



Flood Resilience Guide



Useful information to help you protect your home
or business from the risks of flooding



Contents

Introduction	3
A local story - Mr and Mrs W in County Durham	4
Flood insurance cover	5
What are the main flooding risks?	7
Finding out if your home is at risk from flooding	10
Do I need to consider protecting my home from flooding?	11
What are the best ways to protect my family and home from flooding? ..	12
Flood Plan/Household Emergency Plan	16
Know your warnings	17
Flood protection products	18
Managing the county's flood risk	26



Introduction

Water is an essential part of our everyday lives, but the effects of too much water where we don't want it can be devastating.

Flooding is a risk that must be respected by everyone, no matter where they live. Flooding can be caused by water from rivers, rain, groundwater flooding (that comes up to the surface), surface water flooding (where water runs over the land) or even from blocked or broken pipes and drains. It can affect many parts of our day to day lives; including our homes, businesses, schools, transport networks and utilities suppliers.

It is therefore essential that we respect the risk and plan ahead so we are prepared for flooding if and when it happens.



A local story - Mr and Mrs W in County Durham

Unfortunately our experience of flooding has been by learning lessons through bitter experience.

When we bought our house we asked local friends if the area was ever affected by severe weather or flooding, but this had not been an issue in the area for many years.

We had been living in the house for several years when we experienced a limited amount of flooding in the year 2000 and so carried out a small amount of work to try and prevent future damage. We were told that the flooding had been judged to be about a one in a hundred year event, so we took some small actions like blocking up holes in walls. We also installed a sump in the kitchen which we could use to pump out small amounts of water plus some home-made door barriers.

All of these arrangements were totally inadequate when we flooded again in 2012. The Environment Agency said it was "an extreme event" with less than a 1% chance of occurring in a given year.

The flooding within our house was severe. At the time we had wooden floors throughout the property and these were totally ruined and had to be replaced.

Our insurance company were fairly accommodating in how we

could spend the money we received for the damage on replacement items, and this allowed us to make purchases that included flood resilience measures where possible. This included replacing the wooden floors with tiles as they are more resilient to flooding. We also extended the amount of tiling up behind kitchen units. All of the plasterwork that needed replacing was completed with water resistant materials and all electrical sockets and wiring was raised high on the walls, above the high water line of the previous flooding.

After we had returned to our property (after living with relatives for some time) we decided to look into ways of reducing the probability of water entering the house. This included buying barriers (from suppliers whose products are BSI kite marked). A variety of barriers were required for the different doorways. We also installed a system to prevent water from the sewers flowing back up through the drains.

We sincerely hope that our property does not get flooded again but if that does happen, we are optimistic that the measures we have taken will minimise the impact. We would recommend to anyone that they take the issue of flooding seriously; to properly investigate their risk and to take appropriate measures, as the consequences of not doing so can be devastating.



Flood insurance cover

If your property has suffered from flood damage in the past, if there is a history of flooding in your neighbourhood or you are within an identified flood risk area, it can sometimes be difficult to find insurance cover.

In most cases, flood insurance is part of your buildings and contents insurance. Insurance premiums and terms and conditions reflect an insurer's assessment of the likely incidence and severity of the flooding. Areas at risk of flooding may therefore have higher premiums and excesses (the amount you must pay towards the costs of repair) to reflect that risk.

An insurance company may ask you for an Insurance Related Request (IRR) Letter if your property is at risk of flooding. The insurer will use the letter to decide if they'll insure you and how much it will cost.

The letter from the Environment Agency will include:

1. If your property is in a flood risk area
2. How likely the area is to flood
3. The protection given by local flood defences
4. If there are any planned flood defences

This letter is free for individuals and £60 for businesses. To find out more or request a letter, email: [**northeast-newcastle@environment-agency.gov.uk**](mailto:northeast-newcastle@environment-agency.gov.uk).

Insurers do not guarantee to provide cover in all circumstances and some insurers may consider your risk to be unacceptable to them.

Flood insurance cover

If it has not been possible to obtain affordable cover through a standard insurance provider, there are possible sources of help:



The British Insurance Brokers' Association (BIBA)'s 'find a broker' helpline can help you locate a flood specialist insurance broker. Visit www.biba.org.uk or call **0870 950 1790**.



The National Flood Forum provides independent advice on how to approach getting flood risk insurance. Visit www.floodforum.org.uk or call **01299 403 055**.

How can being prepared for flooding help with insurance cover?

Ensuring you have measures in place to avoid the need to claim or by reducing your risk of making a claim, can help you to maintain access to mainstream insurance. In the event that you need to deal with a specialist insurance company, they will take into account any measures you put in place to reduce the effects of flooding.



What are the main flooding risks?

Your home may be at risk from flooding due to a number of factors that need to be considered. The main flood risks are:



Surface water flooding

Surface water flooding is often the result of extended periods of rain or sudden heavy downpours. The ground may be saturated and the drains and sewers which carry away surface water may not be able to cope or could become blocked with debris. The accumulated surface water will naturally flow to the lowest point and collect in low lying areas.

For incidents of surface water flooding in County Durham contact Durham County Council Customer Services: 03000 21 1000.



Groundwater flooding

This is very similar to surface water flooding and generally occurs during long and intense periods of rainfall when the level of water soaking into the ground raises the level of the water table until it exceeds ground levels. It is more common in low lying areas with porous soils and rocks or in areas where there is a natural high water table. Buildings with basements or cellars are the most at risk from ground water flooding.

For incidents of groundwater flooding in County Durham contact Durham County Council Customer Services: 03000 21 1000.

What are the main flooding risks?



River flooding

River flooding usually occurs after heavy rainfall although can occur following snow melt where the normal river channel is unable to carry the resulting high flow of water. Any properties built on historical flood plains or low lying land adjacent to rivers are at risk from river flooding, for example properties that line the banks of the River Wear in Durham City. River flooding can extend over large areas, cause widespread damage and is often slow to drain away. Any fast flowing floodwaters pose significant risks to the structure of a building.

For incidents of river flooding contact the Environment Agency Floodline: 0345 988 1188 or 0845 988 1188.

Coastal and tidal flooding

This is caused by high tides coinciding with a low pressure storm system which raises sea and tidal waters to a level that can breach coastal defences. Strong winds blowing sea water onto the coast can increase the risk of flooding. Coastal flooding can also affect properties further inland if the property is built in a tidal river basin as the flood water can be forced up the tidal reaches of rivers.

County Durham possesses a varied coastline about thirteen miles in length, consisting of shallow bays and headlands, plus yellow limestone cliffs up to 30 metres in height. It is relatively unpopulated and together with the natural defences of high cliffs, coastal flooding affecting people in County Durham is unlikely.

For incidents of coastal flooding in County Durham contact Durham County Council Customer Services: 03000 21 1000.

What are the main flooding risks?

Reservoir or dam failure

Reservoir or dam failures are uncommon, so whilst the consequences of such a failure could be catastrophic and affect a large area, the actual chances of this happening are remote. All reservoirs larger than 10,000 cubic metres must be registered with the Environment Agency and are regularly inspected to ensure their safety.

For incidents of reservoir leaks contact the reservoir owner. If you don't know who this is, dial 999 and ask to speak to the Fire & Rescue Service or Police.

Burst water mains

A burst water main can release a large volume of water that may flood a street and potentially enter properties in the vicinity of the burst. Whilst this type of flooding is likely to be short lived, damage can still occur in basements, cellars or ground floors.

For incidents of burst water mains in County Durham contact Northumbrian Water: 0800 393 084.

Sewer flooding

Sewer flooding can be caused by a blockage in a sewer pipe, equipment failure or too much water entering the sewers from storm drains following extended rain or sudden downpours. Sewer flooding poses a very real health risk which is why it is always best to keep out of flood water in general as there is often the risk of contamination from sewerage.

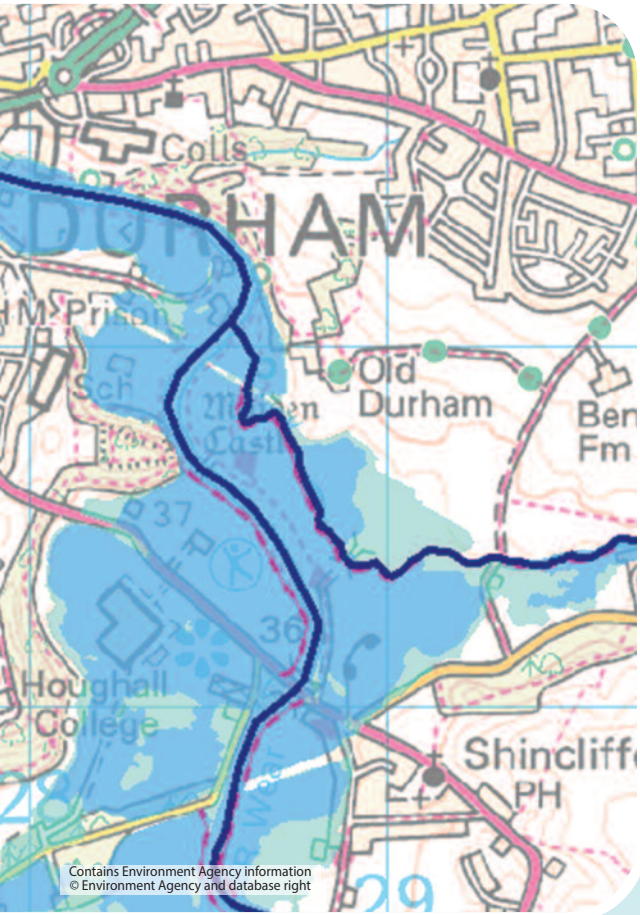
For incidents of sewer flooding in County Durham contact Northumbrian Water: 0800 328 7648.

Finding out if your home is at risk from flooding

One of the quickest and easiest checks to do to find out if your home is at risk from river or coastal flooding is to check the **Flood Maps** held on the **Environment Agency website**: www.gov.uk/prepare-for-a-flood/find-out-if-youre-at-risk. These maps are intended to be a general guide only and do not specify individual properties.

Local knowledge of an area can be an important source of information, why not ask neighbours about any history of flooding in the area? Durham County Council holds information on flooding in the **Strategic Flood Risk Assessment (contact spatialpolicy@durham.gov.uk)**. The local water company (**Northumbrian Water**) may also hold flood records.

Alternatively you may wish to employ the service of **specialist consultants** who for a fee will assess the risks of different types of flooding for a specific property.



Do I need to consider protecting my home from flooding?

If having checked on the Environment Agency website you discover your property is at risk of flooding then you may wish to consider whether or not to protect your home.

As a minimum, you should consider making a Flood Plan.

If your property has flooded on a previous occasion, then you should consider having a Flood Plan plus consider some appropriate flood protection measures.

If the risk to your home is high, for example if your property has flooded more than once in the last ten years, you will need a Flood Plan together with the appropriate flood protection measures, in order to maintain insurance cover. Having flood

protection measures in place will also help to minimise any negative impact there may be on the market value of your property.

Areas at risk of flooding from rivers or the sea are designated in either Floodzones 1, 2 or 3, depending on the risk.

For more information on Flood Plans, see page 16 of this guide.





What are the best ways to protect my family and home from flooding?

To keep you and your family safe and to choose the best option for protecting your home, you are going to need some facts about the flood risk and facts about the vulnerability of your house.

The more reliable the facts then the more certain you can be that you have chosen the best option. Factors that influence the best choice of flood protection are discussed in the following pages of this guide. You should however, be aware that many of the important facts can be difficult to establish and require technical knowledge and experience to make reliable estimates. You should obtain specialist advice from surveyors with flood risk experience or specialised flood risk consultants. The area at risk of flooding should be identified and the mechanism of flooding determined, such as the source of flooding (for example rivers, seas, reservoirs, groundwater, surface water, sewers and mains supply) and the pathways that water will take to reach the site.

What are the best ways to protect my family and home from flooding?

Facts about the flood risk

There are four facts about flood water that are of particular importance:



Flood depths expected at your house.

Low depths can cause significant water damage to buildings and contents that do not have flood protection. High water depths, for example 1m, may severely threaten the safety of people and may cause extensive damage to buildings. It may be dangerous to keep deep floods out of a building because of the large weight of water pressing against the walls.

Remember that any flood water could be contaminated, while fast flowing water can be very dangerous even if it appears shallow.



Flood duration is the time that flood water is expected to stay at your house. Temporary flood defences may successfully keep water out if flooding is expected to last for just a couple of hours,

but during long flood durations may give time for water to penetrate into the building. Take refuge and stay in a building for short duration floods but this will depend on the other factors.

Flood onset is the time for flood water to reach your house from its source. Short onset flooding (flash floods) are particularly dangerous as there is little time available to get people to safety or to protect buildings. Incidents of flash flooding have affected numerous areas of County Durham.





Flood annual probability is a measure of the chance of flooding to your house over the course of one year. Different approaches to flood protection may be needed depending upon how likely flooding is.

Knowing the four key factors can help you to decide what you and your family should do when flooding strikes, for example 'evacuation' or 'go-in, stay-in and tune-in'. These factors are also a good guide as to the best way to protect your home from flooding. The expected velocity of flood water is an important factor that can have an impact on the flood risk at your home. Rapidly flowing water at even low depths increases the risk to people and property. The effect of flood defences should also be taken into account when estimating the above factors. Sources of information for the important factors include the



Environment Agency and local library archives. Local knowledge, particularly from long-standing residents, is invaluable. Specialist help should be sought for calculating things like rainfall, river flows, pipe capacities and measurements of ground levels to make reliable estimates based on the four key factors.

The magnitude (or severity) of the flooding can be very important. Shorter floods that are more severe have a lower chance of occurring but a higher risk of causing damage.

What are the best ways to protect my family and home from flooding?

Property Level Flood Protection Survey

A property level flood protection survey should establish facts such as the level of thresholds and floors, the likely points of water entry, whether attempts should be made to keep water out of your house or just to allow the water in and enhance the building in such a way as to limit the damage and promote rapid clean up. The property level flood protection survey of your house should be performed by an experienced professional.

The Environment Agency (EA) has just published a new standard template for surveying property-level flood protection risk. It is the culmination of a project led by Defra and the Environment Agency and in partnership with Association of British Insurers, British Institution of Insurance Brokers and the National Flood Forum.

The documents can be found at:

[www.gov.uk/prepare-for-a-flood/
get-insurance](http://www.gov.uk/prepare-for-a-flood/get-insurance)

The link will take you to an EA web page which includes a short explanation and link to the report. This will give surveyors a recognised framework for assessing flood risk and will help people set out the flood risk information that insurers may ask them to provide. This offers a way of encouraging insurers to accept good property level protection schemes as a way of mitigating insurance premiums, and therefore making insurance more available and affordable.



Flood Plan/Household Emergency Plan

Having a Flood Plan or a Household Emergency Plan will enable you and your family to be prepared for an emergency which will help to reduce the risk to you and your family as well as potentially limit the damage to your property. Your plan will need to establish the best emergency actions and who does what when flooding looks likely.

Key tasks in making a flood plan include:

1. Know who you are going to contact (friends and family) in a flood and how
2. Think about what you can move now (don't wait for a flood to move valuables to safety)
3. Make a list of what you would want to move to safety during a flood, including possessions, animals or objects (don't forget to consider vulnerable neighbours)
4. Check your insurance cover, make sure its suitable for your needs
5. Know how to turn off your water, gas and electricity mains supplies
6. Make a flood kit of essential items and keep it handy





Know your warnings

If you live in an area prone to river or coastal flooding then it would be advisable to check with the Environment Agency to see if your property is covered by the Floodline Warnings Direct service. This is a free service which sends a direct message by telephone, mobile, email or SMS text message when flooding is expected that may affect your property. Being aware of flood warnings may give you time to prepare for flooding.

For more information on Floodline Warnings dial 0845 988 1188.

Information on how to sign up for free to Floodline Warnings Direct can also be found at:

www.gov.uk/sign-up-for-flood-warnings



Flood Alert



Flood Warning



Severe Flood Warning

Another useful warning system that can be used in conjunction with Flood Alerts is the **National Severe Weather Warning Service** provided by the Met Office. All warnings and alerts for this service appear on the Met Office website:

www.metoffice.gov.uk

The Environment Agency provides a guide for preparing a Flood Plan.

A Flood Plan template can be found on their website:

www.gov.uk/prepare-for-a-flood/make-a-flood-plan



Flood protection products

Flood protection products are designed to keep water out of your property. Temporary flood protection products are those

that need to be fitted or activated before the flooding arrives. A permanent flood protection product does not need activating but remains in place at all times. Measures that reduce flood damage to buildings in situations where water is allowed to enter the building are referred to as flood resilience products.

Establishing your flood risk and facts about your home will help to guide you to the best choice of flood product whether this is a temporary, permanent or a flood resilience product. It is important to remember that the chosen flood protection products will only be effective if used

correctly. It is important to ensure that any flood protection products should be maintained and where relevant, stored correctly in order to ensure their long term effectiveness.

There are numerous ways to improve the defences of your property against flooding. These range from permanent alterations to products you can make use of on a temporary basis.




There are many sources on how flood protection products work; a good place to start is on the Environment Agency website:

www.gov.uk/prepare-for-a-flood/improve-your-property-flood-protection

Look out for the logo of products approved by the British Standards Institute (BSI).



Permanent flood protection - permanent measures to consider

Product	Advantages	Disadvantages
 <p data-bbox="363 281 580 356">Raised threshold or porch</p>	<ul data-bbox="628 281 863 381" style="list-style-type: none"><li data-bbox="628 281 823 314">• Unobtrusive<li data-bbox="628 348 863 381">• Multifunctional	<ul data-bbox="948 281 1273 381" style="list-style-type: none"><li data-bbox="948 281 1273 314">• Low flood water depth<li data-bbox="948 348 1182 381">• Disabled access
 <p data-bbox="363 437 533 544">Passive flood barriers / auto-barriers</p>	<ul data-bbox="628 437 884 538" style="list-style-type: none"><li data-bbox="628 437 823 471">• Unobtrusive<li data-bbox="628 505 884 538">• High flood depth	<ul data-bbox="948 437 1406 645" style="list-style-type: none"><li data-bbox="948 437 1182 471">• High initial cost<li data-bbox="948 505 1235 538">• Below ground work<li data-bbox="948 572 1406 645">• May need extra measures to deal with seepage
 <p data-bbox="363 689 555 757">Flood / water resistant doors</p>	<ul data-bbox="628 689 823 723" style="list-style-type: none"><li data-bbox="628 689 823 723">• Unobtrusive	<ul data-bbox="948 689 1417 969" style="list-style-type: none"><li data-bbox="948 689 1406 762">• May need extra measures to deal with seepage<li data-bbox="948 796 1417 869">• Could hinder evacuation if people are inside with rising water<li data-bbox="948 897 1417 969">• If flood water is deep, could cause structural problems

Permanent flood protection - additional measures

Actions	Advantages	Disadvantages
Covering weep holes	<ul style="list-style-type: none"> • Unobtrusive • Low cost 	<ul style="list-style-type: none"> • May cause damp problems if permanently covered
Facing bricks	<ul style="list-style-type: none"> • More effective than sealing an existing wall 	<ul style="list-style-type: none"> • Below ground work • May need planning approval • May only reduce penetration rate
Rendering	<ul style="list-style-type: none"> • Should seal cracks even on poor walls 	<ul style="list-style-type: none"> • May need planning approval • May only reduce penetration rate • May need to be done in conjunction with facing bricks • May lead to damp within the walls
Wall sealant	<ul style="list-style-type: none"> • Unobtrusive • Low cost • Easy application 	<ul style="list-style-type: none"> • May only reduce penetration rate • Brickwork needs to be in good condition for the best effect • May lead to damp within the walls
Permanent wall barrier	<ul style="list-style-type: none"> • Can use glass to minimise visual impact and allow light through • Wood effect to mimic a fence 	<ul style="list-style-type: none"> • High cost • Careful design and construction • May need extra measures to deal with seepage

Permanent flood protection - additional measures

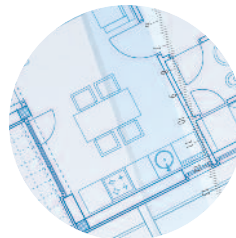
Actions	Advantages	Disadvantages
Tanking	<ul style="list-style-type: none"> • Designed to be completely waterproof • Protection against groundwater flooding • Usually comes with guarantee 	<ul style="list-style-type: none"> • High cost • Requires sump and pump • Only effective primarily against groundwater flooding
(Permanent) Water-resisting airbricks	<ul style="list-style-type: none"> • Low cost • Unobtrusive 	<ul style="list-style-type: none"> • Careful installation and maintenance • May need measures to deal with seepage
Sealant around external doors / windows	<ul style="list-style-type: none"> • Unobtrusive • Low cost 	<ul style="list-style-type: none"> • Careful application • No quality standard • Relies on waterproof doors/windows • Seepage possible
Seal around service entry points	<ul style="list-style-type: none"> • Unobtrusive • Low cost 	
Non-return valves for wastewater pipes and washing machine outlets	<ul style="list-style-type: none"> • Unobtrusive • Low cost • Easy fit 	<ul style="list-style-type: none"> • Could impact on neighbours

Permanent flood protection - additional measures




Actions	Advantages	Disadvantages
Raised kitchen appliances		<ul style="list-style-type: none"> • There is a practical limit to how high appliances can be raised • There are still cleaning and drying costs following a flood
Raised utilities		<ul style="list-style-type: none"> • There is a practical limit to how high electrics can be raised
Bolt-down inspection covers	<ul style="list-style-type: none"> • Low cost 	
Appliance vent covers (tumble dryer wall vents)	<ul style="list-style-type: none"> • Low cost 	<ul style="list-style-type: none"> • Sufficient warning to allow deployment
Pipe bungs	<ul style="list-style-type: none"> • Low cost 	<ul style="list-style-type: none"> • Sufficient warning to allow deployment
Flood alarm	<ul style="list-style-type: none"> • Can be used where there are no formal flood warning service • 24/7 monitoring 	<ul style="list-style-type: none"> • Regular testing and maintenance • May need landowner/local authority permission
Water compatible internal walls and floors		<ul style="list-style-type: none"> • Double the cost of traditional gypsum/plasterboard (walls) • Cleaning and drying costs still apply • Only cost effective to replace existing as part of flood damage repair

Permanent flood protection - additional measures

Actions	Advantages	Disadvantages
Water compatible kitchen/bathroom appliances and fixtures		<ul style="list-style-type: none"> • Cleaning and drying costs still apply • Only cost effective to replace existing as part of flood damage repair
Water compatible woodwork	<ul style="list-style-type: none"> • Low cost 	<ul style="list-style-type: none"> • Cleaning and drying costs still apply • Only cost effective to replace existing as part of flood damage repair
Water compatible stairs		<ul style="list-style-type: none"> • Double the cost of traditional stairs • Cleaning and drying costs still apply • Only cost effective to replace existing as part of flood damage repair



Temporary flood protection products

Product	Advantages	Disadvantages
 <p>Door / window barriers</p>	<ul style="list-style-type: none"> • Low cost • Quick deployment • Lightweight products available • Large choice (BSi PAS 1188-1) 	<ul style="list-style-type: none"> • Require storage • Some barriers need tools for deployment • Permanent fixings on building • May need measures to deal with seepage • Need sufficient warning to allow deployment
 <p>Sandbags / aqua-sacs</p>	<ul style="list-style-type: none"> • Low cost 	<ul style="list-style-type: none"> • Storage • Used bags need to be disposed
 <p>Airbrick covers (temporary)</p>	<ul style="list-style-type: none"> • Low cost 	<ul style="list-style-type: none"> • Need sufficient warning to allow deployment • Storage • May need extra measures to deal with seepage

Temporary flood protection - additional actions



Actions	Advantages	Disadvantages
Removable fixtures and fittings	<ul style="list-style-type: none">• Low cost• Rapid deployment	<ul style="list-style-type: none">• Requires occupant to maintain and deploy
Relocate valuables	<ul style="list-style-type: none">• No cost• Rapid deployment	<ul style="list-style-type: none">• Requires occupant to deploy• Large items may be difficult to move
Sump and pump	<ul style="list-style-type: none">• Rapid deployment• Relatively low cost• Helps where a resistance product leaks• Can remove flood water in an emergency	<ul style="list-style-type: none">• Must be positioned and sized correctly• May require ancillary power supply• Will need servicing and maintenance
Toilet plugs	<ul style="list-style-type: none">• Low cost• No permanent installation required	<ul style="list-style-type: none">• Sufficient warning to allow deployment• Storage• Correct deployment for maximum benefit



Managing the county's flood risk

Durham County Council is a Lead Local Flood Authority (LLFA) as defined by the Flood and Water Management Act 2010 and the Flood Risk Regulations 2009.



As a LLFA the council is required to develop a strategy to tackle local flood risks, involving flooding from surface water, 'ordinary watercourses' (for example ditches, dykes, and streams), groundwater, canals, lakes and small reservoirs.

The council will achieve this by working with other organisations, such as the Environment Agency which has a strategic role for all flood risk matters across England and Wales. The Environment Agency is also responsible for flood risk from main rivers, large reservoirs and the sea.

As an LLFA, Durham County Council is required to:

- Investigate all significant flooding incidents
- Maintain a register of flood defence assets
- Ensure use of sustainable drainage on new developments, approve, adopt and maintain existing developments; and build partnerships and ensure effective working between authorities that have control over flood risk

Managing the county's flood risk



The Environment Agency

The Flood and Water Management Act gives the Environment Agency a strategic overview role for all forms of flooding and coastal erosion. They also have permissive powers for the prevention, mitigation and remedying of flood damage for main rivers and coastal areas.

www.gov.uk/environmental-management/flooding-coastal-change

Riparian owners

Under common law, a riparian owner is someone who has a watercourse within or adjacent to any boundary of their property. Where a watercourse is sited between two or more property boundaries each owner may be equally responsible. Under the Flood and water Management Act 2010, riparian owners retain all the duties and responsibilities for watercourses in their land set out in the Land Drainage Act.

Water companies

Water companies are responsible for public sewers, and have a role in the management of surface water.

www.nwl.co.uk/



How would your community survive in an emergency?

Get support to make a plan for your community:

Telephone: 03000 264 654

Email: ccuenquiries@durhamdarlingtonccu.gov.uk



For the latest community resilience updates, 'like' us on Facebook:

www.facebook.com/ResilientDurham



RESILIENTDURHAM

communities

Please ask us if you would like this document summarised in another language or format.

ccuenquiries@durhamdarlingtonccu.gov.uk

03000 264 654