



Torbay Council

Local Flood Risk Management Strategy

18th February 2015



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Section 1 - Introduction

1.1 Introduction

The occurrence and severity of flooding in recent years has increased. Following the Nation wide flooding in the summer of 2007 a government commissioned investigation was undertaken. The results of this investigation were published in the Pitt Review. The report summarised the failings of historic flood management resulting in 92 recommendations which were transposed into the Flood and Water Management Act 2010 (FWMA). The FWMA identified Unitary and County Council's as Lead Local Flood Authorities (LLFA's) and imposed a new statutory duty on the LLFA's to take leadership for the coordination and management of local flood risk.

Torbay Council as a Unitary Authority has been designated as the LLFA for Torbay and under Section 10 of the FWMA is required to develop, maintain, apply and monitor a Local Flood Risk Management Strategy (LFRMS) for Torbay. The purpose of the LFRMS is to address potential flood risk arising from local sources within the LLFA's area. Local flood risk under the FWMA is defined as any flood risk from surface water run-off, ordinary watercourses and groundwater. In addition to the local sources of flooding this LFRMS will identify all sources of flooding and detail the duties and powers held by the various Flood Risk Management Authorities (FRMA) in the management of these. The definition for all sources of flooding is identified in the following table:

1.2 Sources of Flooding

Local Sources of Flooding	
Surface Water Run-Off	Rainwater which is on the surface of the ground and has not entered a Main River, watercourse, drainage system or public sewer
Ordinary Watercourse	Includes all rivers and streams not designated as Main River, together with all ditches, drains, culverts, dikes, sluices, sewers (other than public sewers) and passages through which water flows.
Groundwater	All water which is below the surface of the ground and in direct contact with the ground or sub-soil. It is most likely to occur in areas underlain by permeable rocks, known as aquifers.
Other Sources of Flooding	
Main River	These tend to be the larger arterial watercourses and are often designated as Main River by the Environment Agency where they are considered to pose a significant flood risk.
The Sea	Tidal inundation from storm surges, high tides and wave action resulting in overtopping or breaches to the coastal defences.

Sewers	Hydraulic overload of sewers as a result of excessive storm water entering the sewer system
Highway	Surface water originating on the highway
Reservoirs	An impounded water body greater than 10,000m ³ where those defined as large raised reservoirs and as high risk are subject to the full requirements of the Reservoirs Act.

It is likely that changes in our climate will increase the risk and impact of flooding due to increased severity of storms and wetter winters. Flooding already poses a serious risk to the people, economy and environment of Torbay and climate change is expected to increase this risk, together with the rate of coastal erosion in the coming decades.

Communities at risk of flooding and coastal erosion can expect these risks to occur more frequently and the magnitude of the impacts to increase. It will not be possible to simply build larger drainage systems and defences in response to these increased risks and 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 LFRMS highlights the steps that are to be taken to improve knowledge of flood risk within Torbay, to work with other FRMA's and the public towards reducing the risks whilst aiming to balance the need of communities, the economy and the environment.

The strategy document provides information on the legislation that underpins Flood and Coastal Erosion Risk Management (FCERM) activities, the nature and extent of flood risks within Torbay and identifies further information that is required to build an improved understanding of local flood risks. In addition the strategy identifies the authorities and organisations involved and their roles in helping to reduce the flood risk within Torbay. Strategic objectives are identified within the document for managing flood risk and the measures that could be implemented to achieve these objectives. These objectives must be achieved whilst being consistent with the National Flood and Coastal Erosion Risk Management Strategy for England. This will be undertaken by following the guiding principles set out in the National Strategy.

It is proposed that an annual action plan will be produced to provide a more detailed overview of the works Torbay Council wish to undertake each year in order to manage the flood risk within its area.

Due to the current pressures on public funding, the funding available for FCERM is unlikely to be adequate to address all existing flood and coastal erosion risks and the increasing future risk brought about by further development and climate change. As a result flood risk management will need to be supplemented by partnership working and by those at risk of flooding taking responsibility to protect and help themselves.

Section 2 – Guiding Principles

The following are the guiding principles which flood risk management in Torbay 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 flood and coastal erosion risk management function.
- The public and private costs created from flood damage can be reduced in the long term by effective flood risk management.
- The decision 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 Torbay, 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 own 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 government alone.
- New developments should look not only to ensure that there is no increase in flood risk but where practicable an opportunity to deliver an overall reduction in flood risk.
- 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.
- 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.

Section 3 - Legislative Context

3.1 History of Flood Risk Management

The responsibility for flood risk management has changed considerably over the last 30 to 40 years. In December 1991 a number of pieces of legislation were enacted which aimed at consolidating existing water legislation. The most relevant piece of legislation enacted at this time in terms of flood risk management was the Land Drainage Act which outlined duties and powers to manage land drainage for a number of bodies including internal drainage boards and Local Authorities. In addition the Water Resources Act which outlined the roles and responsibilities of the National Rivers Authority (NRA) and the Water Act were also enacted.

The Environment Agency (EA) was established by the Environment Act in 1995 and on 1st April 1996 the EA took over the roles and responsibilities of the NRA. In addition the EA took over the responsibility for issuing flood warnings which previously had been the responsibility of the police.

Within England recent flood risk management policy changes were accelerated following major flooding events in 1998 and 2000. This resulted in the publication of Planning Policy Guidance Note 25 (PPG25): Development and Flood Risk in England and aims to direct development away from areas at high flood risk with justification and assessment of consequences if this cannot be achieved. PPG25 also encouraged Sustainable Drainage Systems (SuDS) to be implemented for any development where they would be effective.

Planning Policy Statement 25 (PPS25) superseded PPG25 in 2006 and reinforced the requirements for 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 brings it all together in one document. The NPPF still contains the same aspects regarding development and flood risk which are included in the Planning Practice Guidance dated March 2014.

Figure 3.1 below provides an overview of Flood and Coastal Erosion Risk Management responsibilities, and Figure 3.2 identifies how the Flood and Coastal Erosion Risk Management strategies and plans relate with other planning initiatives.

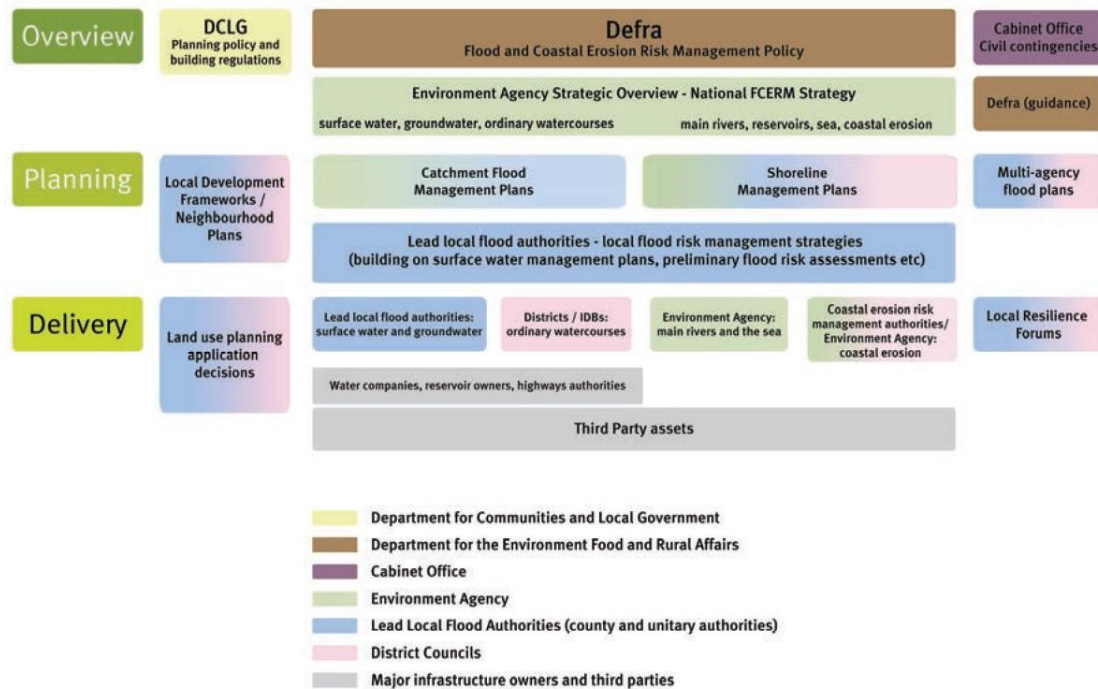


Figure 3.1 Flood and Coastal Erosion Risk Management – Overview

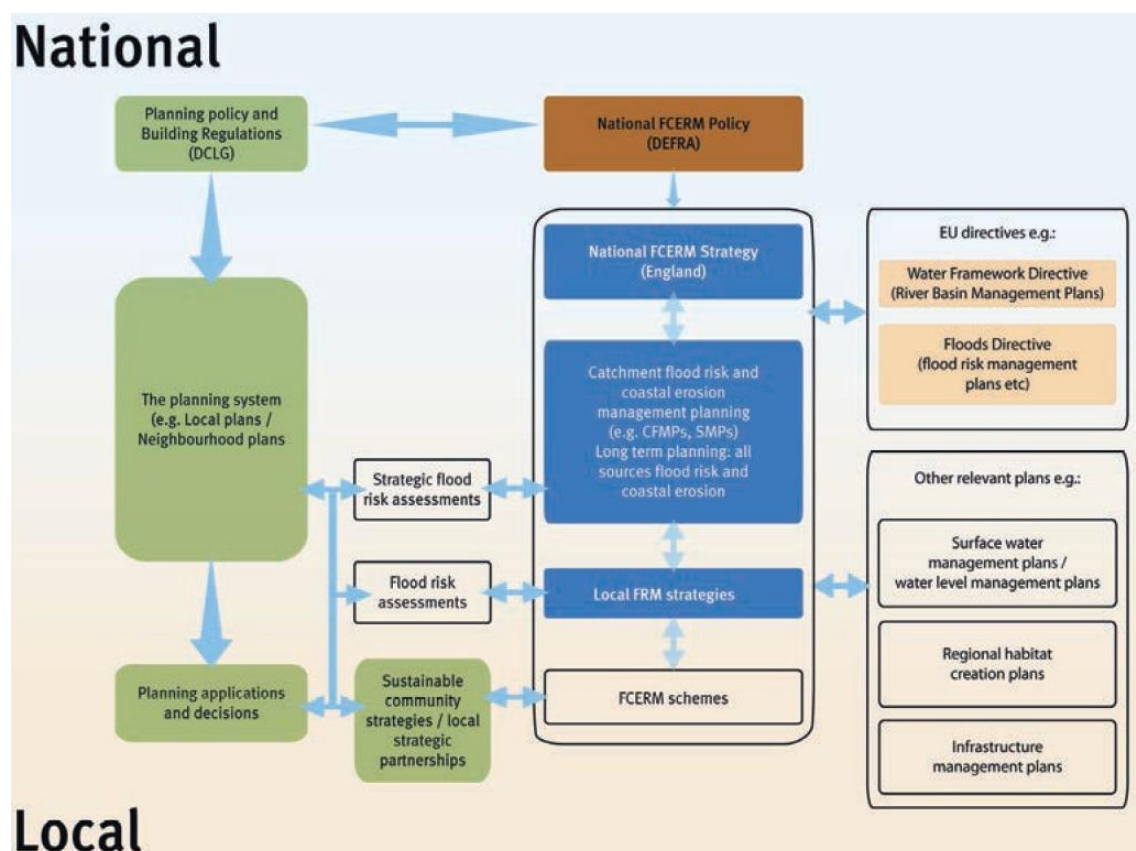


Figure 3.2 Relationship between Flood and Coastal Erosion Management Strategies/Plans with other planning initiatives.

3.2 The Flood and Water Management Act 2010

Following the widespread 2007 summer flooding, Sir Michael Pitt was commissioned to undertake an independent review of national FCERM practices and identify the lessons learned. The Pitt Review was published in June 2008 and called for fundamental changes to the manner in which flood risk was managed. The report identified 92 recommendations for the Government, Local Authorities, Local Resilience Forums and other stakeholders. These included the concept of Local Authorities having 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 now been enacted through the Flood and Water Management Act 2010.

Following Royal assent in April 2010, The Flood and Water Management Bill became an Act of Parliament. The Flood and Water Management Act 2010 reinforces the need to manage flooding in a holistic and sustainable manner and places a number of new roles and responsibilities on Local Authorities such as Torbay Council. Under the FWMA Torbay Council are designated as a Lead Local Flood Authority (LLFA) extending our previous responsibilities for flood risk management. It also gives the EA a national strategic overview of flood risk management roles.

The preparation of the LFRMS is just one of the duties placed upon Torbay Council under the FWMA.

3.3 The Flood Risk Regulations 2009

In addition to the FWMA another piece of legislation which introduces new roles and responsibilities, in relation to flood risk management, on Local Authorities is the EU Floods Directive which has been transposed into UK law by the Flood Risk Regulations 2009 (FRR). Under these regulations the EA are given a strategic overview role responsible for flood risk from the sea, Main River and reservoirs with the LLFA being responsible for local flood risk from ordinary watercourses, surface water and groundwater. Each LLFA must produce a Preliminary Flood Risk Assessment (PFRA) under their responsibilities and flood hazard maps and plans if required.

The PFRA for Torbay was published in June 2011 and did not identify any “Flood Risk Areas” within Torbay Council’s boundary. It should be noted that Flood Risk Areas for England were termed in the PFRA have been defined by Government guidance as an affected population of 30,000. As such Torbay Council are not required under the FRR to undertake the flood hazard and flood risk maps together with the flood risk management plans. The PFRA is to be reviewed on a six yearly cycle therefore Torbay Council will revise the PFRA by 2017. Should this review identify a Flood Risk Area, further flood hazard and flood risk mapping will be undertaken together with the production of a flood risk management plan.

During 2012/13 the Environment Agency and Ofwat have been developing a Drainage Strategy Framework. Drainage strategies will focus on the Water and Sewage Company's sewerage assets, whilst being aligned with stakeholder's plans for other elements of the drainage system. By considering the links within the drainage systems, organisations plans will be more integrated with one another and solutions to deficiencies and opportunities explored outside the sewerage system itself.

There are a number of other plans and reports that are available to assist in the delivery of this strategy. These will provide background information and data for flood risk issues within Torbay and these will feed into the strategy providing a baseline assessment. The PFRA for Torbay together with the Level 1 and Level 2 Strategic Flood Risk Assessments are key documents that will help to focus this strategy's action plan by prioritising high risk areas.

3.4 Links to the National Strategy

Under the FWMA the EA were required to produce a National Flood and Coastal Erosion Risk Management Strategy for England. This National Strategy identifies a framework for flood and coastal erosion risk management and identifies the requirements for the Risk Management Authorities involved.

The aim of the National Strategy is to ensure that flood and coastal erosion risk management is properly managed and co-ordinated using a full range of options and supporting local decision making and engagement in risk management. The National Strategy identifies strategic aims and objectives together with the measures proposed to achieve them by working with communities, other organisations and individuals.

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

The five principal objectives identified within the National Strategy are as follows:

1. Understand the risks of flooding and coastal erosion, working together to put in place long-term plans to manage these risks and making sure that other plans take account of them.
2. Avoiding inappropriate development in areas of flood and coastal erosion risk and being careful to manage land elsewhere to avoid increasing the risks.
3. Building, maintaining and improving flood and coastal erosion management infrastructure and systems to reduce the likelihood of harm to people and damage to the economy, environment and society.

4. Increasing public awareness of the risk that remains and engaging with people at risk to make their property more resilient.
5. Improving the detection, forecasting and issues of warnings of flooding, planning for and co-ordinating a rapid response to flood emergencies and promoting faster recovery from flooding.

The National Strategy also identifies six guiding principles for flood and coastal erosion risk management, ensuring that the needs of the community, economy and environment are taken into account. The local strategy must consider how these principles apply in Torbay ensuring that the local principles proposed are consistent with the national principles. This will then guide the process and decisions made in local flood risk management. The principles are as follows:

1. Community focus and partnership working
2. A catchment and coastal cell based approach
3. Sustainability
4. Proportionate risk based approaches
5. Multiple benefits
6. Beneficiaries should be allowed and encouraged to invest in local risk management.

The EA have the responsibility for reporting to the Government on flood and coastal risk management including the application of the National Strategy. As a result Torbay Council will report to the EA on the progress of the development and implementation of the Local Strategy in order for the EA to report to the government.

Section 4 - Roles and Responsibilities - Flood Risk Management Authorities

Risk Management Authorities are identified within the FWMA. Within the Torbay area the following Risk Management Authorities operate:

- Torbay Council – Lead Local Flood Authority
- Torbay Council – Highway Authority
- Environment Agency
- South West Water

The roles and responsibilities of each Risk Management Authority are identified within this section. It should be noted that some flexibility and fluidity is required between authorities when working in partnership. Under the FWMA Risk Management Authorities have a duty to cooperate with and provide information to each other and they also have the ability to take on flood and coastal erosion functions from another Risk Management Authority when agreed by both authorities.

Under the FWMA the Local Government Act 2000 was amended to include for overview and scrutiny committees to review and scrutinise the works by Risk Management Authorities on flood risk management functions that may affect the local authority's area. This was amended in order to ensure that the LLFA and other Risk Management Authorities are fulfilling their statutory duties under the FWMA.

Scrutiny Committees have powers to call upon Councillors and officers from any Risk Management Authority to give evidence or explanation about services. They have a legal power to require Members of the Council's Cabinet or officers to attend and give evidence and also to see Council files and documents on the issues they are investigating. In addition other people can be invited (but are not required) to contribute. When investigating other issues that affect the economic, social or environmental well being Torbay (e.g. flood prevention, climate change, etc) a Scrutiny Committee can make recommendations but cannot make other organisations or companies comply with them. The Council's Cabinet and relevant partners must then consider and respond to what has been recommended.

The roles and responsibilities for each Risk Management Authority are identified in the table below:

Flood Risk Management Authority	Roles and Responsibilities
Torbay Council – Lead Local Flood Authority	<p>Strategic and coordination role. Manage flood risk from:</p> <ul style="list-style-type: none"> • Surface Water • Ordinary Watercourses • Groundwater
Torbay Council – Highway Authority	<p>Manage flood risk from:</p> <ul style="list-style-type: none"> • Surface Water Originating on the Highway.
Environment Agency	<p>Strategic overview of coastal erosion and flood risk management for all forms of flooding. Manage flood risk from:</p> <ul style="list-style-type: none"> • Main Rivers • The Sea
South West Water	<p>As the water and sewerage company for Torbay, South West Water are responsible for operating and maintaining the condition of the sewerage systems (foul, surface water and combined sewers) in order to reduce the risk of sewer flooding. Protect water quality such as pollution from combined sewer overflows. Responsible for maintaining other services to customers such as water supply. Manage flood risk from:</p> <ul style="list-style-type: none"> • Sewer Flooding

Section 5 - Flood Risk in Torbay

5.1 Introduction

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

The likelihood of flooding happening in any one year can be expressed as a probability or annual chance of it occurring. For example a 1% annual probability of flooding or a 1 in 100 chance of flooding at a location in any year.

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

5.2 Local Flood Risk

Historically, there have been many flooding incidents recorded across Torbay from surface water and ordinary watercourses, with Main River and tidal influences often contributing. The development and urbanisation of Torbay over the years has contributed towards the increased flood risk, where land management changes are increasing surface water run-off rather than retaining water.

The table below identifies examples of significant flood events that have occurred within Torbay over the recent years. It should be noted that this list is not a comprehensive list of all flooding that has occurred in Torbay over the period from 1991 until 2014.

Year	Area Affected	Type of Flooding	Consequences
1991	Torquay	Surface water run-off and combined sewer	Intense rainfall event lasting 9 hours (total rainfall 37.1mm) resulted in 74 residential and commercial properties being flooded internally from the combined sewer system and surface water run-off.
1992	Torquay & Paignton	Surface water run-off, highway drainage, ordinary watercourse and combined sewer	A thunder storm lasting between 20 and 30 minutes (total rainfall 11mm) resulted in internal flooding to 46 residential and commercial properties.

1999	Torquay & Brixham	Surface water run-off, combined sewers and watercourses	Intense rainfall lasting 4 hours (total rainfall 34mm) resulted in internal flooding to 30 residential and commercial properties.
1999	Torquay & Paignton	Surface water run-off, combined sewers, highway drainage and watercourses	Intense rainfall event lasting 10 hours (total rainfall 57.2mm) resulted in 162 residential and commercial properties being flooded internally. It should be noted that the peak rainfall coincided with a high tide resulting in watercourses being tidelocked.
1999	Brixham	Ordinary watercourse (now Main River) and surface water run-off	Prolonged rainfall was experienced over a three week period with rainfall totals in excess of 170 mm. The most intense rainfall was over a four hour period when 57.8mm fell resulting in 37 properties suffering internal flooding.
2000	Torquay	Surface water run-off and combined sewer and ordinary watercourse	Intense rainfall lasting 75 minutes (total rainfall 30.4mm) resulted in internal flooding to 41 residential and commercial properties.
2004	Torquay & Paignton	Coastal	During severe easterly winds and high tides the sea walls at Torquay and Paignton were overtopped resulting in numerous residential and commercial properties being flooded in Paignton town centre.
2007	Torquay & Paignton	Surface water run-off, combined sewers, highway drainage and watercourses	Intense rainfall event lasting 5 hours (total rainfall 37.8mm) resulted in 64 residential and commercial properties being flooded internally
2012	Torquay, Paignton & Brixham	Surface water run-off, Main Rivers, ordinary watercourses, combined sewers and	Prolonged rainfall was experienced over a 6 day period with rainfall totals in excess of 130mm. During this event there were 24 reports on internal flooding and 34

		highway drainage	reports of external flooding to both residential and commercial properties throughout Torbay.
2014	Torquay, Paignton and Brixham	Coastal	During the storms in February 2014 overtopping of the sea defences was experienced on a number of occasions at Torquay, Paignton and Brixham sea fronts. Although only a small number of properties experienced flooding, many properties were at or near the threshold of being flooded.

Torbay is exposed to the combined potential flood risk from Main River (formerly critical ordinary watercourses, tidal and coastal flooding. Both the urban drainage systems and surface water run-off also contribute significantly to the historical flooding within Torbay.

Torbay Council is responsible for 36km of shoreline of which 9km is defended against coastal erosion by solid coastal defences. The remaining 27km consists of natural undefended cliffs.

5.3 Types of Flooding

Flooding can be caused from a wide variety of sources and interactions between these sources. The FWMA defines local flood risk as being the flood risk from:

- Surface water run-off
- Ordinary watercourses
- Groundwater

In many cases these sources can be interrelated and flooding can be caused by a combination of sources including those not identified as local sources such as Main Rivers or the sea.

Although this strategy is directed at managing flood risk from local sources the document takes into account the aims and objectives identified in the National Strategy for Flood and Coastal Erosion Risk Management. As a result all types of flooding that may occur within Torbay and that are covered by both the National and Local Strategies have been described below.

5.3.1 Surface Water Run-Off

Surface water flooding or run-off is caused by water flowing overland following periods of 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 due to the effects of climate change on future rainfall.

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 of flows across the ground. Precipitation that has entered a watercourse, Main River, or sewer system and overflows from there onto the surface is not defined as surface water run-off.

Surface water flooding is complex in nature and can be exacerbated by a number of different factors. These include: poor infiltration rates where water is unable to discharge to ground including impervious natural materials or man made materials, poorly maintained structures or under designed local drainage capacity allowing for insufficient attenuation of surface water run-off following periods of heavy Rainfall, and obstructions in watercourses leading to overtopping and flows over land.

Significant work has been undertaken by Torbay Council to identify the risk and probability of surface water flooding as part of the works undertaken in producing the Preliminary Flood Risk Assessment in June 2011.

5.3.2 Fluvial Flooding

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

Under the Water Resources Act 1991, Main Rivers are defined on the Main River maps and the EA retains their powers relating to these. Fluvial flooding from Main Rivers is outside the scope of this strategy, as it only deals with fluvial flooding from ordinary watercourses. However, as the Main Rivers have an impact on ordinary watercourses the strategy does take flooding issues from main rivers into account where appropriate.

Overseeing the management of local flood risk from ordinary watercourses that are not designated as Main Rivers are the responsibility of local authorities or where they exist inland drainage boards. In terms of ordinary watercourses the LLFA manages the risk from local floods under its responsibilities identified within the Land Drainage Act 1991 and the FWMA. The roles and responsibilities of the partners, organisations and land owners that manage the different flood risks are detailed further in Sections 2, 9, 10, 11, 12 and 13 of this report.

5.3.3 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 water that is not lost to surface water run-off and evapo-transpiration. Groundwater forms the foundation of the base flows within rivers and ordinary watercourses which are topped up with surface water 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 in underground 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 rainfall (either local or within the aquifer catchment area) and can occur many hours or even days after the precipitation has finished and can remain insitu for long periods of time. Other factors that can influence groundwater levels include reduced abstraction rates or changes to underground flows.

In Torbay flooding attributed directly to groundwater is 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 and commercial buildings 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. They may decide not to report these incidents of flooding to the Council as limited damage to personal belongings has occurred. As such historical records relating to groundwater flooding within Torbay is limited.

5.3.4 Sewer or Highway Flooding

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

Within Torbay, South West Water (SWW) is the water company with the responsibility for managing and maintaining the public drainage systems (combined sewers, surface water sewers and foul sewers). SWW 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 Torbay are known as DG5, which are provided to Ofwat.

5.3.5 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 2007 floods recommended that the Government should provide flood maps to identify areas that could be affected should a large reservoir fail and release the water it holds to allow plans to be prepared for an emergency response. In 2008 Defra instructed the Environment Agency to assess the impact of dam breach flooding from all raised reservoirs in England and Wales which were registered under the Reservoirs Act 1975. The Environment Agency published flood maps showing the “Risk of flooding from Reservoirs” in 2014.

The Reservoirs Act classifies a reservoir as one that is capable of holding at least 25,000m³ of water above the lowest natural ground level above the natural level of the surrounding land. The FWMA classifies a raised structure or area that is large if it is capable of holding 10,000m³ of water above the lowest natural ground level above the natural level of the surrounding land.

Within Torbay there are no reservoirs that fall under the Reservoir Act.

5.3.6 Coastal Flooding

Flooding from the sea occurs when water levels or waves overtop the crest of the coastal defences, or when defences are breached or collapse. The probability of a breach is dependant on four main factors, which are: weather conditions (generating large waves), wind direction (on-shore), high tides (particularly during spring tidal events) and the structural condition of the coastal defence. 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 a storm surge and the most well known incidence within Torbay occurred in August 2004 where a combination of gale force winds, a high spring tide and rough seas caused many of Torbay’s flood defences to be overtopped.

There is a risk of tidally influenced flooding along the entire coastline of Torbay especially in the main urban areas of Torquay, Paignton and Brixham.

5.3.7 A Combination Event

Details of individual sources of flood risk does not imply that flooding can only occur for one reason. Any number or all of the sources mentioned above can come together to produce what are known as combination events.

An example of a combination flood event is one occurring during a period of intense or prolonged rainfall. The rain would increase water levels in watercourses and Main Rivers, saturating ground, increase flow through the drainage system and could enter the public sewer system, increasing pressure. As all of these factors combine, watercourses, Main Rivers, drains and sewers could all reach maximum capacity

and with nowhere else to discharge, water could overflow from all of these resulting in a combination of watercourse, 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 high tide. This results in an increase in tidal and wave levels at the same time as high flows from rivers and watercourses. If the two meet coastal communities could experience a mix of flooding from the sea, river and watercourses.

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 the lead to ensure that investigation, assessment and appropriate mitigation measures are undertaken.

5.4 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 levels.

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.

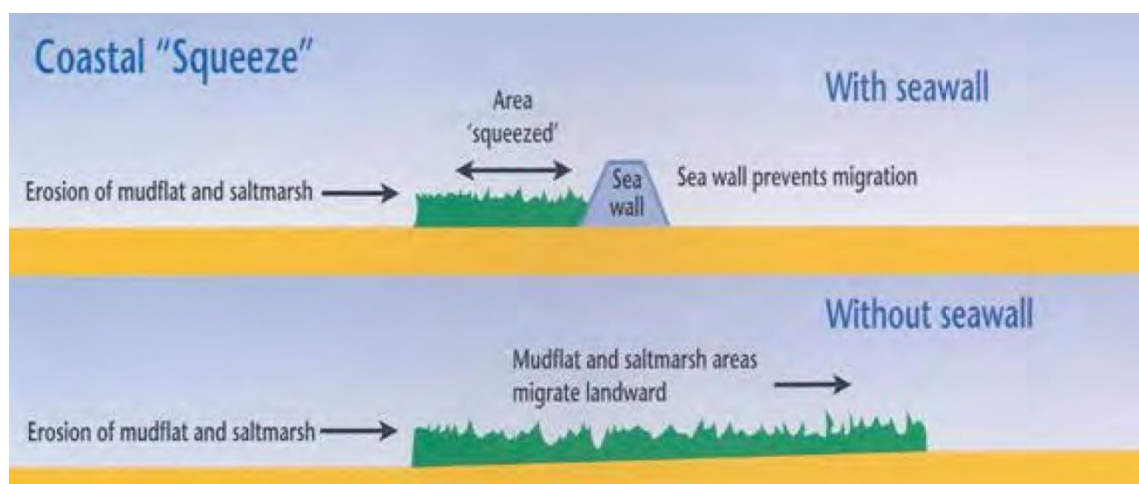


Figure 5.1 – Coastal Squeeze (Environment Agency)

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 the defence of make it more likely that the 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 nurseries, as well as recreational and tourism opportunities for local communities. These habitats can provide multiple benefits to society, the economy and the environment.

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.

5.5 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 within Torbay. There are many factors that can increase flood risk, some of which are included in the following table.

Factors which may increase flood risk in Torbay		
Weather	Hydrological	Human
Rainfall	Soil moisture level	New development and changes in land use (e.g. hard standing surfaces due to urbanisation)
Extensive storm events	Groundwater level prior to storm event	Building within the flood plain
Small-scale storm events	Natural surface infiltration rate	Obstructions to flows within the flood plain areas
Temperature	Presence of impervious surfaces	Lack of maintenance on open watercourses and culverted watercourses
Snowfall and snowmelt	Channel cross-sectional shape and roughness	Deterioration in the condition and performance of existing drainage infrastructure
Hailstorms	Presence or absence of over bank flow	Climate change resulting in more frequent and more severe extreme weather
Low pressure contributing to tidal surge and higher than predicted tidal levels	Synchronisation of run-offs from various parts of the catchment	Diversion of watercourses

Wind	Sea state	Illegal surface water connections to foul and combined sewers
		Change in flow paths (sandbagging, landscaping, etc.)
		Land Management and farming practices
		Failure of critical infrastructure (burst water mains, collapsed pipes/culverts, loss of power to pumping stations, etc.)

5.6 Methodology for Identifying Areas of Risk

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

Significant consequences were defined by the Government and Department for Environment and Rural Affairs within the guidance on selecting and reviewing Flood Risk Areas for local sources of flooding which was published in December 2010. In this document Defra have outlined agreed key risk indicators and threshold values which must be used to determine the national Flood Risk Areas.

The methodology is based on using National flood risk information to identify 1km squares where local flood risk exceeds a defined threshold. Where there are 5 or more adjacent squares, a cluster area is formed, showing areas where flood risk is most concentrated. If a cluster area contains over 30,000 people predicted to be at risk of flooding, this area will be designated as a national indicative flood risk area.

The methodology outlined above has been followed at a national scale and 10 flood risk areas across England have been identified. None of these areas fall within the Torbay Council boundary. The largest cluster area in Torbay is located within Paignton where 7,972 people are at risk of flooding.

It is clear from the information gathered as part of the production of the PFRA that the surface water flood risk within Torbay is significant. The following table identifies the number of people at risk from surface water flooding in Torbay based on the PFRA assessments. This figure has been split into the total number at risk in each town and within specific sub-catchments.

Number of People at Risk from Surface Water Flooding

Town	Number of People at Risk of Flooding	Sub-Catchment	Number of People at Risk of Flooding
Brixham	1,675		
Galmpton	150		
Paignton	4,168	Clennon Valley Victoria Stream Ocombe Valley Other areas including Collaton St Mary and Yalberton Watercourse	473 1,404 2,008 283
Torquay	3,908	Torre Abbey River Fleet Edginswell Babbacombe	1,137 1,952 367 452

5.7 Limitation of Data

The assessment of flood risk to date within Torbay has been completed based on the best information that is currently available. However there are inherent limitations with this information and it is important that these are identified (see following table). The main data limitations were the consistency and reliability of the collection of past flooding information.

Limitations of Datasets Used to Prioritise Locally Important Flood Risk Areas

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 Torbay.	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	Obtain the complete British Geological Survey (BGS) dataset for key areas, which provide a more accurate overview of areas where geological conditions suggest groundwater might

	flooding occurring	emerge.
Flood History across Torbay	Flood history collected through the PFRA is generally inconsistent. It is difficult to make a fair and accurate assessment of flood risk across Torbay 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 more accurate level of flood history in the future).
Flood Map for Planning i.e. Flood Zone Maps	Modelling used a national methodology with a standard set of assumptions (such as a standard approach to modelling the floodplain) which may not be suitable for the whole of Torbay.	Detailed fluvial modelling within locally important flood risk areas will provide a better understanding of flood risk, mechanisms and consequences. e.g. culvert blockage and tidal influence.
Torbay Council Strategic Flood Risk Assessments – Level 1 and Level 2	Input data, accuracy of ground model, dry weather flows and use of a simplified model	With improved availability of data, review these documents and update.

Section 6 - Climate Change

6.1 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 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, 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 % increase, depending on variable) to the baseline.

Guidance has been provided on climate change from Defra and the EA. It is recommended 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 England 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 Plans – produced by the Environment Agency

- Shoreline Management Plans – Produced by Coastal groups, composed of maritime Local Authorities, Environment Agency, Natural England, National Trust and others.

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 change.

Section 7 - Regional and Local Plans

7.1 Regional and Local Plans

There are a wide variety of publically available documents which identify the flood risks within Torbay. These include:

- Torbay Council Preliminary Flood Risk Assessment Report -
<http://www.torbay.gov.uk/index/yourbay/environment/floodriskman/preliminaryfloodriskassessment.pdf>
- Torbay Council Level 1 Strategic Flood Risk Assessment -
<http://www.torbay.gov.uk/index/yourbay/environment/floodriskman/level1floodriskassessment.pdf>
- Torbay Council Level 2 Strategic Flood Risk Assessment -
<http://www.torbay.gov.uk/index/yourbay/environment/floodriskman/level2floodriskassessment.pdf>
- South Devon Catchment Flood Management Plan – Summary Report June 2012 -
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/294030/South_Devon_Catchment_Flood_Management_Plan.pdf
- South Devon and Dorset Shoreline Management Plan 2 -
<http://www.sdadcag.org/docs/html/frameset.htm>

In addition to the above documents, the following document is available to the Flood Risk Management Authorities:

- The Brixham, Paignton and Torquay High Risk Flood Response Plans

Section 8 - Managing the Likelihood of Flooding

8.1 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 recommended that future legislation (Flood and Water Management Act 2010) (FWMA) addresses all sources of flooding, clarifies responsibilities and facilitates flood risk management. The FWMA subsequently defined certain organisations as Risk Management Authorities in England whom have roles and responsibilities around flooding. The Risk Management Authorities in Torbay are:

- Environment Agency – who are responsible for managing flood risk from Main Rivers and the sea, and also have a strategic overview role over all flood and coastal erosion risk management and for regulating the safety of reservoirs. In addition the EA have a key role in providing flood warnings to the public.
- Torbay 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.
- South West Water (SWW) – is the regional water and sewage treatment company serving the Torbay area. SWW is responsible for flood risk from sewers and burst pipes.
- Torbay Council as Highways Authority – is responsible for managing flood risk on roads and highways within the area.

All of the Risk Management Authorities identified above have the following new responsibilities under the FWMA:

- 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.

Cooperation with other risk management authorities includes the following:

- Discussing with other Risk Management Authorities before designating structures;
- Report local flooding incidents to the Flood Risk Manager at Torbay Council;
- 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 the 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 Torbay.

Each Flood 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 not being devised at a time of substantial public sector budget cuts, the organisation would still not be able to prevent all floods or solve all concerns. That is why the powers and responsibilities of Torbay's citizens are also recorded in this section.

Section 9 - Responsibilities of Environment Agency

9.1 Introduction

The Environment Agency (EA) 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 EA has new operational responsibilities for flooding from rivers and the sea. The EA also has a wider oversight role for all flood and coastal erosion risk management in England.

As part of this oversight role the EA 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, the national raising awareness programme, and the single point of contact for enquiries and information on flood risk, currently being piloted via the Floodline Warning Service.

The FWMA places a number of statutory duties on the EA including:

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

The EA 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 the Government; and
- As requested, provide interpretive advice to the Government.

It will be for the Government to determine what, if any, action should be taken if the reports from the EA 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 EA 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 and coastal erosion flood risk;
- The expansion of powers to undertake works to include broader risk management actions; and

- The ability to cause flooding and coastal erosion under certain conditions.

This new allocation of responsibilities is also consistent with the EA'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 EA as well as providing guidance to Local Authorities on these matters for flooding from other sources.

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

The EA'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.

9.2 Coastal Erosion Risk Management Authority

EA 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 LLFA's have required EA approval to undertake coastal protection works.

9.3 Emergency Planning

EA contributes to the development of multi-agency 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 EA 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.

9.4 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 EA has powers to carry out flood defence works on Main Rivers only. The overall responsibility for maintenance of Main Rivers, however, lies with the riparian owner.

The EA can also bring flood defence schemes through the Regional Flood and Coastal Committees, and it will work with LLFA's and local communities to shape schemes which respond to local priorities.

A plan of the Main Rivers within Torbay is shown in Appendix 1

9.5 Coastal Flooding

EA is the lead organisation responsible for all flood and erosion risk management around the coastline of England, including tidal flood risk. EA 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.

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

9.6 Reservoirs

The EA enforces the Reservoirs Act 1975, which is the safety legislation for reservoirs in the United Kingdom. EA 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 following the relevant parts of the FWMA commencing, reservoirs with a capacity of 10,000m³.

As the enforcing authority the EA are responsible for:

- Maintaining a register of reservoirs and making this information available to the public;
- Ensuring that reservoirs are designed and constructed in accordance with 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 Defra; and
- Acting in an emergency if the owner fails to take appropriate action.

The EA has now produced reservoir flood maps which show the effects on the downstream catchment of a dam breach for approximately 2,000 large raised reservoirs which they regulate under the Reservoirs Act 1975. These have been sent to the reservoir owners and the relevant local authorities.

Section 10 - Powers and Responsibilities of Torbay Council

10.1 Flood and Water Management Act 2010

10.1.1 Introduction

The FWMA identified Torbay Council as the Lead Local Flood Authority for Torbay. 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. Torbay Council also has other related roles in emergency planning, regulatory services and highway drainage which are detailed in the following sections.

Following implementation of the Act, Torbay Council Engineering Section have taken 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. The Engineering Section already carried out similar duties and had formed the necessary relationships with other departments and external bodies to undertake this role.

10.1.2 Roles as a Lead Local Flood Authority

The FWMA 2010 identifies Torbay Council as the LLFA for the administrative area of Torbay. This gives 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 Torbay Council a number of permissive powers which allow them to do something, but do not compel them to and are defined in the following table:

Statutory Duties	Permissive Powers
<ul style="list-style-type: none"> • Strategic leadership 	<ul style="list-style-type: none"> • Powers to designate structures and features that affect flood or coastal erosion risk
<ul style="list-style-type: none"> • Comply with the National Strategy • Co-operate with other authorities 	<ul style="list-style-type: none"> • Powers to request information • The expansion of powers to undertake works to include broader risk management actions
<ul style="list-style-type: none"> • Recording and investigating flood incidents 	<ul style="list-style-type: none"> • The ability to cause flooding or coastal erosion under certain conditions
<ul style="list-style-type: none"> • Keep a register of assets likely to affect flood risk 	
<ul style="list-style-type: none"> • Contribute to sustainable development 	

Following the commencement of Schedule 3 of the FWMA (date still to be confirmed by Government) LLFA's 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 England and Wales are also designated as coastal erosion risk management authorities under the Coast protection Act 1949, providing 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.

10.2 Torbay Council Engineering Section

10.2.1 Introduction

Torbay Council's Engineering section has taken the lead in delivering and implementing the requirements of the FWMA. This task requires input and partnership working with other relevant departments in Torbay Council. Some of the tasks outlined in the following sections have been core activities for the Council over a number of years and processes are in place to deliver those tasks. Other tasks, however, relate to new responsibilities which have recently been assigned and will require new processes to be developed and implemented.

10.2.2 Strategic Leadership

Torbay Council is responsible for co-ordinating and overseeing flood risk management on a day to day basis across the Bay. In practice Torbay Council took the lead in dealing with surface water, groundwater and ordinary watercourse flooding incidents prior to the changes contained within the FWMA; however the responsibility has now been allocated to Torbay Council by law. At the onset, this involves developing this strategy which will set out Torbay Council'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.

Torbay Council's Engineering Section chair the Torbay Council Flood Steering Group which is attended by officers and councillors together with the EA and SWW.

This provides an opportunity for discussions regarding all flood risk issues throughout the Bay.

In addition Torbay Council's Engineering Section are members of the Devon Strategic Drainage Group and the South West Lead Local Flood Risk Managers Group. These groups are made up of other Flood Risk Management Authorities. The groups were formed to improve communications between the Flood Risk Management Authorities and discuss various issues and best practices.

10.2.3 Recording of Flood Incidents

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

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. Torbay Council have set a standard to record every flood incident that occurs in the Bay. A detailed investigation, as set out in Section 19 of FWMA will be carried out when certain criteria are met and these are explained in more detail in the next section.

Torbay Council 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. Torbay Council have already begun to assemble a record of flood incidents which have been imported into an Asset Management System. Torbay Council will continue to update this system as and when flooding occurs and when combined with mapping of future flood risk in the Bay it will help provide a picture of the highest flood risk areas within Torbay.

Statutory bodies, such as SWW and EA will also receive and record information regarding flood incidents which may come under Torbay Council 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 proactive involvement in flood risk management and provide us with information on flood incidents.

Torbay Council's aim is to obtain as much information on flooding incidents that occur across the Bay 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 Torbay 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 the following email address: Highways@torbay.gov.uk. The information required is as follows:

- Name and contact details
- Date of flood
- Location of the flood (map reference or precise address)
- The duration of flood
- The depth of flood water at its worst
- Where did the flood water come from? e.g. combined sewer; watercourse; highway
- What was the weather preceding the flooding, rainfall if known
- Did water enter the property? Which properties?
- What damage did the flooding cause? e.g. road blocked for several hours
- Was any action taken at the time to reduce the flood risk
- Any other relevant information
- Photographs and videos of the flood and damage during the flood.
- Has this flooding occurred before and if so when?

10.2.4 Investigation of Flood Incidents

A LLFA has a duty to investigate all sources of significant flooding events. The national definition of a significant flood event is not available 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 widespread, significant flooding affecting large areas of Torbay, 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.

A detailed flood investigation report in accordance with Section 19 of the FWMA will be produced by Torbay Council following a flood event where 5 properties or more suffer internal flooding.

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 information.

There are two stages of flood investigations for flooding incidents and land drainage issues in Torbay. These are as follows:

Stage 1 – Initial Inspection

Once an incident of flooding or drainage issues has been reported and recorded, if it is unclear which authority holds responsibility for managing the incident or it has been identified that Torbay Council is the relevant 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. Torbay Council will record every flood incident that occurs in the Bay using a site inspection report which will include various fields for information and flood officers notes. The asset management system will 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 – Flood Investigation Report

For stage 2 investigations, a flood investigation report is required, which will aim 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 flood investigation report should be carried out where the following criteria are met:

- Where internal flooding of five or more properties has occurred during a 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 was affected by flooding for more than 10 hours.

Once completed all flood investigation reports will be published on Torbay Council's website.

10.2.5 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.

Torbay 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 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 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 responsibilities 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 Torbay most of the coastal assets are the responsibility of Torbay Council or private land owners.

It will take many years before the register is sufficiently comprehensive to be of real value in flood risk management. Torbay 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 watercourse on Torbay Council owned land;
- Fluvial assets on Torbay Councils owned land;
- Demountable defences;

- Maintenance schedule

Torbay Council 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 who 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;
- Develop an appropriate maintenance plan for each asset.

The register will be available to view at Torbay Council's offices.

10.2.6 Sustainable Drainage

Torbay Council has a duty to aim to contribute towards the achievement of sustainable development in the exercise of flood or coastal erosion risk management functions. The ways in which Torbay Council will work to achieving sustainable development in the flood and coastal erosion risk management role are described in Section 14 of this strategy.

10.2.7 SuDS Approval Body (SAB)

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:

- Allowing water to soak into the ground (infiltration);
- Storing run-off and releasing it slowly (attenuation);
- Slowly transporting (conveying) water on the surface;
- Filtering out pollutants;
- Allowing sediments to settle out by controlling the flow of water.

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

The FWMA assigns Torbay Council the role of a SuDS approval body (SAB) for Torbay. When this aspect of the Act (Schedule 3) is enacted 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;
- Ensure that all adopted SuDS schemes are properly maintained.

SuDS draining public highways will be adopted by the Highway Authority. The EA is a statutory consultee for the approval process for development located within Flood Zones 2 and 3 or for any development site occupying an area greater than 1ha and must respond within 21 days of being contacted about an application.

An important provision in the FWMA 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. Torbay Council will be producing a local SuDS design guide in accordance with National Standards, to advise on what the expectations are for the design of drainage, which is expected to be out for consultation after the National Standards have been published 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 Torbay Council and will be done either by itself or by a contractor provider.

10.2.8 Designating Assets

The relevant clause of the FWMA have now been commenced (August 2012) therefore empowering Torbay Council and the EA 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 EA.

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.

10.2.9 Meeting the Flood Risk Regulations

The Flood Risk Regulations 2009 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 on both the Torbay Council and EA websites.

The information contained within the PFRA will be reviewed in 2017 and every six years thereafter. The Flood Risk Regulations also requires that all LLFA prepare flood hazard and flood risk maps for any indicative flood risk area to be published by December 2013. This will be followed by a flood risk management plan which will be published in December 2015.

10.2.10 Consenting Works on Ordinary Watercourses

Torbay Council 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 transferred to enable the LLFA to implement their new roles and responsibilities in respect of local flood risk. The EA still retain their responsibility of consenting works on Main Rivers. A plan identifying the ordinary watercourses and Main Rivers within Torbay is included in Appendix A.

If riparian owners or other bodies wish to culvert an ordinary watercourse or insert a weir, dam or similar like obstruction, then consent is required. The purpose of ordinary watercourse regulation is to control activities that may have an adverse flooding impact.

It is essential that anyone who intends carrying out works either temporary or permanent in, over, under or near a watercourse 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 Torbay Council's Engineering Section to discuss any applications, and an application form is available on the Torbay Council website.

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 requirement for the works and that mitigation measures have been proposed and considered to be acceptable by Torbay Council. Torbay Council supports a general statement to discourage culverting of watercourses as follows:

“Culverting of existing watercourses within Torbay 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.”

10.2.11 Coast and Land Drainage Inspections

Torbay Council are responsible for many of the coastal defences within Torbay. Inspections of the Council's defences are on a risk based schedule. All defences are inspected at least once a year however the highest priority defences (those that are affected by south easterly storm conditions) are inspected after every major south easterly storm event. 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 ownership 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 a member of the Engineering Section will undertake an inspection. Where maintenance works are necessary the riparian land owner will be informed of their duties under the Land Drainage Act to carry out works. Torbay Council has powers to enforce necessary works to be carried out if they are not completed in a reasonable length of time.

10.3 Emergency Planning

10.3.1 Emergency Preparedness

The Civil Contingencies Act 2004 places duties upon Torbay Council (and other category 1 responders) to prepare for emergencies. Activities undertaken to prepare for flood events include:

- Assessing the risk of flooding in within the Devon, Cornwall and Isles of Scilly and present this information within the Community Risk Register;
- Putting in place flood plans;
- Working with partners to develop evacuation plans for flood risk areas;
- Maintaining a database of vulnerable persons and sites;
- Preparing recovery plans to enable the process of rebuilding, restoring and rehabilitating the community following a flood event;
- Putting in place business continuity plans to enable the Council to maintain the delivery of essential services;
- Providing advice and assistance to business and voluntary organisations about business continuity management;
- Providing information to the public on how they can prepare for flooding;

- Working with communities and support community resilience initiatives to ensure that they are prepared for severe weather events, and able to recover from the impacts of flooding;
- Maintaining arrangements to warn, inform and advise the public of flooding;
- Developing procedures for the provision of an emergency call centre;
- Sharing information and co-operate with other local responders to enhance co-ordination and efficiency of pre-planning activities;
- Supporting the development of multi-agency communications strategy and notification procedures;
- Inspecting and maintaining flood alleviation schemes and other critical assets;
- Providing sandbags to help residents reduce the risk of property flooding;
- Taking action to maintain public safety and secure assets in and around the Torbay Harbour Authority estate;
- Maintaining emergency contact details to notify staff in an emergency; and
- Providing 24/7 cover for responding to flood events.

10.3.2 Multi-Agency Partnership Working

Torbay Council is a member of the Devon, Cornwall & Isles of Scilly Local Resilience Forum. The Local Resilience Forum (LRF) is a multi-agency partnership made up of representatives from the emergency services, local authorities, the NHS, the Environment Agency and other partners. These agencies are known as Category 1 Responders.

Local Resilience Forums were established in response to the statutory requirements of the Civil Contingencies Act 2004 which places duties upon Category 1 Responders to:

- Assess local risks;
- Put in place emergency plans;
- Put in place Business Continuity Management arrangements;
- Put in place arrangements to make information available to the public and maintain arrangements to warn, inform and advise the public in the event of an emergency;
- Share information with other local responders to enhance co-ordination; and
- Co-operate with other local responders to enhance co-ordination and efficiency; and

The LRF is supported by organisations, known as Category 2 Responders, such as the Highways Agency and the public utility companies who have a responsibility to share information and co-operate with Category 1 Responders.

The LRF also works with wider partners such as the Military and the Voluntary Sector who provide a valuable contribution to emergency preparedness.

The LRF has a well established Severe Weather Task and Finish group whose role is to assess flood risk and ensure that appropriate control measures are in place to mitigate the impacts of flooding. The Emergency Planning service represents Torbay Council on this group.

10.3.3 Emergency Response

The role of the Council during a major flood event, is to support and assist the emergency services with life saving and operational activities; then take the lead during the recovery phase to facilitate the community's return to 'normality'.

Torbay Council has a wide range of functions that are likely to be called on in support of the emergency services during the response to flooding. A major flood event may require the Council to:

- Provide appropriate representation at multi-agency strategic and tactical coordinating groups;
- Establish appropriate incident management structures to coordinate the Council's response to a flood event;
- Share information and co-operate with other local responders to enhance co-ordination and efficiency during the response to a flood event;
- Liase with utility service providers;
- Support the emergency services with the evacuation of properties at risk from severe flooding;
- Provide signage for road closures and diversions;
- Manage transport disruption caused by flooded highways;
- Open and staff emergency rest centres;
- Provide transport for evacuees attending rest centres;
- Arrange temporary or permanent re-housing;
- Provide appropriate welfare support to vulnerable children;
- Arrange appropriate welfare support for vulnerable adults;
- Coordinate support from the voluntary sector;
- Support the response to public health and environmental health incidents;
- Provide / seek advice where flooding affects public health;
- Establish a temporary mortuary in liaison with Devon & Cornwall Police and HM Coroner (only if catastrophic flooding has caused mass fatalities); and
- Maintain essential services that normally fall within the day to day responsibilities of the Council.

10.3.4 Recovery

Torbay Council is responsible for leading the process of rebuilding, restoring and rehabilitating the community following a major incident. Where major flooding has occurred the Council may need to establish a Recovery Coordinating Group to coordinate the recovery process.

The purpose of the Recovery Coordinating Group is to:

- Assess the impact on affected communities;
- Take account of the concerns, feelings and initiatives of residents and businesses;
- Coordinate support and visits from politicians and VIP's;
- Ensure effective communication/consultation with affected communities;
- Assess the physical and psychological impacts on people's health and coordinate assistance by the various agencies;
- Provide temporary or longer-term accommodation for residents made homeless by the flooding;
- Coordinate and provide specialist scientific and technical advice including on public health and the environment;
- Assist residents in removal of damaged furniture and household goods;
- Assess the level and nature of damage to essential services / assets, building / structural, transport, health and educational infrastructure;
- Develop a remediation strategy to cover clean up, repair or replacement of physical assets and infrastructure;
- Assess the damage to the natural environment and arrange for clean up;
- Assess the economic implications for the affected area and enable affected businesses to resume trading as soon as possible; and
- Assess the financial and legal implications for the affected area and different streams for financial aid (e.g. Belwin and other Flood Support Schemes.)

10.4 Torbay Council Highway's Section

10.4.1 Introduction

Torbay Council's Highways Section are responsible for the highway network within Torbay. All Highway Authorities are classified as Risk Management Authorities under the FWMA and must adhere to all the responsibilities imposed on Risk Management Authorities; a duty to cooperate with other Risk Management Authorities and authority to take on flood and 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, Highway Authorities have further responsibilities which are detailed in the following sections.

10.4.2 Responsibility to Maintain the Highway

Under the Highway Act, the Highway Authority has a duty to maintain the highway. This includes ensuring the highway drainage systems and culverts under the highway are clear and that blockages are cleared. As part of this duty, roads are regularly inspected and maintained.

10.4.3 Adoption of SuDS

Highway Authorities currently have the power to adopt SuDS that serve the highway through Section 30 of the Highways Act but are under no obligation to do so. Under the FWMA, Highway Authorities will be required to adopt any SuDS approved by the SAB which exist within the highway boundary.

10.4.4 Powers to Deliver Work

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 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.

10.4.5 Response in an Emergency Flooding Event

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

- The means to transport people through it's contacts with local bus, coach and taxi operations 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.
- Use the Torbay Council control centre facilities and establish media contacts to keep staff and the public across the bay informed of 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.

10.5 Torbay Council Harbour Authority

10.5.1 Responsibilities

Torbay Council's Harbour Authority are responsible for the entire infrastructure located on the Harbour Estate within Torbay. As the Harbour Authority are part of Torbay Council and therefore they must adhere to the responsibilities imposed on Torbay Council as a Risk Management Authority under the FWMA.

Torbay Council Harbour Authority is responsible for the maintenance and upkeep of the harbour infrastructure that has been designated as flood defence or coastal erosion structures. These structures include Haldon Pier and Princess Pier in Torquay together with Victoria Breakwater in Brixham.

10.6 Torbay Council Local Planning Authority

10.6.1 Responsibilities

The functions of the Torbay Council Local Planning Authority are within two main departments, Strategic Planning and Development Management.

The main role of strategic planning is to produce and monitor a Local Development Plan (LDP). The LDP is supported by a number of background papers and supplementary planning guidance documents. For all land allocations in the LDP, statutory bodies are consulted. The comments of the EA and the Council's Engineering Section in relation to flood risk are considered in the assessment of development and whether sites are allocated or not.

The strategic planning services affect 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 considered flood risk;
- Assessing flood alleviation works;
- Responding to EA or SWW on consultations involving flooding issues as a service.

The main role of the Development Management team is to process and determine planning applications, which includes the consideration of flood risk assessments. In the future the Development Management team will work alongside the SAB to assess planning applications and complimentary drainage applications.

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

- Produce a Strategic Flood Risk Assessment (SFRA). 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 within the floodplain. Consequently the LDP should support the SFRA, the PFRA and where applicable surface water management plans. 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 a 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, Local 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 egress, 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 at lowest probability of flooding through embedding the sequential approach;
- 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;
- Ensure that neighbourhood plans fully consider flood risk issues.

When the SAB comes into force, the Local Planning Authority will:

- Alert developers and land owners at the pre-application stage of the need to consult with the SAB about drainage issues on the site;
- Send drainage applications to the SAB;
- Provide local guidance for assessment of drainage matters in planning applications;
- Advise developers to discuss with the LLFA whether land drainage consent is required for alterations or new structures within an ordinary watercourse.

Section 11 - South West Water

11.1 Introduction

South West Water (SWW) is the only company serving Torbay providing both water supply and wastewater services. SWW 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.

The FWMA 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;
- A duty to cooperate 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 Torbay.

11.2 Transfer of Responsibilities

The Water Industry (Scheme for Adoption of Private Sewers) 2011 Regulations facilitated the transfer of private sewers, lateral drains and pumping stations to the water and sewerage companies in England and Wales. Before October 2011 home owners were responsible for their private drains up to the point where they join to the public sewer and where a pipe served several properties the home owners were jointly and equally responsible. Following October 2011 SWW became responsible for the part that is outside the home owners property known as lateral drains as well as the public sewer.

11.3 Flood Risk Management

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

- Respond to flooding incidents involving their assets;
- Produce reports of the flooding 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 LLFA democratic process;
- Have a duty for the adoption of private sewers;
- Statutory consultee to the SAB (when enacted) when the drainage system is proposed to communicate with the public sewer.

11.4 Reducing Sewer Flooding

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

When sewage escapes from a pipe, through a manhole, drain or by backing up in a 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 failure 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 to SWW call centre on 0844 3462020 (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 as necessary. If assets are identified a job is raised and dispatched to their contractors. The advisors will tell you when you can expect the contractor 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 is 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 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.

11.5 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 the highway authority.

Currently, foul and surface water drainage from new developments can be connected to public sewers where available and water and sewerage companies have no powers to prevent new connections to its network even if it believes it could cause flooding to customers. For this reason SWW comments on planning applications even though they are not a statutory consultee.

However, this will be amended once the relevant section (Section 16 of Schedule 3) of the FWMA 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 SAB (to which SWW will be a statutory consultee). This will only apply to surface water, the right to connect will still apply to foul water.

11.6 Reservoir Undertaker

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

Section 12 - Powers and Responsibilities of Torbay's Citizens (Local Householders, Landowners and Businesses)

12.1 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 from 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 2 and 3 (areas at risk from coastal and 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 EA when the risk of river or coastal flooding is high. Refer to flood maps 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 warning direct service if coastal or river flooding 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 water 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 be connected to the foul sewer to be treated, otherwise watercourses and bathing waters can be polluted. Gutters and gulleys collecting rainwater should be connected 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.
- Report a flood incident to Torbay Council to help build up evidence for action to be taken.

The EA 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 from flooding. As detailed in the following link: <http://www.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.
- Campaign on behalf of flood risk communities and working with government and agencies to ensure that they develop a community perspective.

12.2 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 cases will need to discuss the method of doing this with the EA or the LLFA. They also have responsibility for maintaining the bed and banks of the watercourse and ensuring that there is no obstruction, diversion or pollution to the flow of the

watercourse. Full details can be found in the EA's document 'Living on the Edge: A guide to the rights and responsibilities of riverside ownership' which can be found at:

<http://www.environment-agency.gov.uk/homeandleisure/floods/3126.aspx>

Details of riparian rights and responsibilities can also be found on the Torbay Council website at:

<http://www.torbay.gov.uk/index/yourbay/environment/floodriskman/whoisresponsible.htm>

Section 13 – Other Utility Companies and Infrastructure Providers

13.1 Utility and Infrastructure Providers

Within Torbay most of the defence assets are the responsibility of Torbay Council 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 an 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 erosion risk and that the required level of service can be maintained in the event of an incident.

13.2 Reservoir Undertakers

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 10,000m³ must register their reservoirs with the EA 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.

Section 14 - Local Outcomes and Measures

14.1 Introduction

The following chapters of this strategy will set out the primary outcomes for Torbay Council for managing flood and coastal erosion risk in Torbay 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 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 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 timescale for delivery, which could include phasing over multiple flood risk management strategy cycles. It is important that all 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.

14.2 Torbay Council Strategic Outcomes

The outcomes should be in line with the guiding principles of the National Strategy and local strategy guidance 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 Torbay Council's Corporate Plan which sets out the Council's key priorities over the next three years (2013 – 2015). The Corporate Plan has produced outcomes and improvement activities, which have been assigned to the Engineering Section to be implemented.

Local strategy guidance state that high level outcomes should be developed around the reduction of potential adverse consequences of flooding for human health, the environment, cultural heritage and 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 the country.

It also suggests that the more detailed outcomes provide opportunities for the 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.

Torbay Council's outcomes for managing flood and coastal erosion risk in Torbay are listed below:

Ten Outcomes for Torbay Council:

1. To improve the understanding of local flood (surface water, groundwater and ordinary watercourse) and coastal risks.
2. Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change of 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.
10. Identify projects and programmes which are affordable, maximising capital funding from internal and external sources.

Torbay Council 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 the following table:

Outcome Number	Torbay Council Local Flood Risk Management Strategy Outcome	Four Overarching National Strategy Objectives				EA Key Headings			Long or Short Term
		Reducing consequences	Raising awareness & managing people	Providing an effective & sustained response	Prioritising Investment	Environmental	Social	Economic	
1	Improve understanding	Yes	Yes			Yes	Yes		Short
2	Increase awareness & preparedness	Yes	Yes	Yes		Yes	Yes	Yes	Short
3	Working together	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Short
4	Reduce impact and consequences	Yes		Yes	Yes	Yes	Yes	Yes	Long
5	Inform planning decisions	Yes	Yes			Yes	Yes	Yes	Short
6	Improve/maintain capacity of existing drainage	Yes		Yes	Yes	Yes	Yes	Yes	Short
7	Sustainable approach to flood risk management	Yes			Yes	Yes	Yes	Yes	Long
8	Approaches that utilise the natural environment	Yes		Yes		Yes	Yes		Short
9	Development of skills	Yes	Yes	Yes	Yes		Yes	Yes	Short
10	Funding sources	Yes		Yes	Yes	Yes	Yes	Yes	Short

Matrix to demonstrate the links between Torbay Council Local Strategy outcomes, National Strategy objectives and EA Key Headings

Short term outcomes 0 to 20 years

Long term outcomes 20 to 100 years

14.3 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 the following table.

Non-Structural Measures	Structural Measures
Flood Warning Systems	Flood walls
Public awareness and preparedness workshops	Flood embankments
Community engagement	Trash screens
Surface water management plans	Demountable flood barriers
	Flood storage features

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 of 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);
- Monitoring (of the local flood risk issues).

Where practical and when resources are available, Torbay Council would like to deliver the following measures for managing flood and coastal erosion risk in Torbay subject to funding from government.

1	To improve the understanding of local flood (surface water, groundwater and ordinary watercourse) and coastal risks
1.1	Record all flooding incidents and where appropriate carry out flooding investigations
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.
1.3	Develop a consistent approach to designation of flooding/drainage structures.
1.4	Identify and assess the condition of existing drainage assets within Torbay to prioritise capital investment.

1.5	Develop a standard press statement to be issued following a flood event.
1.6	Develop a bay wide map based record of flood risk assets, flood investigation reports, historical flooding and areas at risk from flooding to allow proactive risk management approach to be taken by the flood authority.
1.7	Create flood hazard and flood risk maps and flood risk management plans for areas within Torbay known to be at risk of significant flooding.
1.8	Update the Torbay Council Level 1 and Level 2 Strategic Flood Risk Assessments.

2	Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk
2.1	Raise public awareness of the impacts of climate change of flooding and (failure of) coastal defences.
2.2	Publish a public awareness strategy (workshop, public awareness events, update and improve the Council's website, adverts in local press) and communicate it.
2.3	Maintain/improve a flood incidents team (on call 24 hours) to deal with non-emergency flood incidents.
2.4	To collaborate with statutory bodies to promote the existing flood warning service (EA) and their proposed flooding campaigns.
2.5	Create an integrated Torbay wide real time hydraulic and flood alert map (long term).
2.6	Make the public aware of available flood prevention and mitigation measures (resistance and resilience) to protect their property and assets.
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.

3	To collaborate with Flood Risk Management Authorities, stakeholders and the public to reduce flood and coastal risks, and share data and resources to the greatest benefit
3.1	Identify responsibilities of the riparian owners of managing their assets, through public engagement.
3.2	Continue to meet with the South West Lead Local Flood Risk Management Authorities and coordination groups 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.
3.5	Introduce a process to carry out internal and external flood debrief meetings following a flood.

4	To reduce the impact and consequences for individuals, communities, business and the environment from flooding and coastal erosion
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.
4.5	Develop site specific flood response plans for those communities at high risk of flooding.

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
5.1	Develop a clear guidance for the planning department when assessing planning applications.
5.2	Develop a process within the planning department to create clear advice and direction to developers on flood risk management 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 Torbay.
5.5	Develop policies for effective land use management and enhance development control procedures where appropriate.

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 Torbay, to prioritise capital investment.
6.2	Develop a risk based reactive and cyclical maintenance regime.
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 Local Flood Risk Management Strategy are considered against the technical, economic and social benefits.
7.2	Consider the principles of the Torbay sustainability strategy in flood and coastal erosion risk management.
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.
8.4	Continue to implement Torbay Council's non culverting statement.

9	Ensure the development of skills required to implement effective and innovate flood risk management measures
9.1	Provide appropriate staffing levels and develop staff expertise to deliver the requirements of the FWMA.
9.2	Invest in appropriate software and hardware.
9.3	Outsource specialist skills, as required, to deliver specific projects.
9.4	Collaborate and provide support, training and network of staff across the South West of England.

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

Torbay Council 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 or short term. This matrix can be found in the following table.

Measure reference number	Local Flood Risk Management Strategy Measure	High Level Themes							Long, Medium Short Term	Struct. or non-struct.	Status Ongoing Pending Aspiration
		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 undertake flooding investigations		Yes		Yes	Yes		Yes	Short	NS	Ongoing
1.2	Record all appropriate structures/assets				Yes		Yes	Yes	Short	NS	Ongoing
1.3	Consistent approach to designation of structures				Yes				Short	NS	Pending
1.4	Identify and assess condition of assets/structures				Yes		Yes		Short	NS	Ongoing
1.5	Issue a press statement		Yes				Yes		Short	NS	Asp
1.6	Torbay wide flooding and drainage asset model		Yes		Yes		Yes	Yes	Long	NS	Asp
1.7	Flood hazard and flood risk maps	Yes	Yes	Yes		Yes	Yes		Short	NS	Asp
1.8	Update the Torbay Flood Risk Assessments					Yes	Yes	Yes	Short	NS	Pending
2.1	Raise public awareness						Yes		Short	NS	Ongoing
2.2	Publish a public awareness strategy & communicate it					Yes	Yes		Short	NS	Asp
2.3	Maintain/improve flood incident team		Yes						Short	NS	Ongoing

Measure reference number	Local Flood Risk Management Strategy Measure	High Level Themes							Long, Medium Short Term	Struct. or non-struct.	Status Ongoing Pending Aspiration
		Development planning & adaptation	Flood forecasting warning & response	Land, cultural & environmental management	Asset management & maintenance	Studies assessment & plans	High level awareness & engagement	Monitoring			
2.4	Collaborate with statutory bodies		Yes				Yes		Short	NS	Ongoing
2.5	Integrated Torbay wide real time hydraulic and flood alert map		Yes		Yes	Yes			Medium	NS/S	Asp
2.6	Public awareness of available flood prevention & mitigation measures	Yes		Yes			Yes		Short	NS	Ongoing
2.7	Target areas of historical flooding						Yes		Short	NS	Asp
3.1	Identify responsibilities of riparian owners			Yes	Yes		Yes		Short	NS	Pending
3.2	Continue to meet with other LFRMA's		Yes				Yes		Short	NS	Ongoing
3.3	Effective communication plan					Yes	Yes		Short	NS	Asp
3.4	Stakeholder engagement to identify responsibilities of flood risk partners						Yes		Short	NS	Ongoing
3.5	Internal and external debrief meetings following a flood	Yes	Yes		Yes		Yes		Short	NS	Ongoing
4.1	Identify vulnerable groups & prepare action plans					Yes	Yes		Short	NS	Asp

Measure reference number	Local Flood Risk Management Strategy Measure	High Level Themes							Long, Medium Short Term	Struct. or non-struct.	Status Ongoing Pending Aspiration
		Development planning & adaptation	Flood forecasting warning & response	Land, cultural & environmental management	Asset management & maintenance	Studies assessment & plans	High level awareness & engagement	Monitoring			
4.2	Identify areas at greatest flood risk, develop capital cost investment programme	Yes				Yes			Short	NS	Asp
4.3	Educate public on options for protecting their properties	Yes		Yes			Yes		Short	NS	Ongoing
4.4	Assist and provide support following a flood event		Yes						Short	NS	Asp
4.5	Develop site specific flood response plans	Yes	Yes			Yes	Yes		Short	NS	Ongoing
5.1	Guidance for planning department	Yes		Yes		Yes			Short	NS	Asp
5.2	Process to create clear advice and direction to developers	Yes		Yes		Yes			Short	NS	Asp
5.3	Establish a SuDS approval body	Yes		Yes					Short	NS	Pending
5.4	Keep the planning department informed and up to date with flood areas	Yes						Yes	Short	NS	Asp
5.5	Policies for effective land use management	Yes		Yes		Yes			Short	NS	Asp

Measure reference number	Local Flood Risk Management Strategy Measure	High Level Themes							Long, Medium Short Term	Struct. or non-struct.	Status Ongoing Pending Aspiration
		Development planning & adaptation	Flood forecasting warning & response	Land, cultural & environmental management	Asset management & maintenance	Studies assessment & plans	High level awareness & engagement	Monitoring			
6.1	Identify and assess condition of existing drainage assets				Yes	Yes			Short	NS	Ongoing
6.2	Risk based reactive & cyclical maintenance regime				Yes	Yes			Short	NS	Ongoing
6.3	Risk based programme for improving existing infrastructure			Yes	Yes	Yes			Short	NS	Asp
7.1	Consequences of implementing LFRMS considered			Yes					Short	NS	Ongoing
7.2	Work towards Torbay Council Sustainability Strategy	Yes		Yes			Yes		Short	NS	Ongoing
7.3	Consider using wetlands			Yes					Short	NS	Asp
8.1	Adopt natural flood risk management including SuDS	Yes		Yes					Short	NS/S	Pending
8.2	Keeping up to date with new and innovative technologies						Yes		Medium	NS	Asp
8.3	Where possible incorporate multiple benefits	Yes		Yes					Short	NS/S	Asp

Measure reference number	Local Flood Risk Management Strategy Measure	High Level Themes							Long, Medium Short Term	Struct. or non-struct.	Status Ongoing Pending Aspiration
		Development planning & adaptation	Flood forecasting warning & response	Land, cultural & environmental management	Asset management & maintenance	Studies assessment & plans	High level awareness & engagement	Monitoring			
8.4	Implement Torbay Council's non-culverting statement	Yes		Yes					Short	NS	Ongoing
9.1	Provide enough staff to deliver the requirements of the FWMA								Short	NS	Ongoing
9.2	Invest in appropriate software and hardware		Yes						Short	NS	Ongoing
9.3	Outsource specialist skills to deliver specific projects								Short	NS	Ongoing
9.4	Staff support, training and networks						Yes		Short	NS	Ongoing
10.1	Identify potential funding sources								Short	NS	Ongoing
10.2	Lifecycle cost benefit analysis			Yes		Yes			Short	NS	Ongoing
10.3	Investigate opportunities for match funding and grants								Short	NS	Ongoing

Matrix to demonstrate the links between Torbay Council's Local Flood Risk Management Strategy measures and local strategy guidance and high level themes

Notes:

Yes means measure supports the theme

Blank means measure is not applicable to the theme

Short term measures will be undertaken between years 0 and 20.

Medium term measures will be undertaken between years 20 and 50.

Long term measures will be undertaken between years 50 and 100.

Ongoing means measures that are already carried out by Torbay Council and will continue to be carried out.

Pending means measures that Torbay Council are required to do under the FWMA.

Aspirational means measures that are not required but would be beneficial if implemented.

14.4 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 recommendations. The definition of working with natural processes taken from this report is reproduced 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, reinstating wash lands and wetlands to store water away from high risk areas or allowing cliffs to erode to provide sediment down drift.'

In the context of flood and coastal erosion risk management, working with natural process often means slowing down the flow of water (e.g. by re-establishing flood plains that hold flood water) 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 storing and improved water quality. Natural processes operate across a continuum from mitigated engineering to full naturalisation (See Figure 14.1 below).

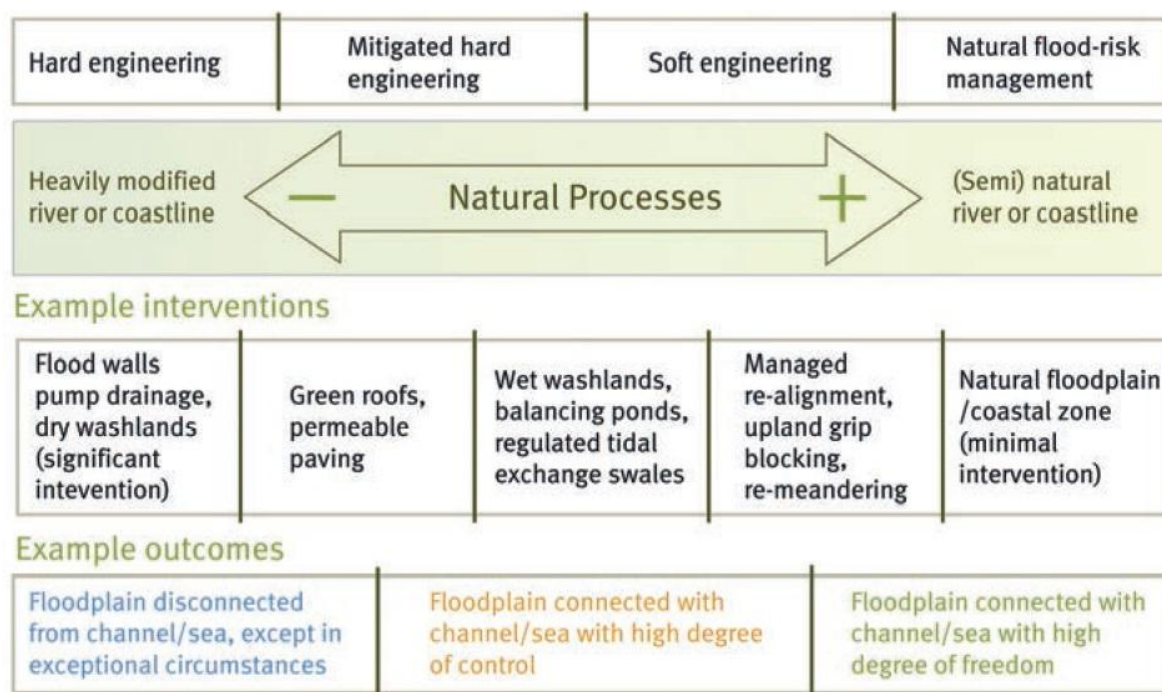


Figure 14.1 The Environment Agency conceptual model of working with natural processes.

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 store water within a buildings own footprint. These interventions slow down and absorb surface water run off and can create valuable habitats for wildlife whilst reducing flood risk to developments.

Section 15 - Funding and Delivery

15.1 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 within existing Council resources but others will require external funding support. Torbay Council must identify what funding sources are currently available 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 central government in the form of the revenue support grant (RSG). It is essential for the implementation of the strategy and for all statutory duties mentioned that the funding settlement from central government to Torbay Council identifies an allocation to flood risk management. The statutory duties outlined previously, will require ongoing funding from the Torbay Council RSG from 2014 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 six years.
- Maintain and update the asset register,
- Designation of structures and features that affect flood and coastal erosion risk,
- Continue and improve the investigation of floods,
- Continue consenting works on 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 six years,
- Community awareness activities associated with duties of the local strategy.

15.2 Current Funding Sources

At present Torbay Council receives funding from central government in two ways:

- A non-hypothecated grant (which can be used by the authorities for any purpose they choose in delivering the service for which they are

responsible). An annual and unpredictable amount provided through the RSG; and

- A hypothetical 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 on a scheme by scheme basis. Currently FDGiA is allocated based on outcome measures and a partnership funding score. It is extremely unlikely that any scheme will receive 100% FDGiA funding and therefore partnership funding from an alternative source will be required.

Source of Funding	Description	Indicative Budget	Admin. By	To Fund
FCERM Revenue Support Grant (RSG)	Annual funding to support each LLFA will be provided through the RSG system	£120k	Torbay 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)	Central Government/EA funding for flood alleviation and coastal erosion measures 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	EA	Medium to large capital FRMC projects.
Private Contributions	Voluntary from the private sector and local communities. Funding from beneficiaries of projects could make contributions from national funding viable. Contributions may be financial or in kind e.g. land, volunteer labour	Unknown	Torbay Council	All projects
Water Company Investment	Investment heavily regulated by Ofwat but opportunities for contributions to area wide projects which help address sewer under capacity problems.	Unknown	SWW	Projects which help to remove surface water from combined sewers.
SAB Income	It is anticipated that Torbay Council will receive application and	Unknown	Torbay Council	Development drainage approval and FRM issues

	inspection fees funded by developers in support of the approval and inspections of new development related SuDS. Funding of long-term maintenance of SuDs is currently unclear, although a range of solutions is available.			
Local Fundraising	An important funding mechanism will come from local fundraising from the local communities and businesses that benefit from the proposed flood defence scheme.	Unknown	Torbay 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	Torbay Council	Measures which address flood risk to riparian owners
Section 106 contributions (Town & Country Planning Act)	It is anticipated that Torbay Council 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.	Unknown	Torbay Council	Large development sites
Community Infrastructure Levy (CIL)	A local levy applied by the planning department 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. Torbay Council has not yet	Unknown	Torbay Council	All measures outlined in the strategy

	implemented the CIL scheme. A bid for CIL would have to be made for flood management/drainage improvements against other competing council priorities.			
Business rates supplements	Agreement from local businesses to raise rates for specified purposes.	Unknown	Torbay Council	Measures which address flood risk to businesses
Collaborative schemes with other risk management authorities	There are opportunities for collaborative schemes with other Risk Management Authorities, although SWW have limited scope for 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	Torbay Council	Key measures in the strategy
Structural Funds Programme 2013 – 2020	Structural funds – potentially around climate change adaptation, risk prevention and management.	Unknown	Torbay Council	Potentially medium to large capital projects
Defra	Other funding is being provided by Defra to help some individual homeowners to pay for costs of installing individual property flood resilience measures in areas that are frequently flooded and do not benefit from community defences.	Unknown	Torbay Council	Installing individual property flood resilience measures
Collaborative working with other bodies on Research & Development	There are opportunities for collaborative working with Universities, the Environment Agency, Defra and other institutions on research and development into flooding issues and flood prevention measures. Early discussions and involvement with these bodies may benefit all parties and the community.	Unknown	Torbay Council	Measures that address flood risk to both residential properties and businesses

Section 16 - Contribution to Wider Environmental Objectives

16.1 Introduction

The main purpose of this report is to set out the strategy for implementing flood risk management measures across Torbay. However there is an opportunity to derive significant benefit in the process, in respect to aspirations in the wider context of sustainability, environment 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 improvement 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 targeting maintenance,
- Establish a SuDS approval body (SAB),
- The Torbay SAB will embrace 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 risk 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 upward trends of pollutants in groundwater,
 - 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 within Torbay. 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 SSSI's,
- Ensure no loss or degradation of habitat through flood risk management works to comply with the Biodiversity Action Plan (BAP). As a flood authority, Torbay Council has a duty (under Section 40 (1) of the Natural Environment and Rural Communities Act 2006) to conserve biodiversity within Torbay,
- Ensure the environmental consequences of implementing the Local Flood Risk Management Strategy are considered against technical, economic and social benefits,

16.2 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 22nd December 2000 and was transposed into UK law in 2003 via the Water Environment (Water Framework Directives) (England and Wales) Regulations 2003⁶¹. 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,
- Contribute to mitigating the effects of floods and droughts.

The WFD 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 EA produced a number of River Basin Management Plans, 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.

Section 17 - Reviewing the Strategy

The strategy will provide the framework for Torbay's delivery of its flood risk management responsibilities and aspirations. Torbay Council's Engineering Section will review the strategy on a regular basis with assistance from other sections to monitor progression on the implementation of the measures. The sections of the Council involved will include but not exclusively: Emergency Planning, Highways, Planning and Legal.

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 Torbay. Torbay Council 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 flood risk management measures across the Bay. It is anticipated that the strategy will become more focused on the delivery of an affordable and funded capital programme on flood risk management 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 PFRA 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 the first annual action plan to implement the strategy	February 2015 and every year thereafter
Publication of flood hazard and flood risk maps for Torbay	December 2014 and 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 and each six years thereafter (where appropriate)
Publication of the second National Flood Risk Management Strategy	2016
Review and update the Torbay Council Flood Risk Assessment	Spring 2017 and each six years thereafter
Complete first formal review of the Torbay Council Local Flood Risk Management Strategy	December 2017 and each six years thereafter (or where appropriate)

Section 18 Glossary of Terms and Abbreviations

The following table contains a glossary of terms and abbreviations commonly used in flood and coastal erosion risk management.

Term	Meaning or 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.
BAP	Biodiversity Action Plan
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 safety and health for people in and around these buildings, but also for the purpose of energy conservation and access to and about other buildings.
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.
Coastal Erosion	The wearing away of the 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 the risk of the wearing away of the 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.
Combination Flooding Event	Any number or all sources of flooding (surface water run-off, fluvial, groundwater, sewer, highway, reservoir or coastal)

	come together to produce what is known as a combination event.
Community Infrastructure Levy (CIL)	A mechanism for raising additional funding at the local level.
Consenting	Process for obtaining permission to add/amend structures in/near a watercourse
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 divert 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, riverbed or flood plain.
DG	Director General – the professional head of an executive agency.
DG5	DG5 Register is a register of properties and areas that have suffered flooding from public foul, combined or surface water sewers due to overloading of the sewer system.
Draft Bill	A Bill published in draft before introduction before Parliament.
EA	Environment Agency – Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs.
EC	European Commission
EU	European Union
Flood	Any case where land not normally covered with water becomes covered by water.
FCERM	Flood and Coastal Erosion Risk Management
FDGiA	Flood Defence Grant in Aid.
Flood Risk	Product of the probability of flooding occurring and the consequences when flooding happens.
Flood Risk Management (FRM)	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 risk is to be managed.
FRR	Flood Risk Regulations 2009.
Floodline Warning Direct	Is a free service that provides flood warnings direct to you by telephone, email, SMS text message or 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.
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
LFRMS	Local Flood Risk Management Strategy – Required under the Flood and Water Management Act 2010, Local Flood Risk Management 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 – Defined under the Flood and Water Management Act as either the Unitary Authority or the County Council for the area (Local Authority).
Living on the Edge	An Environment Agency guide to the rights and responsibilities of riverside ownership.
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.
Local Flood Risk	Defined within the Flood and Water Management Act 2010 as including surface run-off, groundwater and ordinary watercourse.
Main River	A watercourse shown as such on the Main River Map, 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.
National Strategy	Under the Flood and Water Management Act 2010 the Environment Agency were required to produce a National Flood and Coastal Erosion Risk Management Strategy which identifies a framework for flood and coastal erosion risk management.
NERC	Natural Environment and Rural Communities Act 2006.
NRA	National Rivers Authority which became the Environment Agency on 1 st April 1996 following the Environment Act 1995 receiving Royal Assent.
NPPF	National Planning Policy Framework – Document that rationales the planning r legislation.
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 nor designated Main River, and which are the responsibility of riparian landowners.
Pitt Review	A review into the widespread flooding in summer 2007

	undertaken by Sir Michael Pitt. The final report was published in June 2008.
PPG25	Planning Policy Guidance 25 – Policy relating to development in areas of flood risk in England. Superseded by PPS25
PPS25	Planning Policy Statement 25 – Planning relating to development in areas of flood risk in England. Superseded by NPPF.
PFRA	Preliminary Flood Risk Assessment.
Recovery	The process of rebuilding, restoring and rehabilitating the community following an emergency.
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
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.
RFCC	Regional Flood and Coastal Committee – Torbay is part of the Devon & Cornwall Regional Flood & Coastal Committee.
Riparian Ownership	Landowners, householders and businesses whose property is adjacent to a river or watercourse or stream or ditch are likely to be riparian owners with responsibilities for maintaining the bed and banks of the river, watercourse, stream or ditch.
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 Risk Management Authority is defined under the Flood and Water Management Act 2010 as the Environment Agency, a Lead Local Flood Authority, a district council for an area where there is no unitary authority, an Inland Drainage Board and a water company.
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 Acts of Parliament.
RSG	Revenue Support Grant

SAB	Sustainable drainage approval body. Following commencement of Schedule 3 of the Flood and Water Management Act 2010 the Lead Local Flood Authority for the area will become the SAB.
Sewer	An artificial conduit, usually underground, for carrying off sewage (foul sewer) or rainwater (storm or surface water sewer) or both (combined).
SEA	Strategic Environmental Assessment. An SEA is a system of incorporating environmental considerations into policies, plans, programmes and strategies.
SFRA	Strategic Flood Risk Assessment.
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.
SSSI	Sites of Special Scientific Interest
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 run-off rates exceed the capacity of the drainage systems to remove it. In the rural context, it is where surface water run-off floods something or someone.
Surface Water Run-off	This occurs when the rate of rainfall exceeds the rate that water can infiltrate into the ground or exceed the capacity of the drainage system and flows over ground.
SWMP	Surface Water Management Plans.
SWW	South West Water – The water and sewerage company for Torbay.
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.
Watercourse	A channel natural or otherwise along which water flows.
WFD	Water Framework Directive

Appendix A

Plan of Main Rivers & Ordinary Watercourses in Torbay