adoption of SuDS therefore the information above is subject to change.

²⁵ http://www.ciria.com/suds/suds_principles.htm

7.2.2.10 Environment and Technical Services other Duties

ETS also have other duties relating to flooding that are not new specific duties under the Act; these are detailed in the following sections.



Responding to Flood Events

Flood events are usually preceded by flood warnings from the EAW and / or the Met Office. If a significant event is expected, a teleconference is usually held with the EAW, Met Office, Emergency Responders, CCBC ETS, Highways and Civil Contingencies Unit to discuss likely issues.

During Council work hours flood calls come into the Environment Advice Team and out of hours go through to the Careline Service and are reported to one of the two flood duty officers on call. If a severe warning is received or if incoming calls are too numerous to be dealt with by the on call officers then the decision will be made to open the flood room at ETS. If it is out of hours the flooding calls will be diverted back to the Environment Advice Team. The Highways Department will usually have a presence in the flood room to coordinate resources during a major event.

Where possible additional resources may be sourced in advance of such an event, this could include utilising Parks Staff as often weather conditions will be unsuitable for their normal daily work. Sandbag stocks will be checked and replacements ordered if required. Checking council trash screens is carried out before the event if possible and key locations will be visited during the event. Most of the department’s vehicles have tracking devices fitted to coordinate the nearest team to respond to the flood incident.

Response to flood calls can involve clearing trash screens, pumping or delivering sandbags. We may find that other parties have a responsibility to respond to flooding incidents so we will contact the relevant party (i.e. informing DCWW of sewer flooding / pumping station problems). Sandbags are only delivered to residential properties at immediate risk of internal flooding and only during an event. It is recommended that people provide their own protection where possible to make their property more resistant and resilient to flooding, more detail is given in Section 7.6. Highways & Infrastructure Services and ETS both have sandbag supplies and are responsible for collecting and disposing of the sandbags they issue following the event.

Agent Based Modelling

An agent-based model is a computational method for simulating the behaviour of people in flood events. The model estimates the likely exposure of people to flooding during an event and provides a risk-based approach to appraising the benefits of flood incident management response measures.

CCBC hope to undertake a pilot scheme of agent based modelling combining the Conwy Tidal Flood Risk Assessment which would be used to help plan evacuation procedures for the parts of Conwy County.

Coast and Land Drainage Inspections

CCBC are responsible for many of the coast defences in the county. The coastline is split into 10 coast protection areas and the inspector for each area carries out inspections of all defences (both council and non-council assets) on a risk based schedule. The highest priority defences are inspected four times per year and all defences are inspected at least once a year. Following a coastal storm any areas which are likely to have been affected have an additional inspection. Any defects identified are prioritised and sent to the term contractor for coastal repairs for action.

Where a watercourse runs through council owned land the same riparian responsibilities apply to the council as any other landowner. There is a regular maintenance regime for all council watercourses and inspection of trash screens is a particularly important role to ensure that blockages do not occur which could increase flood risk. During flood events weather conditions often cause blockages to occur rapidly and regular inspection of trash screens during flood events is usually the first priority to proactively prevent flood issues occurring. It is not possible to inspect all non-council owned watercourses but where maintenance issues are reported the land drainage officer for the area will arrange for an inspection to be carried out. Where maintenance is necessary the riparian land owner will be informed of their duties under the Land Drainage Act to carry out works. CCBC has powers to enforce necessary works to be carried out if they are not completed in a reasonable length of time.

Lead the Conwy Drainage Group

Conwy organise and chair meetings for the Conwy Drainage Group which was set up to provide more cooperation between flood risk management authorities (as they are now called). The group is to prevent flooding issues being passed around with no resolution. County Councillors are invited to raise any flooding issues within their ward and representatives from Environment & Technical Services, Highway & Infrastructure Service, Regulatory Services, DCWW and the EAW discuss which party(ies) have responsibility for the issue and are assigned actions. Other flood related issues can be raised such as the requirements of the Flood & Water Management Act, DCWW sewer transfer or planned schemes by Environment & Technical Services or DCWW.

Conwy Tidal Flood Risk Study (CTFR Study)

This study was funded by CCBC Planning Department and carried out in consultation with the EAW. Its aim was to more accurately portray the coastal flood risk within the county where national flood maps from the EAW showed high risk for large areas. The first stage looked at the standard of coastal defences throughout the county (defences were not taken into account by the national mapping) and the highest risk areas of Llandudno and Pensarn to Kinmel Bay were taken forward to the second stage where flood maps were created based upon TAN15 planning criteria. After present day flood risk maps were produced climate change was assessed – 50 years for Llandudno and 100 years for Pensarn to Kinmel Bay.

Flood Partnerships

There are currently 3 flood partnerships within Conwy led by the Civil Contingencies Unit. The Conwy Valley Flood Partnership was set up following the 2004 and 2005 Llanrwst floods. The group produced the Conwy Valley Flood Plan which has some very specific details such as pumping locations. The Morfa Rhuddlan Flood Partnership covers the areas affected by the 1990 Towyn Floods. A draft Morfa Rhuddlan Flood Plan has been created by the group; this has more emphasis on evacuation procedures than the Conwy Valley Plan. This group is hoping to use the agent based modelling study to build into the emergency plans. The Llandudno Flood Partnership was set up in 2012 and again the aim is to produce a flood plan for the area.

Press Statements

Information about flooding is passed through to the press office to release statements to the local newspapers. For extreme events a CCBC representative is nominated to appear on the radio and the television.

7.2.3 In Carrying out Emergency Planning

The introduction of the Civil Contingencies Act 2004 required a restructure of joint-agency planning in Wales. This resulted in the creation of Local Resilience Forums (supported by various co-ordinating groups) based on the four police force areas in Wales.

CCBC Civil Contingencies Unit (CCU) works closely with the North Wales Resilience Forum (NWRf), which was established in March 2005. The membership of the NWRf is made up of the strategic level managers of each of the Category 1 responders (Local Authorities including CCBC, Police, Ambulance, Local Health Boards, Fire & Rescue Services and other relevant bodies). Its overall purpose is to ensure that there is an appropriate level of preparedness to enable an effective multi-agency response to emergencies including floods which may have a significant impact on the communities of North Wales.

The Resilience Forum's specific objectives are²⁶:

- To agree on joint strategic and policy approaches relating to North Wales' preparedness and response;
- To approve the Community Risk Register (CRR), and ensure it provides a robust basis for planning;
- To ensure that appropriate multi-agency plans, procedures, training and exercises necessary to address identified or foreseeable local and wider area hazards are in place and outstanding gaps identified;
- To direct and oversee the activities of working groups as they are established and allocate measures to them as appropriate;
- To receive reports from the working groups on current threat levels, gaps in planning and progress on actions measured;
- To ensure that appropriate resources are made available to working groups to fulfil statutory and measure-based responsibilities;
- To co-ordinate the individual approaches and responsibilities of each organisation to ensure that they complement each other and dovetail with partners' arrangements; and
- To consider the implications of legislation, national initiatives and decisions of the Regional Resilience Forum for the North Wales Resilience Forum area.

The role of the CCBC CCU in terms of FCERM includes:

- Emergency planning responsibilities;
- Provision of a 24/7 Duty Officer system with Gwynedd County Council and Isle of Anglesey County Council;

²⁶ North Wales Community Risk Register 2012 Produced by North Wales Resilience Forum, Version 10 January 2012 – Final

Conwy Local Flood Risk Management Strategy

- The preparation of flood contingency plans which detail the arrangements for responding to a disaster or major flood incident in Conwy;
- Assess Conwy's risks in accordance with lead responsibility and coordinate local authority input to Community Risk Register;
- Develop Emergency Plans in accordance with lead responsibility;
- Develop local authorities Business Continuity Management arrangements;
- Develop arrangements for Civil Preparedness information available for public use with other relevant CCBC services;
- Working with communities to ensure that they are informed and prepared for civil emergencies such as flooding, and are able to recover following an emergency i.e. flood partnerships;
- Maintain system for warning, informing and advising public in event of an emergency;
- Share information with other Conwy responders;
- Co-operate with other Conwy responders to enhance co-operation and efficiency; and
- Provide advice and assistance to businesses and voluntary organisations about business continuity management. During and after an emergency.

CCBC CCU supports the Authority in the following during a crisis:

- Coordinate emergency support within their own functions;
- Deal with surface water and groundwater flooding, flooding from 'non main rivers';
- Work with the other Category 1 and 2 responders as part of the multi-agency response to floods;
- Coordinate emergency support from the voluntary sector;
- Liaise with central and regional government departments;
- Liaise with essential service providers;
- Open rest centres;
- Manage the local transport and traffic networks;
- Mobilise trained emergency social workers;
- Provide emergency assistance;
- Deal with environmental health issues, such as contamination and pollution;

- Coordinate the recovery process;
- Manage public health issues;
- Provide advice and management of public health;
- Provide support and advice to individuals; and
- Assist with business continuity. An increasingly important part of this role, supported by the Environment Agency and voluntary organisations, is to encourage the formation of local emergency groups.

In the event of a major flood emergency, the Council should be able to:

- Support the emergency services with evacuation;
- Provide temporary accommodation, including emergency feeding and rest centres;
- Provide social and welfare support to the vulnerable and persons suffering from stress or shock;
- Assist in the provision of body holding areas and a temporary mortuary in liaison with North Wales Police and the local coroner;
- Arrange temporary or permanent re-housing;
- Deal with and provide advice on health hazards and environmental issues;
- Assist in the response to public health matters;
- Ensure safety of highways and traffic and structural engineering related matters; and
- Provide any other services that normally fall within the day-to-day responsibilities of the Council.

7.2.4 As a Planning Authority

The functions of the Conwy County Borough Council Planning Authority are within two main departments; Planning Policy Services and Regulatory Services (Development Control).

The main role of Planning Policy Services (PPS) is to produce and monitor a Local Development Plan (LDP). The LDP is supported by a number of Background Papers and Supplementary Planning Guidance SPG documents. For all land allocations in the LDP, statutory bodies are consulted. The comments of EAW and the Council's Environment and Technical Service in relating to flood risk are considered in the assessment of development and whether sites are allocated or not.

The Planning Policy Services affects Flood Risk Management in the following key ways:

- Writing policy in the LDP regarding SuDS issues;
- Providing input into Environment and Technical Service plans such as Shoreline Management Plan;
- Identify links and potential land use allocations as part of the LDP considering flood risk;
- Assessing flood elevation works; and
- Responding to WG or EAW on consultations involving flooding issues as a service.

The main role of Regulatory Services (Development Control) is to process and determine planning applications, which includes the consideration of flood risk assessments. In the future, Regulatory Services (Development Control) will work alongside the SuDS Approval Body to assess planning applications and complementary drainage applications.

When considering flooding issues in the preparation of Local Plans, the Planning Authority needs to do the following:

- Produce a Strategic Flood Risk Assessment. This should consider not just fluvial and coastal flooding but also local flood risk issues. Where Critical Drainage Areas have been identified these will need to be included;
- Develop a LDP that carefully considers flood and coastal erosion risks. This is a statutory planning document which can be used to control inappropriate development in the floodplain. Consequently the LDP should support the Strategic Flood Risk Assessment (SFRA), the Preliminary Flood Risk Assessment and Surface Water Management Plan (where applicable). This should allow the LDP to assess and record the flood risks for new developments and steer development to areas of lowest flood risk. Equally there is requirement to assess risks from coastal erosion and permanent tidal inundation and where appropriate designate coastal risk management zones where permanent development will not be permitted;
- When assessing development, Planning Authorities should consider the following aspects: (a) the risk of all forms of flooding in the area, flood protection measures and the impact of climate change; (b) the justification for the location of development in a flood risk area; (c) the consequences of flooding in terms of risk to life, damage to property, safe access and ingress, and disruption; (d) the form and

layout of development, use of appropriate SuDS and water efficiency measures such as rainwater harvesting or use of local land drainage water where practicable;

- Consider the allocation of land for development in areas of lowest probability of flooding through embedding the sequential approach referred to in TAN 14 – Coastal Planning, and TAN 15 - Development and Flood Risk into the LDP;
- Safeguard land for critical infrastructure;
- Develop action plans, where necessary, to support sustainable spatial planning and ensure all plans are integrated and firmly linked to local strategies; and
- Ensure that neighbourhood plans fully consider flood risk issues;

When the SuDS Approval Body comes into force, the Planning Authority will:

- Alert developers and land owners at the pre-application stage of the need to consult with the SuDS Approval Body about drainage issues on the site;
- Send drainage applications (submitted with the planning application) to the SuDS Approval Body (subject to change depending on DEFRA application system proposals);
- Provide local guidance for the assessment of drainage matters in planning applications; and
- Advise Developers to discuss with the Lead Local Flood Authority whether land drainage consent is required for alterations or new structures within an ordinary water course.

7.3 Dŵr Cymru – Welsh Water



Dŵr Cymru – Welsh Water (DCWW) is the only company serving Conwy providing both water supply and wastewater services. DCWW is responsible not only for the provision of water, but also for making appropriate arrangements for the drainage of foul water, the treatment of waste, surface water sewers and combined sewers. They have primary responsibility for floods from water and sewerage systems, which can include sewer flooding, burst pipes or water mains or floods caused by system failures.

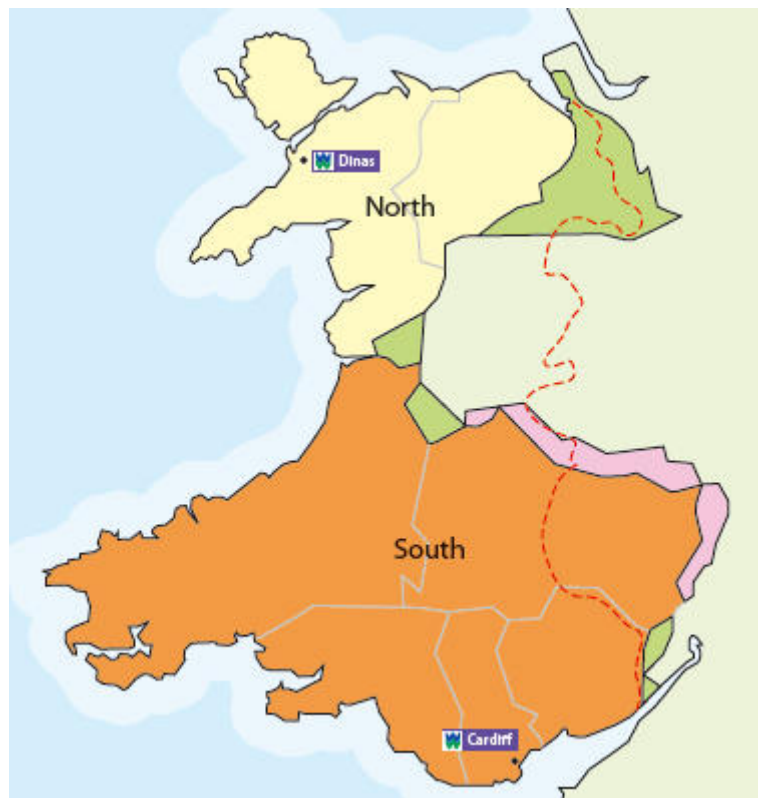


Figure 7.7: Dŵr Cymru Welsh Water boundaries (North and South)

The Flood and Water Management Act 2010 places a number of statutory duties on water and sewerage companies including:

- A duty to act consistently with the National Strategy;
- A duty to have regard to the content of the relevant Local Strategy; and
- A duty to co-operate with other relevant authorities in the exercise of their flood and coastal erosion risk management functions;

Water and sewerage companies often hold valuable information which could greatly aid the understanding of flood risks faced by communities across Wales.

7.3.1 Transfer of Responsibilities

The Water Industry (Schemes for Adoption of Private Sewers) 2011 Regulations facilitated the transfer of private sewers, lateral drains and pumping stations to Water and Sewerage Companies in England and Wales. The transfer is illustrated in Figure 7.8 below and shows a transfer of responsibilities from home owners to DCWW. Before July 2011 home owners were responsible for their private drains up to the point where they join the public sewer and where a pipe served several properties the home owners were jointly and equally responsible. Following July 2011 DCWW became responsible for the part that is outside the home owner's property known as lateral drains as well as the public sewer.

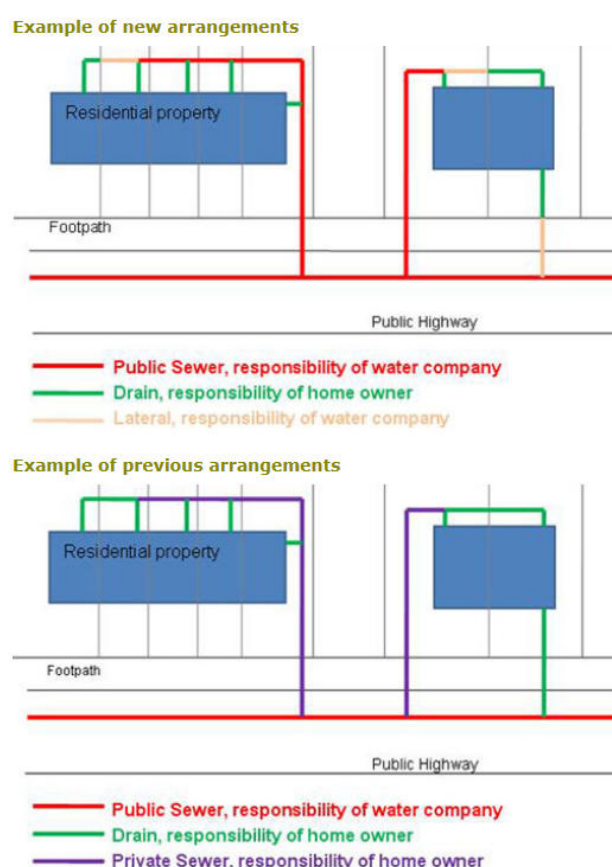


Figure 7.8: The transfer of responsibilities from homeowners to DCWW

7.3.2 Flood Risk Management

Water and sewage companies have the following responsibilities around flood risk management:

- Respond to flooding incidents involving their assets;
- Produce reports of the flood incidents;
- Maintenance of a register of properties at risk of flooding due to a hydraulic overload in the sewerage network (DG5 register);

- Undertake capacity improvements to alleviate sewer flooding problems on the DG5 register;
- Provide, maintain and operate systems of public sewers and works for the purpose of effectually draining an area;
- May be subject to scrutiny from local flood authorities' democratic processes;
- Have a duty for the adoption of private sewers; and
- Statutory consultee to the SAB (when enforced) when the drainage system is proposed to communicate with the public sewer.

7.3.3 Reducing Sewer Flooding

DCWW is responsible for flooding from their foul and surface water sewers, and from burst water mains.

When sewage escapes from a pipe, through a manhole, drain or by backing up in the toilet this is known as sewage flooding. Sewage flooding can be caused by; blockages in the sewer pipe caused by root growth, a collapse or misuse, or vandalism; equipment failure, for example the pumps at a pumping station not operating due to electrical or other problems; and when the sewer is overloaded either because it is too small to deal with the amount of sewage in it (possibly because of increased development in the area) or during storm conditions when too much rainwater from roads and fields ends up in the sewer. The cause may be some distance away from where the flooding happens.

The majority of flooding is reported into the DCWW call centre on **0800 085 3968** (The lines are open 24 hours a day, 7 days a week). The call centre agent will check that the flooding incident involves their assets. If it does not they will redirect the call if necessary. If assets are identified a job is raised and dispatched to field teams. The advisors will tell you when you can expect the field team to arrive at your property. This will usually be within 3 hours. An initial clean up will be undertaken and they will return later if necessary. Priority is given to frequent internal flooding problems where a cost beneficial and sustainable solution is available.

If flooding is present or evidence of flooding present details will be recorded on the 'DG5 Form' and investigated as appropriate which may lead to recording on the DG5 Register. The DG5 register is a register of properties and areas that have suffered or are likely to suffer flooding from public foul, combined or surface water sewers due to overloading of the sewerage system. Investment in the alleviation of sewer flooding is closely allied to the DG5 register.

7.3.4 System of public sewers and works

An essential flood risk management duty is defined under Section 94 of the Water Industry Act 1991, which states that Water and Sewerage Companies have a duty to provide, maintain and operate systems of public sewers and works for the purpose of effectually draining their area. They also have a duty under the same Act relating to premises for 'domestic sewerage purposes'. In terms of wastewater this is taken to mean the ordinary contents of lavatories and water which has been used for bathing, washing and cooking purposes and for surface water removal from yards and roofs. However, there is no legal duty or responsibility relating to highway drainage, land drainage and watercourses, with the exception that Water and Sewerage Companies can accept highway drainage by agreement with a highway authority.

Currently, foul and surface water drainage from new developments can be connected to public sewers²⁷ and Water and Sewerage Company has no powers to prevent new connections to its network even if it believes it could cause flooding to customers. For this reason DCWW comments on planning applications even though they are not a statutory consultee.

However, this will be amended once the relevant section²⁸ of the Flood and Water Management Act is commenced, when the connection to a public sewer will be permitted only after the drainage strategy associated with a new development is approved by the SuDS Approving Body (to which the DCWW will be a statutory consultee). This will only apply to surface water; the 'right to connect' will still apply to foul water.

7.3.5 Reservoir Undertaker

DCWW owns many reservoirs in Wales and as such they are responsible for their maintenance as a reservoir undertaker. They will also be affected by the change to the Reservoirs Act 1975 which has been amended to state the following; all undertakers with reservoirs over 10,000 m³ (above the natural level of the surrounding land) must register their reservoirs with the Environment Agency as they are subject to regulation and all undertakers must report any flood incidents.

²⁷ Section 106 of the Water Industry Act

²⁸ Section 16 of Schedule 3, Flood & Water Management Act 2010

7.4 Conwy County Borough Council Environment, Roads and Facilities Service Department



Conwy County Borough Council Environment, Roads and Facilities Service Department is responsible for the network of non-trunk roads in Conwy County. The Welsh Government is responsible for trunk roads and motorways in Wales which are maintained by the North and Mid Wales Trunk Road Agency (NMWTRA) in Conwy on behalf of the Welsh Government.

All Highways Authorities are Risk Management Authorities according to the FWMA and must adhere to all the responsibilities imposed on risk management authorities; a duty to co-operate with other risk management authorities and authority to take on Flood & Coastal Erosion Risk Management functions from another risk management authority when agreed by both sides.

In addition to their responsibility as a risk management authority, highways authorities also have further responsibilities which are detailed under the following headings:

7.4.1 Responsibility to maintain the Highways

Under the Highways Act, the Highways Authority has a duty to maintain the highway. This includes ensuring that highway drainage systems are clear and that blockages on the highway are cleared, where reasonably practicable. As part of this duty, roads are regularly inspected and maintained.

7.4.2 Adoption of SuDS

Highways Authorities currently have the power to adopt SuDS that serve the highway through Section 38 of the Highways Act but are under no obligation to do so. Under the Flood and Water Management Act, Highways Authorities will be required to adopt any SuDS approved by the SuDS Approval Body which exist within the highways boundary.

7.4.3 Powers to deliver works

The Highway Authority can deliver works that they consider necessary to protect the highway from flooding. These can be on the highway or on land which has been acquired by the highway authority in the exercise of highway and acquisition powers for that purpose. Highway Authorities may divert parts of a watercourse or carry out any other works on any form of watercourse if it is necessary for the construction, improvement or alteration of the highway or provides a new means of access to any premises from a highway.

7.4.4 Response in an Emergency Flooding Event

In the event of an emergency or major incident Conwy's Highways Authority will aim to provide:

- The means to transport people through it's contacts with local bus, coach and taxi operators and the in house fleet to assist with evacuations and helping uninjured survivors at the scene of a major incident to travel home or to a place of safety;

- Assistance in management of the transportation network to restore the flow of traffic in the event of an evacuation or away from the area of an incident. This includes providing equipment such as barriers, cones and signs and setting up and marking route diversions (service provided by Works Contractors in conjunction with the Police) and changing traffic signal controls to improve the flow of traffic; and
- Use of the Conwy Traffic Control Centre facilities and established media contacts to keep staff and the public across the County informed on travel related matters plus detection systems to enable management of traffic on the road network. The means to inspect repair or clear the highway network through the provision of staff, materials and equipment sourced through contractors.

7.5 North and Mid Wales Trunk Road Agency on behalf of the Welsh Government



Trunk roads in Conwy are maintained by the North and Mid Wales Trunk Road Agency (NMWTRA) on behalf of the Welsh Government. The Trunk Road network in North and Mid-Wales consists of approximately 1175 km (730 miles) of trunk road covering 8 Welsh Local Authorities – Ceredigion, Conwy, Denbighshire, Flintshire, Gwynedd, Isle of Anglesey, Powys and Wrexham. NMWTRA must ensure that:

- Road projects do not increase flood risk; and
- Road discharges do not pollute receiving water bodies²⁹.



Figure 7.9: The map shows the full extent of the NMWTRA

The NMWTRA have responsibility for the drainage on the following trunk roads in Conwy County:

- A55 from Llanfairfechan to Bodelwyddan
- A5 from Pont Pen – y – benglog to Maerdy
- A470 from Llandudno Junction to Rhiwbryfdir

²⁹ <http://www.highways.gov.uk/knowledge/18542.aspx>

7.6 Powers and Responsibilities of Conwy's Citizens (Businesses, Landowners and Local Households)

7.6.1 Property Owners and Residents

It is the responsibility of householders and businesses to protect their property from flooding.

While in some circumstances organisations or property owners may be liable due to neglect of their own responsibilities, there will be many occasions when flooding occurs despite all parties meeting their responsibilities. Consequently it is important that householders, whose homes are at risk of flooding, take steps to ensure that their house is protected. There are a number of measures which can be taken to make your property more resistant (stop water entering) and resilient (better prepared to recover) to flooding. These include:

- Check whether your household is at risk from flooding from the river, coast or local flood sources. All households in Flood Zones C1 and C2 (areas at risk from coastal or main river flooding) should have been contacted notifying them of this and, unless they have chosen to opt-out; will receive flood warnings from the EAW when the risk of river or coastal flooding is high. Go to Flood Map at <http://www.environment-agency.gov.uk>;
- Ensure that preparations have been made for the event of a flood. These include registering for the EA Floodline Warnings Direct service if flooding from rivers may be involved, keeping a 'grab bag' of essential items ready and having a plan to turn off electricity, gas and water supplies;
- Take resistant measures to ensure that your house is protected from flooding, either through permanent measures such as sealants in the wall or temporary measures such as floodsax or flood guards. See the National Flood Forum's independent Blue Pages directory: <http://www.bluepages.org.uk/>;
- The combined effect of many people paving over their front gardens can increase the amount of surface runoff which adds to the risk of flooding. See the 'Guidance on the permeable surfacing of front gardens' leaflet: <http://www.communities.gov.uk/publications/planningandbuilding/pavingfrontgardens>;
- Take measures to make sure the house is resilient to flooding so that if it does occur it does not cause too much damage;
- Where possible, take out flood insurance;
- If your property is served by separate surface water and foul sewers, you have a responsibility to fix any pipes which may be wrongly connected. For example, dirty water from sinks, baths, showers, appliances and the toilet should go to the foul sewer to be treated, otherwise watercourses can be polluted. Gutters and gulleys collecting rainwater should connect to the surface water sewer – if these are wrongly connected to the foul sewer then flooding from the foul sewer can result. See the leaflet 'Is your home connected right';

<http://www.environment-agency.gov.uk/homeandleisure/pollution/water/31424.aspx>;

- If you own land adjoining a watercourse then you are a riparian owner and you have a responsibility to pass on flow without obstruction or pollution, including maintaining the banks of the channel and any vegetation so they remain clear of debris; and
- Report a flood incident at floods@conwy.gov.uk to help build evidence for action to be taken.

The Environment Agency provides information on what to do to prepare a household for emergencies. This includes how to make a flood plan which will help you decide what practical actions to take before and after a flood. As detailed in the following link:

<http://www.environment-agency.gov.uk/homeandleisure/floods/31624.aspx>

The National Flood Forum is a national charity dedicated to supporting and representing communities and individuals at risk of flooding. As detailed in the following link; <http://nationalfloodforum.org.uk/>

The National Flood Forum has several roles:

- Help people to prepare for flooding in order to prevent it or mitigate its impacts;
- Help people to recover their lives once they have been flooded; and
- Campaign on behalf of flood risk communities and working with government and agencies to ensure that they develop a community perspective.

7.6.2 Riparian Ownership

Landowners, householders and businesses whose property is adjacent to a river or stream or ditch are likely to be riparian owners with responsibilities. The riparian owner is likely to own the land up to the centre of the watercourse which can be confirmed by The Land Registry.

Riparian owners have a right to protect their property from flooding and erosion but in most case will need to discuss the method of doing this with the Environment Agency. They also have responsibility for maintaining the bed and banks of the watercourse and ensuring there is no obstruction, diversion or pollution to the flow of the watercourse. Full details can be found in the Environment Agency's document '*Living on the Edge: A guide to your rights and responsibilities of riverside ownership*' found at:

<http://www.environment-agency.gov.uk/homeandleisure/floods/31626.aspx>

Details on riparian rights and responsibilities can also be found on the Conwy County Borough Council website at:

<http://www.conwy.gov.uk/doc.asp?cat=7882&doc=26395>

7.6.3 Utility and Infrastructure Providers

Within Conwy most of the defence assets are the responsibility of CCBC, Network Rail or private land owners. Utility and infrastructure providers such as Network Rail, energy companies and telecommunication companies have a crucial role to play in flood risk management as their assets can be important consideration in planning for flooding.

Moreover they may have assets such as culverts, information about which needs to be shared with flood risk management authorities. They already maintain plans for the future development and maintenance of the services they provide and it is important that they factor in flood risk management issues into this planning process. This will ensure that their assets and systems are resilient to flood and coastal risks and that the required level of service can be maintained in the event of an incident.

7.6.4 Reservoir Undertaker

Citizens who own or operate a reservoir have ultimate responsibility for the safety and the maintenance as a reservoir undertaker. Under the FWMA; all undertakers with reservoirs over 10,000 m³ must register their reservoirs with the EAW and all undertakers must report any flood incidents. The reservoir owner is responsible for producing on-site emergency plans which detail how reservoir owners will respond to a potential or real reservoir failure. All undertakers must prepare a reservoir flood plan. It is good practice for all reservoirs to have on-site plans and all reservoir owners are recommended to prepare one.

8. Local Outcomes and Measures

The following chapters of this report will set out the primary outcomes for Conwy County Borough Council for managing flood and coastal erosion risk in Conwy over the life of the Local Flood Risk Management Strategy. Potential measures will be proposed to meet these outcomes and research will be done into the possible sources of funding that may be available for the measures to be implemented.

Under the terms of the FWMA one of the requirements of the Local Flood Risk Management Strategy is the stipulation of the costs and benefits of any proposed measures. At this stage in the Strategy process, it is difficult to ascertain and quantify costs and benefits without knowing the exact scope of any required works. Secondly, quantification of benefits is difficult without knowing the accurate extent to which measures are able to reduce flood risk. It is felt that costs and benefits of detailed measures are better placed within the Annual Action Plans and/or Flood Risk Management Plans.

The outcomes should be inline with wider government policy and include a realistic timetable for delivery, which could include phasing over multiple flood risk management strategy cycles. It is important that the process, measures and actions to achieve the outcomes are pragmatic and supported by all departments and both partners and stakeholders. There should be demonstrable links between outcomes and their contribution to tackling local priorities, in areas potentially vulnerable to flooding.

8.1 Conwy County Strategic Outcomes

The outcomes should be in line with the guiding principles of the Welsh Governments National Strategy³⁰ and Local Strategy guidance³¹ and wider government policy. The outcomes will set the vision for how the council and its partners intend to manage local flood risk.

The Local Strategy outcomes should also take into account Conwy's Corporate Plan which sets out the Council's key priorities over the next five years (2012 – 2017). The Corporate Plan has produced outcomes and improvement activities, which have been assigned to ETS to be implemented.

Local Strategy guidance states that high level strategic outcomes should be developed around the reduction of potential adverse consequences of flooding for human health, the environment, cultural heritage, economic activity. By adopting this approach, the outcomes will be consistent with those required under the Flood Risk Regulations 2009 and assist in ensuring that this common approach is maintained across Wales.

It also suggests that the more detailed outcomes provide opportunities for LLFA to capture and record both long and short term outcomes including and therefore not forgetting the work that is already being completed such as routine maintenance.

The EA has suggested that the LLFA should consider outcomes under each of the three key headings; social, economic and environmental.

CCBC's outcomes for managing flood and coastal erosion risk in Conwy County are listed overleaf:

³⁰ National Strategy for Flood and Coastal Erosion Risk Management in Wales, November 2011

³¹ Local Flood Risk Management Strategies, Local Strategy, November 2011

Ten Outcomes for Conwy County Borough Council:

- 1. To improve the understanding of local flood (surface water, groundwater and ordinary watercourses) and coastal risks;**
- 2. Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk;**
- 3. To collaborate with FRMA's, stakeholders and the public to reduce flood and coastal risks, and share data and resources to the greatest benefit**
- 4. To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;**
- 5. To ensure that planning decisions are properly informed by flooding issues and the impact future planning may have on flood risk management and long term developments;**
- 6. Improve and/or maintain the capacity of existing drainage systems by targeted maintenance;**
- 7. Take a sustainable approach to flood risk management balancing economic, environmental and social benefits;**
- 8. Increase approaches that utilise the natural environment;**
- 9. Ensure the development of skills required to implement effective and innovative flood risk management measures; and**
- 10. Identify projects and programmes which are affordable, maximising capital funding from internal and external sources.**

CCBC has undertaken an assessment in the form of a compatibility matrix to make certain that these chosen outcomes fit inline with National Strategy objectives, Local Strategy guidance and EA key headings. The matrix also states which outcomes are long and short term outcomes and can be found in Table 8.1 below:

Conwy Local Flood Risk Management Strategy

| Outcome number | Conwy County Borough Council LFRMS Outcome | Four Overarching National Strategy Objectives | | | | EA Key Headings | | | Long (L) or Short (S) term |
|----------------|---|---|-------------------------------------|---|-------------------------|-----------------|--------|----------|----------------------------|
| | | Reducing consequences | Raising awareness & engaging people | Providing an effective & sustained response | Prioritising investment | Environmental | Social | Economic | |
| 1 | Improve understanding | ✓ | ✓ | | | ✓ | ✓ | | S |
| 2 | Increase awareness & preparedness | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | S |
| 3 | Working together | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | S |
| 4 | Reduce impact and consequences | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | L |
| 5 | Inform planning decisions | ✓ | ✓ | | | ✓ | ✓ | ✓ | S |
| 6 | Improve/ maintain capacity of existing drainage | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | S |
| 7 | Sustainable approach to FRM | ✓ | | | ✓ | ✓ | ✓ | ✓ | L |
| 8 | Approaches that utilise the natural environment | ✓ | | ✓ | | ✓ | ✓ | | S |
| 9 | Development of skills | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | S |
| 10 | Funding sources | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | S |

Table 8.1: Matrix to demonstrate the links between CCBC Local Strategy outcomes, National Strategy objectives, and EA Key Headings

Short term outcome – 0 - 20 years

Long term outcome – 20 - 100 years

8.2 Potential Measures

A measure can be defined as an activity, which will be undertaken to manage risk and achieve the agreed outcomes. Local Strategy guidance states that a wide range of measures should be considered for the short (0-20 years), medium (20-50 years) and longer term (50-100 years). These should include both structural and non-structural activities; examples of these are included in Table 8.2 below:

| Non-structural Measures | Structural Measures |
|---|--|
| <ul style="list-style-type: none"> ■ Flood Warnings Systems; ■ Public awareness and preparedness workshops; ■ Community engagement; and ■ Surface Water Management Plans. | <ul style="list-style-type: none"> ■ Flood walls; ■ Flood embankments; ■ Trash screens; ■ Demountable flood barriers; and ■ Flood storage features. |

Table 8.2: Examples of structural and non-structural activities

Measures which will achieve multiple benefits, such as water quality, biodiversity and amenity benefits are encouraged and should be promoted wherever possible.

The Local Strategy guidance also specifies that all LLFA's should consider measures under the following high level themes:

- Development planning and adaptation (encompassing both new and adaptations to existing developments / landscapes);
- Flood forecasting, warning and response;
- Land, cultural and environmental management;
- Asset management and maintenance;
- Studies assessments and plans;
- High level awareness and engagement (to increase individual and community resilience); and
- Monitoring (of the local flood risk issues).

Where practical and when resources are available, CCBC would like to deliver the following measures for managing flood and coastal erosion risk in Conwy County subject to funding from Welsh Government.

| | |
|--|--|
| 1 | To improve the understanding of local flood (surface water, groundwater and ordinary watercourses) and coastal risks |
| <p>1.1 Record all flooding incidents and where appropriate carry out flooding investigations;</p> <p>1.2 Record all appropriate structures/assets on watercourses so that ownership and responsibility can be identified in the event of a problem with flooding;</p> <p>1.3 Develop a consistent approach to designation of flooding/drainage structures;</p> <p>1.4 Identify and assess the condition of existing drainage assets within the County, to prioritise capital investment;</p> <p>1.5 Develop a standard press statement to be issued following a flood event;</p> <p>1.6 Develop a county wide map based record of flood risk assets, Flood Investigation Reports, historical flooding and areas at risk of flooding to allow a proactive risk management approach to be taken by the flood authority;</p> <p>1.7 Create flood hazard and flood risk maps and flood risk management plans for areas in the county known to be at risk of significant flooding; and</p> <p>1.8 Update the Conwy Flood Risk Assessment.</p> | |
| 2 | Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk |
| <p>2.1 Raise public awareness of the impacts of climate change on flooding and (failure of) coastal defences;</p> <p>2.2 Publish a public awareness strategy (Workshops, public awareness events, update and improve the Council Website, adverts in local press) and communicate it;</p> <p>2.3 Maintain / improve a flood incidents team (on call 24 hour) to deal with non-emergency flood incidents;</p> <p>2.4 To collaborate with statutory bodies to promote the existing flood warning service (EAW) and their proposed flooding campaigns;</p> <p>2.5 Create an integrated county wide real time hydraulic and flood alert map (long term);</p> <p>2.6 Make the public aware of available flood prevention and mitigation measures (resistance and resilience) to protect their property and assets; and</p> <p>2.7 Target areas of historical flooding (or at high probability of flooding) to increase awareness of emergency procedures in the event of a flood.</p> | |

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| 3 | To collaborate with FRMA's, stakeholders and the public to reduce flood and coastal risks, and share data and resources to the greatest benefit |
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| <ul style="list-style-type: none"> 3.1 Identify responsibilities of the riparian owners of managing their assets, through public engagement; 3.2 Continue to meet with the North Wales LFRMA's and Coordination Group to share knowledge, data and lessons learnt; 3.3 Develop an effective communication plan to ensure collaborative working and data sharing; 3.4 Undertake stakeholder engagement, to identify responsibilities of flood risk partners; and 3.5 Introduce a process to carry out internal and external flood debrief meetings following a flood. |
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| 4 | To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion |
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| <ul style="list-style-type: none"> 4.1 Identify vulnerable groups within the community, and prepare action plans in the event of flooding; 4.2 Identify areas at greatest risk of flooding, and develop a capital cost investment programme to alleviate flooding; 4.3 Educate general public on options for protecting their properties through flood prevention options and resistance and resilience measures; 4.4 Assist and provide support following a flood event; and 4.5 Develop site specific flood response plans for at high risk communities. |
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| 5 | To ensure that planning decisions are properly informed by flooding issues and the impact future planning may have on flood risk management and long term developments |
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| <ul style="list-style-type: none"> 5.1 Develop clear guidance for the Planning Department when assessing planning applications; 5.2 Develop a process with the Planning Department to create clear advice and direction to developers on FRMS and drainage (including incorporation of SuDS into new developments); 5.3 Establish a SuDS Approval Body (SAB); 5.4 Keep the Planning Department informed and up-to-date with flood areas in the County; and 5.5 Develop policies for effective land use management and enhance development control procedures where appropriate. |
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| 6 | Improve and/or maintain the capacity of existing drainage systems by targeted maintenance |
| 6.1 | Identify and assess the condition of existing drainage assets within the County, to prioritise capital investment; |
| 6.2 | Develop a risk based reactive and cyclical maintenance regime; and |
| 6.3 | Develop a risk based programme for improving existing infrastructure. |
| 7 | Take a sustainable approach to flood risk management balancing economic, environmental and social benefits |
| 7.1 | Ensure the environmental consequences of implementing the LFRMS are considered against the technical, economic and social benefits; |
| 7.2 | Consider the principles of the Conwy Sustainability Strategy in FCERM; and |
| 7.3 | Consider the use of attenuation through wetlands to increase the length of flow durations, store flood water, and provide amenity and ecological benefits. |
| 8 | Increase approaches that utilise the natural environment |
| 8.1 | Adopt natural flood-risk management techniques including SuDS; |
| 8.2 | Keeping up-to-date with new and innovative technologies for flood defence and flood management; |
| 8.3 | Where possible incorporate multiple benefits such as water quality, biodiversity and amenity benefits; and |
| 8.4 | Continue to implement Conwy's non-culverting statement. |
| 9 | Ensure the development of skills required to implement effective and innovative flood risk management measures |
| 9.1 | Provide appropriate staffing levels and develop staff expertise to deliver the requirements of the act; |
| 9.2 | Invest in appropriate software and hardware; |
| 9.3 | Outsource specialist skills to deliver specific projects, and |
| 9.4 | Collaborate and provide support, training and network of staff across the region. |

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| 10 | Identify projects and programmes which are affordable, maximising capital funding from internal and external sources |
| 10.1 | Identify potential funding sources which may include communities and local business's; |
| 10.2 | Undertake full lifecycle cost benefit analysis for projects including social, and environmental benefits; and |
| 10.3 | Investigate opportunities for match funding and grants. |

CCBC has undertaken an assessment in the form of a compatibility matrix to make certain that these potential measures fit inline with Local Strategy guidance and high level themes. The matrix also states which measures are structural and non-structural and whether they are long, medium and short term and can be found in Table 8.3 on the following page.

Conwy Local Flood Risk Management Strategy

| Measure Reference Number | LFRMS Measures | High Level Themes | | | | | | | Long (L), Medium (M), Short (S) term | Structural (S), Non-structural (NS) | Status - Ongoing (O), Pending (P), Aspirational (A) |
|--------------------------|---|-----------------------------------|---------------------------------------|---|--------------------------------|-----------------------------|-----------------------------------|------------|--------------------------------------|-------------------------------------|---|
| | | Development planning & adaptation | Flood forecasting, warning & response | Land, cultural & environmental management | Asset management & maintenance | Studies, assessment & plans | High level awareness & engagement | Monitoring | | | |
| 1.1 | Record all flooding incidents and where appropriate carry out flooding investigations | - | ✓ | - | ✓ | ✓ | - | ✓ | S | NS | O |
| 1.2 | Record all appropriate structures/assets | - | - | - | ✓ | - | ✓ | ✓ | S | NS | O |
| 1.3 | Consistent approach to designation of structures | - | - | - | ✓ | - | - | - | S | NS | P |
| 1.4 | Identify and assess the condition of drainage assets/structures | - | - | - | ✓ | - | ✓ | - | S | NS | O |
| 1.5 | Issue a press statement | - | ✓ | - | - | - | ✓ | - | S | NS | A |
| 1.6 | County wide flooding and drainage asset model | - | ✓ | - | ✓ | - | ✓ | ✓ | L | NS | A |
| 1.7 | Flood hazard and flood risk maps and flood risk management plans | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | S | NS | A |
| 1.8 | Update the Conwy Flood Risk Assessment | - | - | - | - | ✓ | ✓ | ✓ | S | NS | P |
| 2.1 | Raise public awareness | - | - | - | - | - | ✓ | - | S | NS | O |
| 2.2 | Publish a public awareness strategy and communicate it | - | - | - | - | ✓ | ✓ | - | S | NS | A |
| 2.3 | Maintain / improve a flood incidents team (on call 24 hour) | - | ✓ | - | - | - | - | - | S | NS | O |
| 2.4 | Collaborate with statutory bodies | - | ✓ | - | - | - | ✓ | - | S | NS | A |
| 2.5 | Integrated county wide real time hydraulic and flood alert map | - | ✓ | - | ✓ | ✓ | - | - | M | NS / S | A |
| 2.6 | Public awareness of available flood prevention and mitigation | ✓ | - | ✓ | - | - | ✓ | - | S | NS | O |

Conwy Local Flood Risk Management Strategy

| Measure Reference Number | LFRMS Measures | High Level Themes | | | | | | | Long (L), Medium (M), Short (S) term | Structural (S), Non-structural (NS) | Status - Ongoing (O), Pending (P), Aspirational (A) |
|--------------------------|--|-----------------------------------|---------------------------------------|---|--------------------------------|-----------------------------|-----------------------------------|------------|--------------------------------------|-------------------------------------|---|
| | | Development planning & adaptation | Flood forecasting, warning & response | Land, cultural & environmental management | Asset management & maintenance | Studies, assessment & plans | High level awareness & engagement | Monitoring | | | |
| | measures | | | | | | | | | | |
| 2.7 | Target areas of historical flooding | - | - | - | - | - | ✓ | - | S | NS | A |
| 3.1 | Identify responsibilities of the riparian owners | - | - | ✓ | ✓ | - | ✓ | - | S | NS | P |
| 3.2 | Continue to meet with North Wales LFRMA's & Coordination Group | - | ✓ | - | - | - | ✓ | - | S | NS | O |
| 3.3 | Effective communication plan | - | - | - | - | ✓ | ✓ | - | S | NS | A |
| 3.4 | Stakeholder engagement, to identify responsibilities of flood risk partners | - | - | - | - | - | ✓ | - | S | NS | O |
| 3.5 | Internal and external debrief meetings following a flood | ✓ | ✓ | - | ✓ | - | ✓ | - | S | NS | O |
| 4.1 | Identify vulnerable groups & prepare action plans | - | - | - | - | ✓ | - | - | S | NS | A |
| 4.2 | Identify areas at greatest risk of flooding, develop capital cost investment programme | ✓ | - | - | - | ✓ | - | - | S | NS | A |
| 4.3 | Educate general public on options for protecting their properties | ✓ | - | ✓ | - | - | ✓ | - | S | NS | O |
| 4.4 | Assist and provide support following a flood event | - | ✓ | - | - | - | - | - | S | NS | A |
| 4.5 | Develop site specific flood response plans | ✓ | ✓ | - | - | ✓ | ✓ | - | S | NS | O |
| 5.1 | Guidance for Planning Department | ✓ | - | ✓ | - | ✓ | - | - | S | NS | A |

Conwy Local Flood Risk Management Strategy

| Measure Reference Number | LFRMS Measures | High Level Themes | | | | | | | Long (L), Medium (M), Short (S) term | Structural (S), Non-structural (NS) | Status - Ongoing (O), Pending (P), Aspirational (A) |
|--------------------------|---|-----------------------------------|---------------------------------------|---|--------------------------------|-----------------------------|-----------------------------------|------------|--------------------------------------|-------------------------------------|---|
| | | Development planning & adaptation | Flood forecasting, warning & response | Land, cultural & environmental management | Asset management & maintenance | Studies, assessment & plans | High level awareness & engagement | Monitoring | | | |
| 5.2 | Process to create clear advise and direction to developers | ✓ | - | ✓ | - | ✓ | - | - | S | NS | A |
| 5.3 | Establish a SuDS Approval Body | ✓ | - | ✓ | - | - | - | - | S | NS | P |
| 5.4 | Keep the Planning Department informed and up-to-date with flood areas | ✓ | - | - | - | - | - | ✓ | S | NS | A |
| 5.5 | Policies for effective land use management | ✓ | - | ✓ | - | ✓ | - | - | S | NS | A |
| 6.1 | Identify and assess condition of existing drainage assets | - | - | - | ✓ | ✓ | - | - | S | NS | O |
| 6.2 | Risk based reactive and cyclical maintenance regime | - | - | - | ✓ | ✓ | - | - | S | NS | O |
| 6.3 | Risk based programme for improving existing infrastructure | - | - | ✓ | ✓ | ✓ | - | - | S | NS | A |
| 7.1 | Consequences of implementing LFRMS considered | - | - | ✓ | - | - | - | - | S | NS | O |
| 7.2 | Work towards CCBC Sustainability Strategy | ✓ | - | ✓ | - | - | ✓ | - | S | NS | O |
| 7.3 | Consider using wetlands | - | - | ✓ | - | - | - | - | S | NS | A |
| 8.1 | Adopt natural flood-risk management including SuDS | ✓ | - | ✓ | - | - | - | - | S | NS / S | P |
| 8.2 | Keeping up-to-date with new and innovative technologies | - | - | - | - | - | ✓ | - | M | NS | A |
| 8.3 | Where possible incorporate multiple benefits | ✓ | - | ✓ | - | - | - | - | S | NS / S | A |
| 8.4 | Implement Conwy's non-culverting statement | ✓ | - | ✓ | - | - | - | - | S | NS | O |

Conwy Local Flood Risk Management Strategy

| Measure Reference Number | LFRMS Measures | High Level Themes | | | | | | | Long (L), Medium (M), Short (S) term | Structural (S), Non-structural (NS) | Status - Ongoing (O), Pending (P), Aspirational (A) |
|--------------------------|---|-----------------------------------|---------------------------------------|---|--------------------------------|-----------------------------|-----------------------------------|------------|--------------------------------------|-------------------------------------|---|
| | | Development planning & adaptation | Flood forecasting, warning & response | Land, cultural & environmental management | Asset management & maintenance | Studies, assessment & plans | High level awareness & engagement | Monitoring | | | |
| 9.1 | Provide enough staff to deliver the requirements of the act | - | - | - | - | - | - | - | S | NS | O |
| 9.2 | Invest in appropriate software and hardware | - | ✓ | - | - | - | - | - | S | NS | O |
| 9.3 | Outsource specialist skills to deliver specific projects | - | - | - | - | - | - | - | S | NS | O |
| 9.4 | Staff support, training and networks | - | - | - | - | - | ✓ | - | S | NS | A |
| 10.1 | Identify potential funding sources | - | - | - | - | - | - | - | S | NS | O |
| 10.2 | Lifecycle cost benefit analysis | - | - | ✓ | - | ✓ | - | - | S | NS | O |
| 10.3 | Investigate opportunities for match funding and grants | - | - | - | - | - | - | - | S | NS | O |

Table 8.3: Matrix to demonstrate the links between CCBC Local Strategy measures and Local Strategy Guidance, and high level themes

✓ = Measure supports the theme
 - = Measure is not applicable to the theme

- Short Term measure – 0 - 20 years
- Medium Term measure – 20 - 50 years
- Long Term measure – 50 - 100 years

- Ongoing – Measures that are already currently carried out by CCBC and will continue
- Pending – Measures that CCBC are required to do under the FWMA
- Aspirational – Measures that are not required but would be beneficial to implement

8.3 Adopt Natural Flood Risk Management Techniques

The EA has produced the first national report of how natural processes can help manage flood risk in England and Wales; ‘Greater working with natural processes in flood and coastal erosion risk management, January 2012’ which is in response to the Pitt Review recommendation 27³². The definition of ‘working with natural processes’ taken from this report is shown below:

‘Working with natural processes means taking action to manage flood and coastal erosion risk by protecting, restoring and emulating the natural regulating function of catchments, rivers, floodplains and coasts. This could, for example, involve using farmland to temporarily store flood water, re-instating washlands and wetlands to store flood water away from high risk areas or allowing cliffs to erode to provide sediment down drift.’

In the context of FCERM, working with natural processes often means slowing down the flow of water (e.g. by re-establishing flood plains that hold flood waters) or speeding up the flow of water (e.g. by removing unnatural obstructions), to prevent flood waters from causing harm. Such techniques protect, restore or emulate natural processes which regulate flooding and erosion and, in doing so, may provide other ecosystem benefits such as biodiversity, carbon storage, and improved water quality. Natural processes operate across a continuum from mitigated engineering to full naturalisation (see Figure 8.1 below).

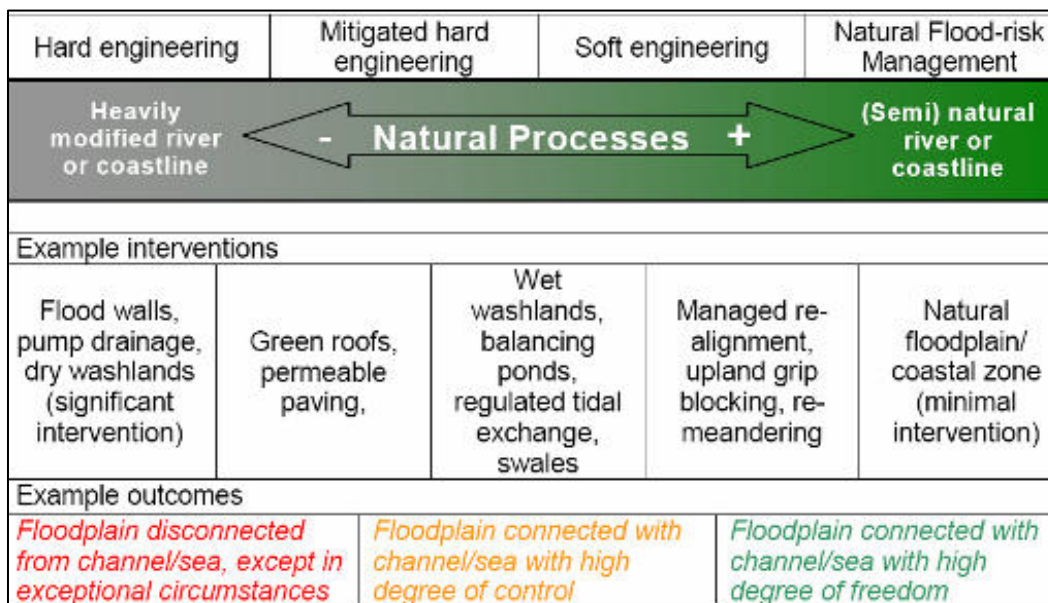


Figure 8.1: The Environment Agency’ conceptual model of working with natural processes.

Sustainable Drainage Systems (SuDS) reduce flood risk both at a development site and elsewhere in the catchment by replicating natural drainage processes. There are numerous varieties including detention basins (dry), retention ponds (wet), grassed swales, porous pavements, soakaways and 'green' roofs that

³² “Defra, the Environment Agency and Natural England should work with partners to establish a programme through Catchment Flood Management Plans and Shoreline Management Plans to achieve greater working with natural processes”

store water within a building's own footprint. These interventions slow down and absorb surface water runoff and can create valuable habitats for wildlife while reducing flood risk to developments.

CASE STUDY to illustrate a technique of working with natural processes for FCERM:

Floodplain reconnection, Conwy Valley Flood Alleviation Scheme, North Wales

The village of Llanrwst in the Conwy valley has suffered from significant flooding from the River Conwy over the last decade, notably in 2004 and 2005. In the past flood flow across the floodplains has been halted by an embankment known as White Barn (south), which causes water to back up until the right bank spills out into the historic centre of Llanrwst. Also, the White Barn (south) embankment failed in one place and flood water crossed the floodplain and flooded part of a small settlement (Trefriw) which lowered flood levels in Llanrwst.

By lowering the White Barn (south) embankment flood water will overtop the structure in a controlled manner at a level which will help reduce flood levels in Llanrwst. Some defences will still be need in Llanrwst but these can be lower than would otherwise be the case and the design will enable more use of demountable structures. Trefriw would be offered protection by a new flood bank. By lowering White Barn (south) this will allow the reconnection and utilisation of the floodplain. Current modelling shows that the flood bank once lowered will overtop around five times per year.

The scheme also created a wetland by excavating borrow pits for material for the embankment around Trefriw.



White Barn (south) embankment prior to lowering. The River Conwy is to the left of the embankment which currently protects the farmland to the right from flooding. Post scheme this farmland will be expected to flood approximately five times a year

9. Funding and Delivery

9.1 Funding Requirements

Some of the measures outlined in the previous section have been core activities for the council for a number of years and processes are in place to deliver those measures. Other measures, however, relate to the new responsibilities which have recently been assigned, most of which requiring a new set of skills, experience, processes and software that may take some time to develop or acquire.

It is important that the Local Strategy sets out where the funding will come from to acquire these resources in order to implement the measures within the strategy. Some measures will be delivered with existing council resources but others will require external funding support. Conwy County Borough Council must identify what funding sources are currently available to them and what actions will need to be taken to ensure that alternative funding is achievable.

Currently most funding for flooding and coastal erosion comes from Welsh Government in the form of the Revenue Support Grant (RSG). It is essential for the implementation of this Strategy and for all statutory duties mentioned that the funding settlement from Welsh Government to CCBC identifies an allocation to Flood Risk Management. The statutory duties outlined previously, will require ongoing funding from the Conwy County Borough Council's RSG from 2013 onwards to ensure that there are sufficient resources to implement the strategy and;

- The proposed measures of the Strategy;
- Collect data for the revision of the PFRA in 2016 and every 6 years;
- Maintain and update the asset register;
- Designation of structures and features that affect flood or coastal erosion risk;
- Continue and improve the investigation of floods;
- Continue consenting works in ordinary watercourses;
- When the FWMA is fully implemented; checking, inspecting, approving, adopting and maintaining SuDS schemes as part of the SAB role;
- Implementation, monitoring, reviewing and updating the Local Strategy every 6 years; and
- Community awareness activities associated with duties of the Local Strategy.

9.2 Current Funding Sources

At present Conwy County Borough Council receives funding from Welsh Government in two ways:

- A non-hypothecated grant (which can be used by the authorities for any purpose they choose in delivering the services for which they are responsible); An annual and unpredictable amount is provided through the Revenue Support Grant (RSG); and

Conwy Local Flood Risk Management Strategy

- A hypothecated grant (which can only be used for the specific purposes for which they are provided); Flood Defence Grant-in-Aid (FDGiA) provided by bidding for Flood Alleviation Grants (FAG), on a scheme by scheme basis, under the Land Drainage Act 1991. Currently the FAG rate (money contributed from WG) for fluvial schemes is 85% and for coastal schemes its 65%. Conwy County Borough Council contributes the remainder to the scheme.

| Source of Funding | Description | Indicative budget in 2012/2013 | Administered By | To Fund |
|---|---|--------------------------------|------------------------------|--|
| FCERM Revenue Support Grant (RSG) | For the 2013 / 2014 financial year onwards funding to support each LLFA will be provided through the Revenue Support Grant (RSG) system. | £90+ Thousand | Conwy County Borough Council | LLFA duties under the FWMA. Maintenance of ordinary watercourses and related assets. Maintenance of coastal erosion mitigation measures. |
| Flood Defence Grant-in-Aid (FDGiA) | Welsh government funding for Flood alleviation grants (FAG) on a scheme by scheme basis – recently revised to encourage a partnership approach to maximise match-funding, work towards achieving specified objectives with a requirement to evidence a reduction in flood risk to properties | Unknown | Welsh Government | Medium to large capital FRM projects. FRM and coastal erosion management studies, strategies and projects. |
| Private Contributions | Voluntary from the private sector and local communities. Funding from beneficiaries of projects could make contributions from national funding viable. Contributions could be financial or “in kind” e.g. land, volunteer labour | Unknown | Conwy County Borough Council | All projects |
| Water Company Investment | Investment heavily regulated by Ofwat but opportunities for contributions to area-wide projects which help to address sewer under-capacity problems | Unknown | DCWW | Projects which help to remove surface water from combined sewers |
| SAB Income | It is anticipated that Conwy will receive application and inspection fees funded by developers in support of the approval and inspection of new development related SuDS. Funding of long-term maintenance of SuDS is currently unclear; although a range of solutions is available including payment of commuted sums by | Unknown | Conwy County Borough Council | Development drainage approval and FRM issues |

Conwy Local Flood Risk Management Strategy

| Source of Funding | Description | Indicative budget in 2012/2013 | Administered By | To Fund |
|---|--|--------------------------------|------------------------------|---|
| | Developers. The long-term funding of maintenance is to form part of the Consultation with Welsh Government. | | | |
| Flood and Coastal Resilience Partnership Funding | Some funding allocated for major capital projects require contributions into resilience measures. | Unknown | Conwy County Borough Council | measures which address flood risk to communities and businesses |
| European Convergence Funding 2007 - 2013 | The Convergence programme for West Wales and the Valleys comprise funding from two separate European Structural Funds: the European Regional Development Fund (ERDF) and the European Social Fund (ESF). The Colwyn Bay Waterfront project received £2.5m from ERDF for coastal defence. The other £3m for coastal defence is from WG. £8.4m of regeneration funding is 50% WG and 50% ERDF. | £2 million | Conwy County Borough Council | Medium to large capital FRM projects |
| Local Fundraising | An important funding mechanism will come from local fundraising from the local communities and businesses that benefit from the proposed flood defence schemes. | Unknown | Conwy County Borough Council | measures which address flood risk to communities and businesses |
| Riparian owners | Maintenance and repair of assets is normally the responsibility of riparian owners, awareness raising will assist in ensuring that assets are maintained; however, historic assets with uncertain ownership may require assistance in funding repairs or end of life replacement. | Unknown | Conwy County Borough Council | measures which address flood risk to riparian owners |

Table 9.1: CCBC's current funding sources for FCERM

9.3 Other Possible Funding Sources for the Future

| Source of Funding | Description | Indicative budget in 2012/2013 | Administered By | To Fund |
|---|---|-----------------------------------|------------------------------|---|
| Coastal Communities Fund (delivered on behalf of the government by the Big Lottery Fund) | The fund is available to Local Authorities in managing and adapting to flood and coastal erosion risk, and managing pollution risks associated with the coast, where this supports local economic development. The Fund opened for bids in March 2012 but is intended to be a rolling fund with annual bidding rounds. It is expected that there will be at least two future years of funding commencing in 2013 and 2014. The Coastal Communities Fund will open again for applications in early 2013. | £1.45 million available for Wales | Big Fund | Projects that help coastal communities to better enable them to use their assets (physical, natural, social, economic and cultural) to promote sustainable economic growth and jobs |
| Section 106 contributions (Town & Country Planning Act) | It is anticipated that Conwy will receive contributions from developers linked to specific development sites where off-site improvements to drainage infrastructure are required to make the developers proposals acceptable e.g. Green infrastructure with multiple benefits where there will be opportunities for Community groups to manage certain areas. | Unknown | Conwy County Borough Council | Larger development sites |
| Community Infrastructure Levy (CIL) | A local levy applied by the Planning Authority on developers. It allows local authorities to raise funds from new development in the area in order to pay for the impact that the development has on local infrastructure. The levy is based on the concept that almost all development has some impact on infrastructure and services, so it is fair that development should contribute towards the cost of maintaining or upgrading local infrastructure. Conwy County Borough Council has not yet implemented a CIL scheme. A bid for CIL would have to be made for flood management/drainage improvements against other competing council | Unknown | Conwy County Borough Council | All measures outlined in the Strategy |

Conwy Local Flood Risk Management Strategy

| Source of Funding | Description | Indicative budget in 2012/2013 | Administered By | To Fund |
|--|--|--------------------------------|--|---|
| | priorities. | | | |
| Business Rates Supplements | Agreement from local businesses to raise rates for specified purposes. | Unknown | Conwy County Borough Council | measures which address flood risk to businesses |
| Collaborative schemes with other RMA's | There are opportunities for collaborative schemes with other RMAs, although the Water Authority has limited scope for allocating funding to schemes outside their capital programme which is usually set several years' in advance; however early discussions and involvement may benefit all parties and the Community. | Unknown | Conwy County Borough Council | Key measures in the Strategy |
| Interreg Programmes 2013 - 2020 | Interreg Wales Ireland Programme Interreg North West Europe Interreg Atlantic Area To work in partnership with other counties on initiatives involving research, monitoring, awareness raising, developing tools and strategies in flood and coastal erosion. | Unknown | Conwy County Borough Council European Section | Revenue based projects |
| LIFE Programme 2013 – 2020 | LIFE Environmental Policy and Governance. To bridge the gap between research and development results and widespread implementation. Information, communication and awareness raising campaigns. | Unknown | Conwy County Borough Council European Section | Initiatives that are looking to move from R&D to implementation |
| Structural Funds Programmes 2013 - 2020 | Structural Funds – potentially around climate change adaptation, risk prevention and management. | Unknown | Conwy County Borough Council European Section | Potentially medium to large capital projects |
| Defra | Other funding is being provided by Defra to help some individual homeowners to pay for the cost of installing individual property flood resilience measures in areas that are frequently flooded and do not benefit from community defences. The funding is being administered through | Unknown | Conwy County Borough Council | Installing individual property flood resilience measures |

Conwy Local Flood Risk Management Strategy

| Source of Funding | Description | Indicative budget in 2012/2013 | Administered By | To Fund |
|-------------------|--|--------------------------------|-----------------|---------|
| | the local authorities, reimbursed by the EA. Defra are also funding work to understand and manage the risk from surface water and ground and groundwater flooding. | | | |

Table 9.2: CCBC's possible future funding sources for FCERM

10. Contribution to Wider Environmental Objectives

The main purpose of this report is to set out the strategy for implementing flood risk management measures across Conwy. However there is an opportunity to derive significant benefit in the process, in respect to county and country-wide aspirations in the wider context of sustainability, environmental and social improvement. The aim is to provide better environments for residents and businesses as well as improving biodiversity and local habitats for wildlife.

Delivering multiple benefits will require working with partners to identify local priorities and opportunities. Where appropriate, and in line with the principles of the National Strategy, contributions that help to deliver these additional improvements could be sought from those partners that benefit. Higher levels of government funding may also be accessible when wider benefits are delivered as part of the Local Strategy.

The environmental objectives and measures that the Local Strategy will contribute to through the effective management of local flood risk are included below, some of which include Local Strategy outcomes and national environmental objectives:

- To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;
- To ensure that planning decisions are properly informed by flooding issues and the impact future planning may have on flood risk management and long term developments;
- Improve and/or maintain the capacity of existing drainage systems by targeted maintenance;
- Establish a SuDS Approval Body (SAB);
- The Conwy SAB will embrace Welsh Government guidance on the encouragement, adoption and maintenance of SuDS. SuDS are an opportunity to ensure that amenity and biodiversity are considered with the same importance as managing volumes of water;
- Take a sustainable approach to flood risks management balancing economic, environmental and social benefits;
- Water Framework Directive targets (under Article 4.1) which are relevant to this Local Flood Risk Management Strategy include;
 - Ensure no deterioration of surface water and groundwater and the protection of all water bodies (including coastal waters);
 - Achieve 'good' ecological status by 2015 for surface water and groundwater;
 - Reduction of pollution and hazardous substances in surface water and groundwater;
 - Reverse any upwards trends of pollutants in groundwater; and
 - Achieve standards and objectives set for protected areas.
- Adopt a holistic approach to drainage solutions;
- Enhance biodiversity and habitat creation within any future capital schemes. These schemes can also be used within urban areas to provide green spaces for amenity;

- Adaptation to climate change through local flood risk management measures, in order to build in community and operational resilience;
- Protect Sites of Special Scientific Interest (SSSIs) within Conwy. All flood risk management authorities have a duty (under Section 28G of the Wildlife and Countryside Act 1981) to take reasonable steps to further the conservation and enhancement of SSSIs;
- Ensure no loss or degradation of habitat through flood risk management works to comply with the Biodiversity Action Plan (BAP). As a flood authority, Conwy County Borough Council has a duty (under Section 40(1) of the Natural Environment and Rural Communities Act 2006) to conserve biodiversity within Conwy;
- Ensure the environmental consequences of implementing the LFRMS are considered against technical, economic and social benefits; and
- The strategy has undergone a thorough assessment against the Strategic Environmental Assessment (SEA) and the Habitats Regulations (HRA).

10.1 The Water Framework Directive

The Water Framework Directive (WFD) is the most substantial piece of EC water legislation to date and is designed to improve and integrate the way water bodies are managed throughout Europe. It came into force on 22 December 2000 and was transposed into UK law in 2003 via the Water Environment (Water Framework Directives) (England and Wales) Regulations 2003/61. Member States must aim to reach good chemical and ecological status in inland and coastal waters by 2015. It is designed to:

- Prevent deterioration in the classification status of aquatic ecosystems, protect them and improve the ecological condition of waters;
- Aim to achieve at least good status for all waters. Where this is not possible, good status should be achieved by 2021 or 2027;
- Promote sustainable use of water as a natural resource;
- Conserve habitats and species that depend directly on water;
- Progressively reduce or phase out releases of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
- Contribute to mitigating the effects of floods and droughts.

The Water Framework Directive establishes new and better ways of protecting and improving rivers, lakes, groundwater, transitional (where freshwater and sea water mix) and coastal waters. In order to achieve this, in 2009 the Environment Agency Wales produced three River Basin Management Plans in Wales setting out measures to protect and improve the water environment. These are currently being implemented and will be revisited in 2015, 2021 and 2027, to ensure that the water body status does not deteriorate from standards set in 2009 as part of the initial River Basin Management Plans. It is important

that measures to manage local flood risk do not cause deterioration of water bodies and should consider opportunities to improve water bodies in conjunction with local flood risk management.

10.2 Sustainable Development

10.2.1 One Wales: One Planet

The Welsh Government has a duty to have a 'Scheme for Sustainable Development', setting out how it will promote sustainable development. The current Scheme, One Wales: One Planet³³ was launched in May 2009 and defines sustainable development as:

"Enhancing the economic, social and environmental wellbeing of people and communities, achieving a better quality of life for our own and future generations in ways which:

- 1. Promote social justice and equality of opportunity; and*
- 2. Enhance the natural and cultural environment and respect its limits - using only our fair share of the earth's resources and sustaining our cultural legacy."*

'One Wales One Planet' says that if every country in the world used as much resources as our own small country, we would need three planets worth of trees, of crops, of oil and so on to survive, and this is increasing. Obviously we can't go on like this and although we are making progress in Conwy, there is still more to do.

CCBC has always been committed to leading the way in protecting our environment. Providing weekly recycling collections and reducing landfill; cleaning our streets to a high standard, such that we have been the cleanest county in Wales 3 years running; improving the coastal defences in Colwyn Bay to protect communities and natural habitats from the impacts of climate change; and improving the quality of our parks, green spaces and beaches are just some of the things we are doing to improve the quality of our environment and make life better for the people that live in and visit Conwy County.

10.2.2 Guidance to Risk Management Authorities

As required under the Flood and Water Management Act, Welsh Government has published guidance to explain how sustainable development should be applied to flood risk management; *'Sustainable Development: Guidance to Risk Management Authorities Section 27 – Sustainable Development'*.

The guidance states that sustainable development is highly applicable to the Flood and Coastal Erosion Risk Management and requires an approach which delivers four objectives:

- Maximises the long-term economic, social and environmental wellbeing of people and communities in Wales, whilst living within environmental limits;
- Safeguards the continued provision of ecosystem services from our natural environment;
- Avoids exposing current and future generation to increasing risk; and

³³ One Wales : One Planet. The Sustainable Development Scheme of the Welsh Assembly Government, May 2009, <http://wales.gov.uk/topics/sustainabledevelopment/publications/onewalesoneplanet/?lang=en>

- Improves the resilience of communities, the economy and the natural, historic, and social environment to current and future risk.

Suggestions of how CCBC can contribute to sustainable development which includes delivering these objectives can be found within the next section.

10.2.3 Conwy Sustainability Strategy

Conwy has also produced a strategy for sustainability³⁴ which sets out its main vision for sustainable development:

“We will work to provide healthy, prosperous and protected environments for existing and future generations”.

In order to achieve this, the strategy sets out the principles that Conwy County Borough Council have adopted. It is essential that as a Lead Local Flood Authority we aim to work towards these principles as well as the objectives in the WG guidance. The principles of the Conwy Sustainability Strategy and ways in which the LLFA can achieve them are included below:

- **We will consume less natural resources;**

We can promote the use of rainwater harvesting, reducing flow to sewers and reducing potable water consumption.

Promote rain gardens that serve to attenuate rainwater and provide irrigation of vegetation.

- **We will reduce our carbon emissions;**

We can reduce emissions by reducing energy use and increase energy efficiency by; minimising surface water pumping, reduce the amount of surface water entering combined sewers which needs water treatment.

Reduce embedded carbon in soft engineered flood risk reduction measures.

Increase the use of wetlands for flood management which also act as areas of carbon capture.

- **We will support the local economy;**

We will avoid the need for large scale works, through proactive maintenance of existing infrastructure by local staff and contractors.

Preferentially use locally-provided goods and services in so far as this is consistent with procurement law.

Seek to reduce product miles when sourcing goods and services.

Using sustainable, local low carbon and/or renewable energy supplies.

Seek opportunities to include social clauses through FCERM procurement, to reduce inequalities and support less well-off communities.

- **We will ensure our built environment is safe and accessible;**

We will ensure that competent contractors are appointed, the design process considers the longevity of the buildings life i.e. cradle to grave, and the design incorporates safe access and egress.

- **We will help people to lead fulfilling lives;**

³⁴ Conwy Sustainability Strategy 2012 - 2017

*Developing economic recovery contingency plans in case the local area is impacted by flooding.
Increasing levels of awareness of flood and coastal erosion risks among individuals, businesses, and communities.*

Ensuring effective emergency plans are in place for flood and coastal erosion events.

Involving local people and community groups in risk assessment to raise awareness of risk from all local sources of flooding and coastal erosion and empowering them to manage those risks.

Giving local communities a greater stake in project design and delivery at an early stage, and seeking feedback at all stages.

■ **We will protect the natural environment; and**

Restoring the natural capacities of soil and vegetation to hold water or enhancing habitats such as salt marshes that help dissipate wave energy at the coast.

Identify areas suitable for inundation and water storage to reduce the risk of flooding elsewhere.

Reducing flood and coastal erosion risk in ways which create and link habitats and promote green infrastructure, thus adding to the total stock of biodiversity, as well as conserving important wildlife sites, and the ecosystem services this provides.

Flood defences that are adaptable and flexible as risk changes over time and resilient to extreme weather events and the longer term projected impacts of climate change.

■ **We will promote sustainability.**

Through selection, design and planning, construct land drainage infrastructure that is durable and easy to maintain.

Demonstrating compliance with a sustainable waste management strategy aiming for maximum re-use, maximum recycling, and zero waste to landfill.

Long term strategic planning in line with current trends of climate change.

11. Reviewing the Strategy

The Strategy will provide the framework for Conwy’s delivery of its flood risk management responsibilities and aspirations. Environment and Technical Services will review the strategy on a regular basis with assistance from other departments to monitor progression on the implementation of the measures. The departments involved will include but not exclusively; Emergency Planning, Highways and infrastructure Services, Planning, Legal, Social Services, Education, and Press.

It is a “living document” which will develop as new information, expertise and resources influence the delivery of the measures outlined in the Strategy. There will also be substantial changes in the next few years, with changes to the planning system and the requirements for sustainable drainage; in the provision of flood insurance; in the funding and design of flood prevention schemes; and with improvements in our knowledge of where the greatest flood risk are within the County. CCBC will take account of these changes and consider the implications in respect to the Strategy and make annual on-going adjustments to the Strategy as necessary.

The Strategy has been developed to deliver a short to medium term improvement plan to establish a sound evidence and knowledge base to develop a longer-term investment programme for FRM measures across the region. It is anticipated that the Strategy will become more focussed on the delivery of an affordable and funded capital programme of FRM works in the longer term.

It is proposed that a formal review of the Local Strategy should take place in 2017 following the review of the National Strategy in 2016, and to coincide with the review of the preliminary flood risk assessment as required by the Flood Risk Regulations. The Strategy should then continue to be reviewed every six years in conjunction with the review of the PFRA, unless circumstances dictate a more frequent review.

| Stages in Flood Risk Management | Date |
|--|--|
| Complete first Annual Action Plan to implement the strategy | Summer 2013 & each year thereafter |
| Publication of Flood Hazard and Risk Maps | 22 nd December 2013 & each six years thereafter (where appropriate) |
| Publication of Flood Risk Management Plans and completion of the first cycle of the Flood Risk Regulations | 22 nd December 2015 & each six years thereafter (where appropriate) |
| Publication of the second National Flood Risk Management Strategy by the Welsh Government | 2016 |
| Review and update of the Conwy Flood Risk Assessment (PFRA) | Spring 2017 & each six years thereafter |
| Complete first formal review of the Conwy LFRMS | Spring / summer 2017 & each six years thereafter (or where appropriate) |

Table 11.1: Timetable for CCBC for implementing the LFRMS review

Appendix A

Risk Management Authorities in Conwy County

| Environment Agency Wales | |
|---------------------------------|--|
| Address | Head Office Tŷ Cambria House 29 Newport Road Cardiff CF24 0TP |
| | Northern Area Office Ffordd Penlan Parc Menai Bangor Gwynedd LL57 4DE |
| Telephone | 08708 506 506 |
| e-mail | enquiries@environment-agency.gov.uk |
| Website | www.environment-agency.gov.uk |
| Floodline - Phone Number | 0845 988 1188 (24 hour service) Type Talk: 0845 602 6340 |

| Conwy County Borough Council | |
|-------------------------------------|--|
| Address | Bodlondeb Conwy North Wales LL32 8DU |
| Telephone | 01492 574 000 |
| Fax | 01492 592 114 |
| Website | www.conwy.gov.uk |

| Dŵr Cymru Welsh Water | |
|------------------------------|--|
| Address | Pentwyn Road Nelson Treharris CF46 6LY |
| Telephone | 01443 452300 |
| Customer Service | 0800 052 0140 |
| Website | www.dwrcymru.co.uk |

| North and Mid Wales Trunk Road Agency | |
|--|---------------------------------------|
| Address | Unit 7 Llys Onnen Ffordd y Llyn |

Conwy Local Flood Risk Management Strategy

| | |
|-----------|---|
| | Parc Menai Bangor Gwynedd LL57 4DF |
| Telephone | 01286 685186 or 01286 685180 |
| Fax | 01248 674975 |

| | |
|-------------------------|---|
| Welsh Government | |
| Address | Sustainable Places Welsh Government Cathay's Park Cardiff CF10 3NQ |
| Telephone | (Welsh) 0300 0604400 or 0845 010 4400 (English) 0300 0603300 or 0845 010 3300 (International Enquiries) (+44) 1443 845500 |
| e-mail | FloodCoastalRisk@wales.gsi.gov.uk |
| Website | www.wales.gov.uk |