

Working with the
Calderdale Flood Partnership



how we're reducing the risk of flooding for Calderdale



Calderdale flood action plan

Full action plan
October 2016

The Boxing Day floods had a devastating impact on the communities in Calderdale with over 3,500 homes and businesses affected. This plan contains the actions that communities and partners feel are essential to help Calderdale recover from the floods and to improve resilience and reduce the risk of flooding.

The actions have been gathered through workshops, drop-in sessions and meetings. Many of the actions are ongoing and form part of other plans and programmes, including the Calderdale Local Flood Risk Management Strategy, the 6-year investment programme and recommendations from the Calderdale Flood Commission Report.

This action plan is a 'living document' that will be discussed, monitored and updated by the Calderdale Flood Partnership. All members of the partnership are committed to its delivery and want an action plan that is available to everyone and which sets out a clear vision to inspire and encourage communities and organisations to work together to reduce the impact of future flooding.

Calderdale is a special place and will always need to prepare, respond and adapt to floods. This action plan outlines how this will be achieved and we will continue to identify and deliver actions to reduce flood risk and protect and improve the environment.¹

A summary document of this action plan has also been produced and can be found on www.gov.uk if you search for 'Calderdale flood action plan'.

For further information and if you have any comments on the Calderdale flood action plan please email calderdalefloodplan@environment-agency.gov.uk

Please note: Where you see this icon  it means that the action will deliver wider benefits for people and wildlife in addition to reducing the risk of flooding.

¹ The Environmental Assessment of Plans and Programmes Regulations 2004 (SEA) regulations do not apply to this plan, as it does not fall under the definition of 'plans and programmes'. However, we will ensure an appropriate level of environmental assessment will be undertaken for any actions where there is potential to damage the environment. Some actions will require further investigation and assessment under specific legislation, for example Habitats Regulations Assessment (HRA). The need for HRAs will be determined on a project by project basis.



Strengthening defences

Actions in this theme are about constructing and strengthening infrastructure such as flood defences, sewer systems, electricity substations and sustainable drainage systems to reduce the impact as flood water travels through towns and villages.

Following the Boxing Day 2015 floods, action was taken to repair and strengthen infrastructure to ensure it is operational for winter.

Over the next few years, flood defence and alleviation schemes will be planned and constructed in Mytholmroyd and Hebden Bridge. Yorkshire Water is reviewing and improving its sewer network where flooding has occurred in the past. Calderdale Metropolitan Borough Council is investigating and reducing the risk of flooding from smaller watercourses, encouraging the implementation of more sustainable drainage and producing surface water management plans. Northern Power Grid has identified substations that are at risk of flooding and plan to move or improve its resilience.

We will continue to review the flood risk of roads, railways, water and power supplies that are locally critical, and we will take action, where appropriate, to protect them.

	What we're going to do	When we will do it by	Who's leading	Who's supporting
1 	Develop and deliver a flood alleviation scheme for Mytholmroyd.	End of 2019	Environment Agency	Calderdale Metropolitan Borough Council
2 	Develop and deliver a flood alleviation scheme for Hebden Bridge.	End of 2020	Environment Agency	Calderdale Metropolitan Borough Council
3 	Develop and deliver, where feasible, flood risk management work as part of the first phase of the flood risk reduction schemes at: • Pin Hill Lane, Midgley • Burnt Acres Wood, Callis Bridge • Erringden Hillside, Hebden Bridge • Park Road, Elland • Woodland View, Eastwood.	Ongoing	Environment Agency	Calderdale Metropolitan Borough Council

	What we're going to do	When we will do it by	Who's leading	Who's supporting
4 	Undertake initial assessments, develop and deliver (if applicable) flood risk management works at the following (but not limited to) locations, as part of the second phase of the flood risk reduction schemes: • Oak Hill Clough, Ashenhurst Road and Cross Lee Road; Shaw Wood Road; Cross Stone Road in Todmorden • Machpelah Screen, Hebden Bridge • River Calder/Ryburn Confluence, Sowerby Bridge • Railes Close, Midgley • Hebble Brook, Dean Clough, Halifax • A646, The Square, Mytholmroyd • Copley Village • Luddenden Foot • Walsden • Jumble Dike, Brighouse.	Ongoing to end of 2021	Environment Agency	Calderdale Metropolitan Borough Council Yorkshire Water Network Rail Canal & River Trust
5	Carry out an initial assessment for Brighouse and if justifiable develop and deliver a flood alleviation scheme.	End of 2020	Environment Agency	Calderdale Metropolitan Borough Council Yorkshire Water
6	Carry out improvements to access and telemetry at Hebble Brook Screen.	End of 2017	Calderdale Metropolitan Borough Council	Environment Agency
7	Implement the Calderdale flood investment plan to secure match funding.	End of 2018	Calderdale Metropolitan Borough Council	Environment Agency
8	The Calderdale Flood Partnership will submit a flood management programme to the Regional Flood and Coastal Committee. The programme, which will be based on evidence and regularly updated, will identify and prioritise schemes based on risk and vulnerability, smaller flood risk reduction schemes and capital maintenance.	Ongoing	Environment Agency	Calderdale Metropolitan Borough Council Yorkshire Water

	What we're going to do	When we will do it by	Who's leading	Who's supporting
9	Compile a detailed register of all flood risk assets, including all potential flood defences, high risk culverts, watercourses, highway drains and other drainage assets, structures and locations.	End of 2018	Calderdale Metropolitan Borough Council	Yorkshire Water Environment Agency
10	Investigate further the flooding across Calderdale from groundwater, ordinary watercourse and surface water.	End of 2021	Calderdale Metropolitan Borough Council	Environment Agency
11	Work with partners to inspect and carry out work to address any structural defects in the Hebble Brook culvert.	End of 2021	Environment Agency	
12	Assess, design and carry out improvements to Cragg Road culvert.	2021 - onwards	Calderdale Metropolitan Borough Council	Environment Agency
13	Repair the Harley Wood bypass channel that is currently in a poor condition.	2022 - onwards	Calderdale Metropolitan Borough Council	Environment Agency
14	Identify sections of the towpath that can be hardened to improve resilience. Put in place a programme for improvements subject to funding.	End of 2017	Canal & River Trust	
15	Carry out a feasibility study to remove or raise the Kingfisher Chase, Sowerby footbridge that prevents water flowing in times of high floods.	2022 - onwards	Calderdale Metropolitan Borough Council	Environment Agency
16 	Remove the weir at Lobb Mill to reduce flood levels to reduce the risk of flooding in Todmorden.	2024 - onwards	Calderdale Metropolitan Borough Council	Environment Agency
17	Carry out a study of and improvements to the Shoebread Clough reservoir to reduce the risk of flooding from the nearby watercourse.	2021 - onwards	Calderdale Metropolitan Borough Council	Environment Agency

	What we're going to do	When we will do it by	Who's leading	Who's supporting
18	Improve the culvert to reduce the risk of flooding at Smithy Lane, Colden.	2021 - onwards	Calderdale Metropolitan Borough Council	Environment Agency
19	Carry out a study to upgrade the existing culvert and reduce the risk of flooding to downstream properties at Stoodley Grange/Lee Bottom Road.	2021 - onwards	Calderdale Metropolitan Borough Council	Environment Agency
20	Carry out a study of, and improvements to the Swineshead Clough reservoir to reduce the risk of flooding from the nearby watercourse.	End of 2023	Calderdale Metropolitan Borough Council	Environment Agency
21	Investigate the condition, location and capacity of the culverted watercourse on the steep hillside at Willowfield Estate to reduce the risk of flooding to nearby houses.	2021 - onwards	Calderdale Metropolitan Borough Council	Environment Agency
22	Complete surface water management plans using information from studies on the existing drainage system to identify where there is not enough capacity.	Ongoing	Calderdale Metropolitan Borough Council	Yorkshire Water
23	Identify joint schemes to reduce the risk of flooding by better understanding the links between surface water and sewer networks.	Ongoing	Calderdale Metropolitan Borough Council	Environment Agency Yorkshire Water Network Rail
24	Produce surface water management plans for all critical drainage areas, including Hebden Bridge, Ripponden, Halifax, Elland and Brighouse.	End of April 2018	Calderdale Metropolitan Borough Council	Yorkshire Water Environment Agency
25	Work with partners to investigate the feasibility of measures to reduce sewer flooding in Todmorden.	End of June 2017	Yorkshire Water	Environment Agency Calderdale Metropolitan Borough Council

	What we're going to do	When we will do it by	Who's leading	Who's supporting
26	Work with partners to investigate the feasibility of measures to reduce sewer flooding in Brighouse.	End of June 2017	Yorkshire Water	Environment Agency Calderdale Metropolitan Borough Council
27	Replace spring drain at Widdop to ensure stability of reservoir embankment.	End of 2018	Yorkshire Water	
28	Replace storm pumps and control panel at Elland Lowfield sewage pumping station.	End of 2019	Yorkshire Water	
29	Investigate feasibility of measures to solve flooding in properties on Rochdale Road, Walsden.	End of 2017	Yorkshire Water	
30	Investigate feasibility of measures to solve flooding in properties on Oldham Road, Ripponden.	End of 2017	Yorkshire Water	
31	Investigate feasibility of measures to replace support structures at Walker Lane, Sowerby Bridge, and Huddersfield that were washed away during the December 2015 floods. Measures are currently in place here to prevent loss of service and flooding.	End of 2017	Yorkshire Water	
32	Investigate feasibility of measures to solve flooding in properties on Armytage Road, Brighouse.	End of 2017	Yorkshire Water	
33	Investigate feasibility of measures to solve flooding in properties on West Street, Brighouse. Suspected link between land drainage and combined networks.	End of 2019	Yorkshire Water	

	What we're going to do	When we will do it by	Who's leading	Who's supporting
34	Investigate feasibility of measures to solve flooding in properties on Prospect Place, Norwood Green, Halifax.	End of June 2017	Yorkshire Water	
35	Investigate feasibility of measures to improve free discharge from combined sewer overflow to reduce flooding at Old Bridge Inn, Ripponden.	End of 2019	Yorkshire Water	
36	Investigate the feasibility of repairing abutments of reservoir overflow crest bridge at Baitings.	Ongoing	Yorkshire Water	
37	Investigate the feasibility of automating the radial gate at Turvin Clough. This would mean the gate could be opened automatically in the event of a flood warning.	End of 2018	Yorkshire Water	
38	Strengthen the gas network by: • introducing syphon points as standard on replacement schemes; • adding new water extraction equipment; • investing more in managing pressure remotely to monitor changes in pressure and adjust them to avoid loss of supply; investing in overcrossing, aiming in the long term to put vulnerable crossings underground.	Ongoing	Northern Gas Network	Calderdale Metropolitan Borough Council
39	Repair or replace power substations at Scout Road 864, HX7 5DU; Lock Hill Mill 577, HX6 2LA; Mayroyd 641, HX7 6AT; Der Street Mills 1145, OL14 5QT; Gauxholme 383, OL14 7PD and Hebble End 2243, HX7 6AT.	End of 2020	Northern Power Grid	
40	Relocate current power substations at Calder Mill 196, HX7 5NA; Cheetham St 1827, HX7 8EJ; Market Street 633, HX7 6AT and Victoria Road 1017, HX7 8JR.	End of 2021	Northern Power Grid	

	What we're going to do	When we will do it by	Who's leading	Who's supporting
41	Improve resilience of power substations at Calder House Mill 1225, HX7 5QF and Walton St 775, HX6 1AN.	End of 2022	Northern Power Grid	
42 	Find information on landslips that have occurred in the past and investigate the possibility of them happening again. After any flooding we will look at the chance of landslides taking place.	End of 2017	Calderdale Metropolitan Borough Council	
43 	Investigate and improve surface water flow routes and ponding, in particular by using sustainable drainage systems more widely across the catchment.	End of 2018	Calderdale Metropolitan Borough Council	
44	Investigate the feasibility of using low risk areas to manage highway flooding from overland flows in a sustainable manner.	End of 2018	Calderdale Metropolitan Borough Council	Calder Catchment Flood Studies Network Environment Agency
45 	Develop further planning guidance that encourages sustainable drainage systems in areas with critical drainage problems, and reduces run-off in line with greenfield sites.	End of 2017	Calderdale Metropolitan Borough Council	Yorkshire Water
46 	Continue to support community led projects that raise awareness of the benefits of sustainable drainage systems as well as further promoting the Construction Industry Research and Information Association sustainable drainage systems manual.	Ongoing	Calderdale Metropolitan Borough Council	Yorkshire Water
47 	Create an online information resource - ' <i>Save some space for a rainy day</i> ' designed to encourage and enable smaller landowners throughout the Calder catchment to implement sustainable drainage systems on their land.	End of 2017	Calder Catchment Flood Studies Network	Environment Agency



Natural flood management

Actions in this theme are about working with farmers, landowners and organisations, such as Moors for the Future, White Rose Forest and Treesponsibility, to manage the landscape to slow the flow of water. Actions include temporarily storing water, planting trees or changing the way farmland is managed so that it absorbs more water.

Work will be carried out this winter to plant trees and build leaky dams in the Upper Calder Valley. Sites will be selected for sphagnum bog restoration projects as part of MoorLIFE 2020 to improve the ability of the moors to absorb and hold water. A guide will be created for landowners to help them design and implement natural flood management measures such as leaky dams, tree planting or alternative stock management.

Agri-environment schemes will help support flood management, and we are exploring the opportunities for the Countryside Stewardship facilitation fund to help more farmers and land managers undertake natural flood management projects.

	What we're going to do	When we will do it by	Who's leading	Who's supporting
Policy				
48 	Produce a woodland management strategy to support the maintenance of woodlands created for natural flood management.	End of 2017	Calderdale Metropolitan Borough Council	Forestry Commission Pennine Prospects Calder Catchment Flood Studies Network

	What we're going to do	When we will do it by	Who's leading	Who's supporting
49 	Revise the Clough Woodland Guiding Principles for use in the South Pennines. This is currently underway and will include design considerations for upland birds found in the South Pennines such as twite.	End of 2016	Moors for the Future	White Rose Forest Environment Agency Source Partnership South Pennines Local Nature Partnership
50 	Investigate new and existing funding sources and develop a funding strategy to support a natural flood management programme. Make sure this feeds into the Leeds City Region Green Infrastructure Investment Plan for Water and Flood Resilience.	End of 2017	Natural Flood Management Operational Group	
51 	Consider using funding from the Community Infrastructure Levy for natural flood management.	End of 2017	Calderdale Metropolitan Borough Council	
52 	Investigate how an increase in heather cutting as a preferred management technique could be introduced into future land management agreements.	Ongoing	Natural England	
53 	Share good practice in drawing up maintenance agreements for natural flood management with landowners.	Ongoing	Natural Flood Management Operational Group	Calderdale Metropolitan Borough Council Pennine Prospects Calder Catchment Flood Studies Network
54 	Learn lessons from the Defra 25 year environment plan pioneer areas, share the findings and provide a range of benefits for the local community and economy.	Ongoing	Natural Flood Management Operational Group	Environment Agency

	What we're going to do	When we will do it by	Who's leading	Who's supporting
55 	Contribute to government policy on land management to reduce the risk of flooding.	Ongoing	Natural Flood Management Operational Group	
56 	Implement consistently local planning policies and European regulations for protecting the habitat condition and status of Special Areas of Conservation and Special Protection Areas.	Ongoing	Calderdale Metropolitan Borough Council	Natural England Environment Agency
Engagement				
57 	Coordinate the engagement of landowners to support them in identifying and implementing a range of natural flood management measures.	Ongoing	Natural Flood Management Operational Group	
58 	Create natural flood management guidance for farmers, landowners and other practitioners similar to that being produced in the Dales National Park.	End of 2017	Natural Flood Management Operational Group	Environment Agency Yorkshire Dales National Park White Rose Forest Aire & Calder Catchment Partnership National Farmers' Union Natural England Leeds City Region Natural Flood Management Task Group
59 	Through the Countryside Stewardship Scheme and the facilitation fund, encourage more farmers in specific areas to carry out and maintain natural flood management.	Ongoing	Natural England	Yorkshire landowners Environment Agency Calderdale Metropolitan Borough Council

	What we're going to do	When we will do it by	Who's leading	Who's supporting
60 	Encourage landowners of pasture land to prevent soil becoming compacted by aerating it to allow water to soak in (infiltration) and reduce run-off.	Ongoing	National Farmers' Union	
61 	Use permissive powers under the Land Drainage Act to encourage or enforce landowners to manage upland drainage infrastructure where it will have flood risk benefits.	Ongoing	Calderdale Metropolitan Borough Council	National Farmers' Union
62 	Work with landowners/occupiers to progressively review existing burning consents and agreements as part of the consideration for the long-term management requirements for the restoration of blanket bog.	Ongoing	Natural England	Yorkshire Water Private landowners
Data				
63 	Coordinate the production of natural flood management opportunity maps to show places where the risk of flooding could be reduced and water quality improved.	End of 2017	Natural Flood Management Operational Group	Calderdale Metropolitan Borough Council
64 	List natural flood management structures on an asset register and produce a natural flood management asset map of the catchment.	End of 2017	Natural Flood Management Operational Group	Calderdale Metropolitan Borough Council Environment Agency Calder Catchment Flood Studies Network
65 	Use geographical information systems and partnership analysis of Yorkshire Water owned-land across the region to find the best areas to create woodland and carry out natural flood management.	End of 2016	Yorkshire Water	White Rose Forest Environment Agency Calderdale Metropolitan Borough Council Woodland Trust Forestry Commission

	What we're going to do	When we will do it by	Who's leading	Who's supporting
66 	Produce a map of land use to inform potential locations for natural flood management.	End of 2016	Environment Agency	
67 	Identify places where creating woodland and changing the way woodland is managed will reduce the risk of flooding.	Ongoing	Forestry Services (Forestry Commission)	Yorkshire Water National Trust Other owners of woodland holdings Environment Agency
68 	Carry out modelling to identify communities and properties where natural flood management measures could potentially reduce the risk of flooding.	Ongoing	Environment Agency	
69 	Use hydrological and land cover information to identify priority areas for grip blocking (blocking drainage ditches to hold water) within the Special Area of Conservation (SAC). This is as well as continuing to block a further 110 kilometres of blanket bog grips across the Upper Calder Valley, including Walshaw Moor.	Ongoing	Natural England	Environment Agency Moors for the Future University of Leeds
70	Identify and review historical water infrastructure such as old mill ponds, water tanks and dams, to understand whether they can be reused to reduce flood risk.	Ongoing	Environment Agency	Calderdale Metropolitan Borough Council
71	Model the risk of rural highway flooding and identify ways of reducing the risk such as moving farm gates.	End of 2017	Calderdale Metropolitan Borough Council	
72	Coordinate the mapping of rural land drainage and identifying ways to reduce flood risk. Include understanding the role of dry stone walls, hedges and gates in retaining water.	Ongoing	Natural Flood Management Operational Group	
73	Review the feasibility of undertaking a project to monitor the hydrology and saturation levels on upland areas of the Upper Calder Valley.	End of 2017	Natural Flood Management Operational Group	

	What we're going to do	When we will do it by	Who's leading	Who's supporting
Implementation				
74 	Increase the amount of woodland from 6% to 13% of the catchment as part of the '<i>Trees for Yorkshire</i>' programme to reduce erosion and the risk of landslides. These target figures will be included in the revision of the Leeds City Region Green Infrastructure Strategy in December 2016. The strategy's natural flood management actions will be an important part of the Leeds City Region Green Infrastructure Investment Plan for Water and Flood Resilience that the West Yorkshire Combined Authority will publish in May 2017.	Ongoing	White Rose Forest Calderdale Metropolitan Borough Council Environment Agency Treesponsibility Woodland Trust Forestry Commission Natural England RSPB Yorkshire Wildlife Trust National Trust	Yorkshire Water Landowners
75 	Tree planting as part of Trees for Yorkshire at Hardcastle Craggs, Wilcroft House, Stonebooth Cottage, Upper Crimsworth, Pinnacle Farm, Lodge Farm, Trial Holes (Upper Calder Catchment), and Pickwood House, Lower Springs Farm, Upper Longbottom and Calf Hey (Middle Calder Catchment).	End of 2017	Treesponsibility	Woodland Trust White Rose Forest Moors for the Future
76 	Deliver a programme to manage woodland that will reduce the amount of bare ground and erosion by removing beech trees and dealing with invasive plants. 2016 and 2017 sites include Dillscouts Wood, Knott Wood, Brown Bottom Farm, and Hebden Hey.	End of 2017	Blackbark	
77 	Build leaky dams and carry out other natural flood management measures at sites including Hebden Hey, Upper Strines, Inchfield Pasture, Stonebooth Cottage, Longfield, North Midgelden Farm, Dillscouts wood. (All in the upper Calder catchment).	End of 2017	Treesponsibility	Environment Agency Calderdale Metropolitan Borough Council Calder Catchment Flood Studies Network Blackbark EGG Consultants

	What we're going to do	When we will do it by	Who's leading	Who's supporting
78 	Carry out a project to create plate weirs, woody debris and leaky dams on sites within and adjacent to Crimsworth Dean Beck, Hardcastle Craggs and Hebden Water to reduce flood water and flood peak.	End of 2018	Calder Catchment Flood Studies Network	Natural England National Trust Environment Agency Calderdale Metropolitan Borough Council Yorkshire Water Various private landowners
79 	Through the support of MoorLIFE 2020, identify priority blanket bog restoration areas and appropriate techniques within the South Pennine Moors Special Area of Conservation located in the Upper Calder Valley.	End of 2016	Moors For The Future	Pennine Prospects Yorkshire Wildlife Trust Natural England Environment Agency Yorkshire Water Moorland Association National Trust
80 	Restoring rivers and creating wet woodland, which is linked to outdoor education work at Brierley Fields, Mytholmroyd.	Long term	Calder & Colne Rivers Trust	
81 	Carry out, where appropriate, parts of the South Pennine Moors Special Areas of Conservation/Special Protected Areas site improvement plan to restore and stabilise peat, which could reduce run-off.	Ongoing	Natural England	Yorkshire Water Environment Agency Moors for the Future Landowners
82 	Build on past work to restore moorland on Yorkshire Water land by improving the habitat, for example by trialling the introduction of <i>sphagnum moss</i> .	Ongoing	Yorkshire Water	Natural England Moors for the Future Tenants and Commoners

	What we're going to do	When we will do it by	Who's leading	Who's supporting
83 	Improve Clifton Beck as part of the Clifton Beck Diffuse Pollution Project to also reduce the risk of flooding through: creating buffer zone strips, planting trees and plants on river banks, restricting livestock access to the beck and removing invasive non-native plants. The project will deliver Water Framework Directive objectives and involve the local community.	End of 2021	Yorkshire Wildlife Trust	Environment Agency Calder & Colne Rivers Trust Riverfly Landowners



Maintenance

Actions in this theme are about repairing and maintaining flood defences, rivers, bridges, roads and other infrastructure so they remain in good working order and can hold as much flood water as possible. This includes maintaining river channels, removing debris, cleaning gullies and keeping sewers and reservoirs in good condition.

The Environment Agency is updating its routine maintenance activities in light of the Boxing Day floods and Calderdale Metropolitan Borough Council has reviewed their gulley cleaning. We are spending over £9 million repairing flood defences in Calderdale. The Canal & River Trust has repaired towpaths and reopened the Rochdale Canal.

Yorkshire Water has ensured that reservoirs and water treatment works are back to full operation. All partners have committed to holding an annual meeting where the Environment Agency, Calderdale Metropolitan Borough Council, Yorkshire Water and Canal & River Trust will set out their maintenance plans and support local communities to carry out their own maintenance work.

	What we're going to do	When we will do it by	Who's leading	Who's supporting
84 	Develop a long-term, evidence based costed strategy for managing invasive plant species. The strategy will identify the damage caused, ways of managing both invasive species and the soil, and how we will fund and carry out this work.	End of 2017	Environment Agency	Calderdale Metropolitan Borough Council Riparian owners Calder Futures Treesponsibility River Stewardship Company Yorkshire Water Yorkshire Wildlife Trust Yorkshire Invasive Species Forum Canal & River Trust

	What we're going to do	When we will do it by	Who's leading	Who's supporting
85 	Review and update existing studies that have informed the way we maintain channels. Publish a channel maintenance programme (to include vegetation, gravel, silt and debris) that is based on this evidence and that has been developed with the community. Publish the evidence we used and explain how we arrived at our conclusions. Support community-led channel maintenance and stewardship.	End of 2017	Environment Agency	Riparian owners Community organisations Calder Futures Treesponsibility
86	Host an annual maintenance meeting to discuss and review the planned maintenance work of Calderdale Metropolitan Borough Council, Environment Agency and Canal & River Trust. Involve local community representatives to promote a joined up approach and increase community involvement.	End of 2017	Calderdale Metropolitan Borough Council	Local community representatives
87 	Share best practice advice with landowners and communities to help them best understand the roles and responsibilities of managing and maintaining watercourses and adjacent land.	End of 2017	Calderdale Metropolitan Borough Council	Landowners Agents Brokers Yorkshire Water National Trust Environment Agency
88	Support communities to share knowledge of how to report maintenance issues and requirements, who to report to and the roles, remits and responsibilities of organisations.	End of 2017	Calderdale Metropolitan Borough Council	Canal & River Trust Environment Agency
89 	Work with local groups to identify where access to river channels needs to be improved to enable community led maintenance.	Ongoing	Calderdale Metropolitan Borough Council	Environment Agency Canal & River Trust Landowner

	What we're going to do	When we will do it by	Who's leading	Who's supporting
90	Work with partners, charities and local groups to continue to produce a regular newsletter and media updates that show the local community which partner organisations are responsible for specific maintenance activities and who is doing what.	Ongoing	Calderdale Metropolitan Borough Council	Environment Agency Canal & River Trust Yorkshire Water
91	Carry out structural lining of a sewer in Savile Park Mills and Moorfield Street in Halifax.	End of 2017	Yorkshire Water	
92	Carry out Widdop flood study and refurbishment of the spillway to make sure it operates safely during flooding.	End of 2018	Yorkshire Water	
93	Carry out work to protect the embankment on the upstream face of the dam at Gorpley from further erosion.	End of 2018	Yorkshire Water	
94	Carry out work to protect the embankment on the upstream face of the dam at Dean Head Lower from further erosion.	End of 2019	Yorkshire Water	
95	Identify and model the impact of flooding and damage to critical assets such as silt traps, gullies and screens to inform inspections and maintenance.	End of 2017	Calderdale Metropolitan Borough Council	Public to report blockages
96 	Repair and maintain rights of way to prevent them from flooding and becoming eroded.	Ongoing	Calderdale Metropolitan Borough Council	Local Access Forum Pennine Prospects Canal & River Trust
97 	Cut grass once a year at Environment Agency owned flood embankments and washlands in the Upper Calder Valley.	Ongoing	Environment Agency	

	What we're going to do	When we will do it by	Who's leading	Who's supporting
98	Inspect and maintain assets and structures in the Upper Calder Valley that the Environment Agency owns 3 times a year.	Ongoing	Environment Agency	
99	Carry out a programme of inspecting culverts to check that they are structurally sound and that water can flow freely through them.	Ongoing	Environment Agency	
100	Clear out trash screens each week on assets in the Upper Calder Valley owned by the Environment Agency.	Ongoing	Environment Agency	
101	In addition to our annual maintenance programme, inspect rivers and channels and, where necessary, remove any debris and vegetation that is causing a blockage that could increase the risk of flooding.	Ongoing	Environment Agency	
102	Develop a de-silting programme for plate weirs.	End of 2019	Natural Flood Management Operational Group	Calderdale Metropolitan Borough Council Pennine Prospects Calder Catchment Flood Studies Network



Community resilience

Actions in this theme are about ensuring people and property are as resilient as possible to flooding, and take actions ahead of time to help life get back to normal as quickly as possible after a flood. It includes people signing up to flood warnings, developing a personal or community action plan or making alterations to their home or business so flood water causes less damage.

Warning is essential, and since December more people have signed up to receive flood warnings and an annual emergency planning exercise has taken place. We will investigate using new methods to warn communities in areas where river levels rise quickly and continue to support schools, nurseries and care homes to have emergency evacuation plans in place.

We will establish a network for community flood action groups to share learning and ideas and set up a database of volunteers who can help out during and after a flood. To help communities in the immediate aftermath of a flood, we will investigate the potential for mobile banking services and pop-up shops such as chemists, post office and groceries, and we will host a workshop for the business and insurance community to help increase access to flood insurance.

Calderdale Metropolitan Borough Council is updating local spatial plans so that new development is located and designed to keep people safe during a flood.

	What we're going to do	When we will do it by	Who's leading	Who's supporting
Infrastructure				
103	Work with utility and telecommunication companies to improve the resilience of critical infrastructure and the provision of back-up systems where needed, for example temporary mobile phone masts and internet access.	End of 2017	Calderdale Metropolitan Borough Council	West Yorkshire Local Resilience Forum Utility and telecommunication sector

	What we're going to do	When we will do it by	Who's leading	Who's supporting
104	Carry out a resilience review of the Calderdale rail lines and identify ways of reducing the probability of flooding and reducing the time taken to reopen after a flood.	Ongoing	Network Rail	Environment Agency
105	Review the resilience and business continuity of essential emergency and community services such as fire, police stations and community facilities, including schools.	Annual	West Yorkshire Local Resilience Forum	Environment Agency
106	Work with road and rail operators to improve warnings and response times, including having better signage in place to warn people about flooded roads and alternative routes.	Ongoing	Calderdale Metropolitan Borough Council	Environment Agency
107	Encourage partners to put up signage or use other methods to warn people of flooding where there is a high risk to life.	End of 2017	Calderdale Metropolitan Borough Council	Network Rail Canal & River Trust
108	Investigate if Lloyds Bank will provide emergency banking services to conduct business transactions on behalf of other banks.	Ongoing	Calderdale Metropolitan Borough Council	Lloyds Bank
109	Investigate potential and locations for mobile banking services and pop-up shops such as chemists, post office and groceries.	Ongoing	Calderdale Metropolitan Borough Council	Banks and local businesses NHS Health emergency planning Adult health and social care team

	What we're going to do	When we will do it by	Who's leading	Who's supporting
Preparedness				
110	Hold an annual flood emergency practice day in each area throughout Calderdale to practice flood plans.	Annual	Calderdale Metropolitan Borough Council	Environment Agency Flood warden groups Yorkshire Water Partnership Community Resilience Operational Group
111	Encourage schools, nurseries and care homes to have evacuation plans in place and carry out regular practices.	End of 2016	Calderdale Metropolitan Borough Council	Environment Agency
112	Set up a network for flood wardens and flood groups to work together and share knowledge and experience.	End of 2016	Partnership Community Resilience Operational Group	Environment Agency Calderdale Metropolitan Borough Council
113	Run a volunteer recruitment campaign to set up additional flood warden groups throughout the Calder Valley, including Sowerby Bridge, Elland, Luddenden Foot and Brighouse.	End of 2016	Environment Agency	Calderdale Metropolitan Borough Council Partnership Community Resilience Operational Group
114	Produce a database of volunteers, including trained first aiders, nurses, care workers and other professionals.	End of 2017	Calderdale Metropolitan Borough Council	Local Resilience Forum Partnership Community Resilience Operational Group Town Parish councils
115	Set up and advertise a flood hub to help and support each community at risk of flooding.	End of 2016	Calderdale Metropolitan Borough Council Partnership Community Resilience Operational Group	

	What we're going to do	When we will do it by	Who's leading	Who's supporting
116	Promote and support communities and individuals to create community and individual flood plans.	Ongoing	Environment Agency	Calderdale Metropolitan Borough Council Partnership Community Resilience Operational Group
117	Distribute a laminated card containing important information such as health and safety advice, important contact numbers and locations to households in areas at risk of flooding.	End of 2016	Calderdale Metropolitan Borough Council	Partnership Community Resilience Operational Group
118	Carry out a survey to find out how many people are still without insurance cover and promote Flood Re insurance scheme to those at high risk.	End of 2018	Calderdale Metropolitan Borough Council	Relevant insurance companies
119	Host a workshop with community, business and insurance industry stakeholders to review and develop insurance options for uninsurable homes and businesses, and to recognise resilience measures to reduce premiums and expand availability.	By the end of 2017	Calderdale Metropolitan Borough Council	
120	Continue to support the development and promotion of Watermark for local flood fundraising.	Ongoing	Calderdale Community Foundation	Calderdale Metropolitan Borough Council
121	Encourage businesses to have professional standard resilience measures and contingency plans in place.	Ongoing	Calderdale Metropolitan Borough Council	
122	Develop a 'responsible landlord' scheme to encourage landlords to make information on flood risk available to tenants; carry out repairs after flooding has happened; and make it easier for tenants to find alternative accommodation while repairs are being carried out.	End of 2017	Calderdale Metropolitan Borough Council	Private landlords National Landlord Association
123	Work with estate agents and landlords to develop a floodmark symbol to use in tenancy agreement for properties in areas at risk of flooding.	End of 2017	Calderdale Metropolitan Borough Council	

	What we're going to do	When we will do it by	Who's leading	Who's supporting
124	Create a communications and engagement plan to promote and encourage the floodmark symbol to be used throughout the local area.	End of 2017	Calderdale Metropolitan Borough Council	
125	Run local flood awareness campaigns to target visitors as well as residents and local businesses.	Ongoing	Calderdale Metropolitan Borough Council	Environment Agency Yorkshire Water
126	Work with local schools to raise awareness of flooding and help students develop knowledge and skills to manage flood risk and keep safe during flooding.	Ongoing	Environment Agency	Calderdale Metropolitan Borough Council Partnership Community Resilience Operational Group
127	Work with the Health and Wellbeing Board of Calderdale Metropolitan Borough Council to plan the effects of future flooding on people's health.	Ongoing	Calderdale Metropolitan Borough Council	Yorkshire Water Environment Agency Kirklees Planning Office
128	Expand on the Joseph Rowntree 'kindliness initiative' to encourage individuals and families to look out for each other and their neighbours.	End of 2016	Calderdale Metropolitan Borough Council	Partnership Community Resilience Operational Group
129	Continue to develop the community-led web portal, Eye on Calderdale, providing up to date information about flooding and resilience across Calderdale.	Ongoing	Calderdale Metropolitan Borough Council	Environment Agency Partnership Community Resilience Operational Group
130	Update strategic flood risk assessments by using knowledge and information following the December 2015 floods and use this to inform local planning policy and decisions.	End of 2016	Calderdale Metropolitan Borough Council	Environment Agency Yorkshire Water
131	Hold a workshop for planners and architects to share best practice and discuss how through locating and designing new developments, the risk of flooding can be reduced.	End of 2017	Calderdale Metropolitan Borough Council	Town and Country Planning Association Environment Agency Yorkshire Water

	What we're going to do	When we will do it by	Who's leading	Who's supporting
132	Develop a show house to showcase flood resilient design.	End of July 2017	Calderdale Metropolitan Borough Council	Environment Agency
133	Signpost homeowners who are renovating or constructing new property to advice on resilience measures, including information on access to surveyors and grants.	Ongoing	Calderdale Metropolitan Borough Council	Environment Agency
Warnings				
134	Assess and improve the performance of our warnings so that people know what to expect earlier and have more time to take effective action.	End of 2017	Environment Agency	Partnership Community Resilience Operational Group
135	Incorporate flood warning information into satellite navigation systems to warn people on the move.	End of 2018	Environment Agency	
136	Investigate flood wardens receiving river level alarms to give them a heads-up of flood forecasts and warnings.	End of April 2017	Environment Agency	Partnership Community Resilience Operational Group
137	Help communities at high risk of flash flooding to install their own methods of monitoring weather and river conditions and triggering alerting systems.	End of 2017	Calder Catchment Flood Studies Network	Partnership Community Resilience Operational Group Environment Agency
138	Install additional mass alerting system to inform more people in high-risk areas when flooding is imminent.	End of 2018	West Yorkshire Local Resilience Forum	Environment Agency
139	Encourage more people to sign up for flood warning services and to know what action to take when they receive the warnings.	Ongoing	Environment Agency	Calderdale Metropolitan Borough Council
140	Review and extend the opt-out approach to mobile phones receiving warnings.	End of 2017	Environment Agency	Partnership Community Resilience Operational Group
141	Support and, where needed, provide training to professional partners, including flood groups, on using social media to raise awareness of the risk of flooding, flood warnings and how to be better prepared for flooding.	End of 2017	Environment Agency	Calderdale Metropolitan Borough Council

	What we're going to do	When we will do it by	Who's leading	Who's supporting
142	Investigate the use and introduction of automated alerts and warnings to improve response times.	End of 2020	Environment Agency	Partnership Community Resilience Operational Group
143	Carry out a prioritised programme of hydrometry and telemetry improvements.	End of 2021	Environment Agency	
144	Provide more online forecasts, including communicating the probabilities of flooding and flash flooding.	End of June 2018	Environment Agency	Partnership Community Resilience Operational Group
145	Investigate how we can integrate risks from surface and groundwater flooding into our existing flood warning service, and help local councils reach those people at risk of flooding from local sources.	End of 2018	Environment Agency	Partnership Community Resilience Operational Group
146	Investigate improvement of existing flood warning measures by extending the network of rain gauges throughout Calderdale, using telemetry, the CCTV network and Flood Forecasting Centre.	End of 2017	Environment Agency	Calderdale Metropolitan Borough Council Partnership Community Resilience Operational Group
147	Investigate producing maps (preferably in real time) that show roads affected by and impassable due to flood water and make them available including the use of social media.	Ongoing	Calderdale Metropolitan Borough Council	
Recovery				
148	Provide an information hub where people can access help, counselling, welfare support and advice to reduce the emotional and psychological effects of flooding.	End of 2016	Calderdale Metropolitan Borough Council	
149	Review and communicate how flood recovery grants were allocated in 2015 to 2016. Consider any policy modifications to promote take up.	End of 2017	Calderdale Metropolitan Borough Council	

	What we're going to do	When we will do it by	Who's leading	Who's supporting
150	Establish a team and enterprise programme to identify empty properties which could be reused by local businesses following a flood. This will be tested in Mytholmroyd.	End of 2016	Calderdale Metropolitan Borough Council	
151	Explore the option for bridging loans to keep businesses open.	Ongoing	Calderdale Metropolitan Borough Council	Leeds City Region
152	Ensure that statutory and voluntary organisations have actions in existing plans to support vulnerable people and make sure that during flooding, they receive appropriate support and that vital services continue.	Ongoing	West Yorkshire Local Resilience Forum	Volunteers
153	Create a programme of social activities for vulnerable or older people to maintain social contacts if they have been forced out of their local area due to flooding.	Ongoing	Calderdale Metropolitan Borough Council	Older peoples committee Together Housing Group
154	Identify and provide support to help the clean-up after flooding such as providing skips and carrying out extra waste collections.	Ongoing	Calderdale Metropolitan Borough Council Flood Hubs	
155	Identify those properties that have structural damage and let the owners know that they are at risk of collapsing, and advise on emergency contractors.	Ongoing	Calderdale Metropolitan Borough Council	Building surveyors Property owners



Existing water assets

Actions in this theme are about how reservoirs and canals can be used to store and carry water to reduce the risk of flooding.

The Environment Agency and Yorkshire Water are working together to identify those reservoirs which could help reduce the risk of flooding. Yorkshire Water is also undertaking studies of its sewer network to identify where improvements are needed. The Canal & River Trust is studying how the canal can be used to store flood water, and also to identify where towpaths need to be raised to prevent flooding.

	What we're going to do	When we will do it by	Who's leading	Who's supporting
Reservoirs				
156	Carry out a screening exercise to identify those reservoirs that could store water to reduce the risk of flooding.	End of 2016	Environment Agency	Yorkshire Water
157	Complete regional study to understand the impacts of using water supply assets to reduce flooding (flood attenuation).	End of 2017	Yorkshire Water	Environment Agency
158	Review a range of operating scenarios where reservoirs could be used to store water to help reduce the risk of flooding.	End of 2017	Environment Agency	Yorkshire Water
Surface water and sewage network				
159	Build drainage area plan model for Luddenden Foot drainage area zonation. Carry out a full hydraulic and serviceability assessment of foul, combined and surface water network to understand the risk of flooding to the network under a range of conditions.	End of June 2017	Yorkshire Water	

	What we're going to do	When we will do it by	Who's leading	Who's supporting
160	Build drainage area plan model for Sowerby Bridge drainage area zonation. Carry out a full hydraulic and serviceability assessment of foul, combined and surface water network to understand the risk of flooding to the network under a range of conditions.	End of August 2017	Yorkshire Water	
161	Build drainage area plan model for Elland drainage area zonation. Carry out a full hydraulic and serviceability assessment of foul, combined and surface water network to understand the risk of flooding to the network under a range of conditions.	End of November 2017	Yorkshire Water	
162	Build drainage area plan model for Hebden Bridge drainage area zonation. Carry out a full hydraulic and serviceability assessment of foul, combined and surface water network to understand the risk of flooding to the network under a range of conditions.	End of February 2018	Yorkshire Water	
Canal				
163	Update and improve the Environment Agency and other flood models, where appropriate, to include the risk of flooding from and to canals and canal pounds, and to accurately represent the interactions between canals and rivers.	End of 2017	Environment Agency	Canal & River Trust Calderdale Metropolitan Borough Council Yorkshire Water
164	Look at possible changes to canal pounds and evaluate if they could then be used to store flood water.	End of 2017	Canal & River Trust	
165 	Study the impact using canals to protect against flooding might have on moorings and navigational safety, water losses, damage to canals, sedimentation and the wider environment.	End of September 2017	Canal & River Trust	
166	Review the main water control structures along the Rochdale Canal to identify possible ways to improve resilience.	End of 2017	Canal & River Trust	
167	Identify locations and consider making improvements to canal overflows and raised walls on towpaths, where cost beneficial.	End of 2017	Canal & River Trust	
168 	Investigate feed arrangements from the summit to the east side of the Rochdale Canal to better control water and manage resources.	End of 2017	Canal & River Trust	

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