Balfour Beatty Herefordshire Council
Working for Herefordshire

Flood Investigation Report

Ross-on-Wye

12 May 2024

As Lead Local Flood Authority, Herefordshire Council carries out investigations into flooding incidents.

During such investigations, the LLFA will:

- **Identify and explain the likely cause(s) of flooding;**
- **Identify which authorities, communities and individuals have relevant flood risk management powers and responsibilities;**
- **Provide recommendations for each of those authorities, communities and individuals; and**
- **Outline whether those authorities, communities or individuals have or will exercise their powers or responsibilities in response to the flooding incident.**

The LLFA cannot:

- **Resolve the flooding issues or provide designed solutions; or**
- **Force Authorities to undertake any of the recommended actions.**

Introduction

Section 19 of the Flood and Water Management Act 2010 states:

1) On becoming aware of a flood in its area, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate—
    a. Which risk management authorities have relevant flood risk management functions, and
    b. Whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.
2) Where an authority carries out an investigation under subsection (1) it must—
    a. Publish the results of its investigation, and
    b. Notify any relevant risk management authorities.

The thresholds for the requirement of a Section 19 Flood Investigation Report are locally identified. Herefordshire's Local Flood Risk Management Strategy (LFRMS) states: "Only events that have 'significant harmful consequences' require a Section 19 investigation to be completed by HC. There is no national definition of 'significant harmful consequences' as local receptors respond in different ways." (LFRMS, Section 6.3 Investigating Flood Events).

The approach by Herefordshire Council (HC) takes into account consideration of the impacts of flooding to human health, residential properties, critical infrastructure and services, non-residential properties and economy, the road and rail network, environmental receptors and cultural heritage. HC considers 'significant harmful consequences' to be three or more properties flooded internally at ground floor level within the same locality.

Following the localised heavy rainfall event on 12 May 2024, 28 properties experienced internal flooding in three separate areas across Ross-on-Wye, in addition to highway flooding in the town centre. As a result of the event of 12 May 2024, HC has produced a Section 19 Flood Investigation Report; the study areas are shown in Figure 1.

The objective of this report is to investigate which risk management authorities (RMAs) had relevant flood risk management functions during the flooding in May 2024 and whether the relevant RMAs have exercised, or propose to exercise, their risk management functions. RMAs with Flood Risk Management duties or functions relating to the event are HC and Balfour Beatty Living Places (BBLP), Dŵr Cymru Welsh Water (DCWW) and the Environment Agency.

It should be noted that this duty to investigate does not guarantee that flooding problems will be resolved and cannot force others into action.

Location of Investigation

Figure 1 shows the general areas affected during the 12 May 2024 event.

Figures 2-6 show the existing sources of flood risk for the area, as provided through the Environment Agency's mapping systems.

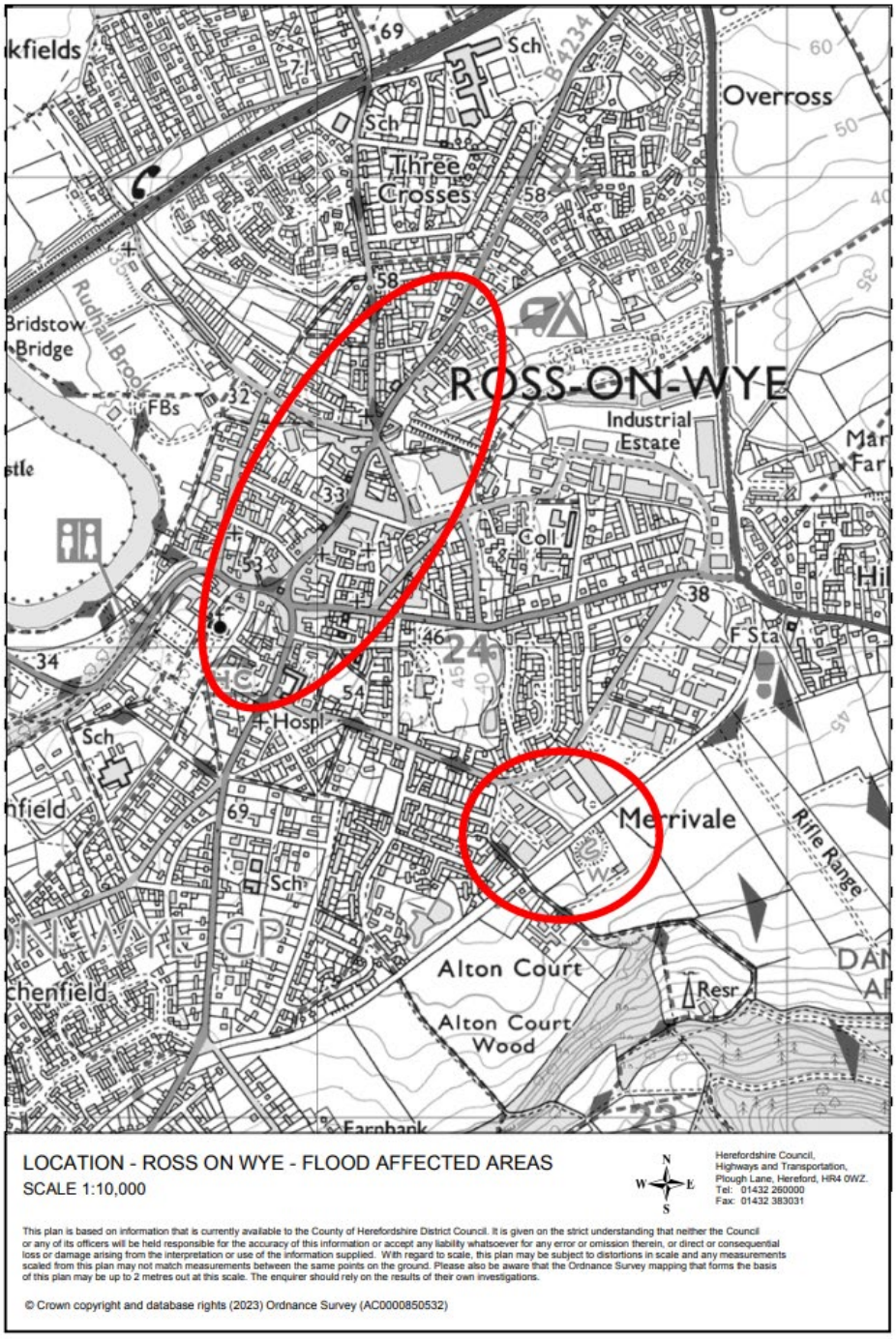

Figure 1: Large Scale Map showing the location of Ross-on-Wye and the areas affected during the 12 May 2024 event

Figure 2: Environment Agency's Flood Map for Planning (Rivers and Sea).

***Figure 3:** EA Surface Water Flood Risk Mapping for Ross-on-Wye (including Broad Street, Brookend Street and Gloucester Road).*

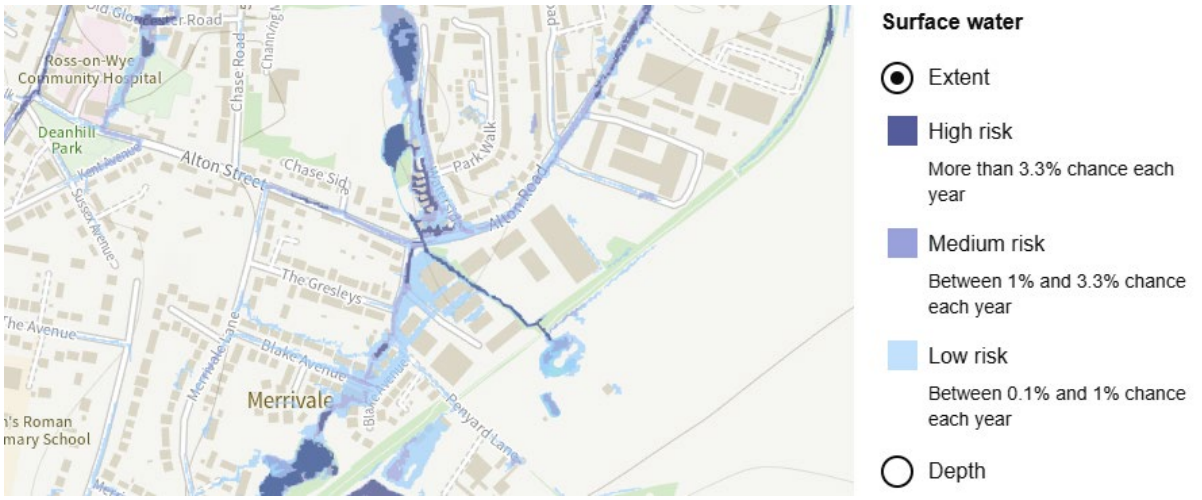

Figure 4: *EA Surface Water Flood Risk Mapping for the southeast of Ross-on-Wye (Alton Road).*

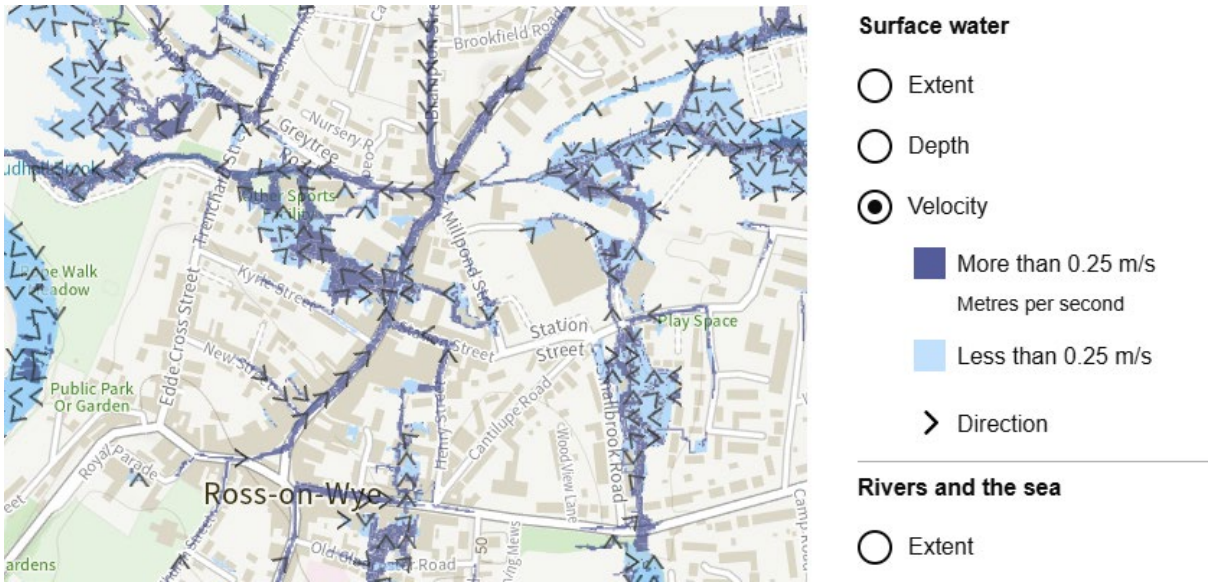

Figure 5: *EA Surface Water Flood Risk Mapping showing velocity and direction of surface water flows in Ross-on-Wye (Broad Street and Brookend Street).*

Figure 6: *EA Surface Water Flood Risk Mapping showing velocity and direction of surface water flows in Ross-on-Wye (Alton Road).*

What happened on 12 May 2024?

It is reported that on Sunday 12 May, approximately 25-30mm of rain fell on Ross-on-Wye in 30 minutes in an extreme rainfall event. To provide context, the average monthly rainfall for May (1991-2020) for the area is just over 56mm.

The rainfall led to a rapid increase and volume of surface water and associated watercourse flooding. Three localised areas of flooding occurred across Ross-on-Wye on 12 May 2024 and this report will acknowledge each area individually due to the differing flooding mechanisms.

Based on the information obtained by DCWW and the Environment Agency, it is reported that 28 properties experienced internal flooding on 12 May 2024. For the three affected areas, this equates to 22 properties in the vicinity of Broad Street and Brookend Street, 1 property on Gloucester Road and 5 properties on Alton Road.

Broad Street and Brookend Street, Ross-on-Wye

Flood Type: Pluvial (Surface Water) flooding due to sewer collapse.

22 properties located in the town centre of Ross-on-Wye experienced internal flooding primarily due to the collapse of a combined sewer, exacerbated by localised heavy rainfall on 12 May 2024. The reduced combined sewer capacity resulted in the highway not effectively draining the significant volume of runoff from the storm event, causing flooding in the highway and subsequent property flooding.

Four of the properties are located in the vicinity of Broad Street and the remaining 18 are located in the vicinity of Brookend Street. The extent of flooding varied amongst the affected properties; in some cases, this data was not recorded. Reported depths of internal flooding ranged between 1-10cm.

Gloucester Road

Flood Type: Pluvial (Surface Water)

One property on Gloucester Road reported internal flooding to the rear (south) due to the localised heavy rainfall event on 12 May 2024 and the associated surface water runoff/overland flows. The topography of the land to the rear (south) of Gloucester Road is steeply sloping from south to north. As such, the excess surface water was directed by the impermeable highway/access driveways to flow towards the rear of the affected property on Gloucester Road. The internal flood depth has not been confirmed.

Alton Road

Flood Type: Fluvial and Pluvial (Surface Water)

An additional 5 properties located to the southeast of the town centre on Alton Road also reported internal flooding at the time of this heavy rainfall event due to a combination of pluvial flooding, associated with surface water runoff/flooding on the highway, arising from fluvial flooding of the small local watercourse. Depths of internal flooding ranged between 1-5cm; one of the property owners was not in at the time of the event so the wrack marks have been recorded. We understand this to have no connection to the flooding within the town centre.

Number of Internally Flooded Properties related to key flood event	28
Number of Internally Flooded Properties during most acute flood	28
Impact on Strategic Highway Network	Broad Street experienced washout of sub-pavement materials. Brookend Street experienced highway flooding.
Impact on Critical Services	None reported.
Health Risks	No injuries or loss of life were reported.

Description of Flooding

Broad Street and Brookend Street

On Sunday 12 May 2024, Ross-on-Wye experienced localised heavy rainfall; approx. 25-30mm of rainfall fell in 30 minutes according to the information received from the duty hydrometerologist at the Met Office.

Following the storm event, on Monday 13 May 2024, subsequent site investigations identified a collapsed 300mm DCWW combined sewer located within Broad Street.

As a consequence of this failure and the associated reduced sewer capacity, the combined sewer was unable to convey the significant surface water runoff entering the highway gullies during the localised heavy rainfall event. The excess surface water runoff overwhelmed the highway gullies and, as such, began to flow down Broad Street (which steeply slopes southwest to northeast), onto Brookend Street. The topography of Brookend Street can be described as an 'urban bowl' causing the runoff to pond in the highway, overspill the kerbs and enter the adjacent properties (Figure 5). Reports were received of vehicles driving through the flood water, creating bow waves, which further affected the properties on Brookend Street.

Associated with the failure of the combined sewer, the surface water washed out the sub-base sediment from the permeable paving at the top end of Broad Street. The sediment was washed into the highway drainage and, following this, the combined sewer, causing it to block up and further reduce its capacity. The flooding subsided slowly due to the silt build up in the 450mm DCWW brick culvert sewer at Brookend Street. DCWW have subsequently undertaken remedial works to remove the silt/sediment build up from the system to increase the capacity.

Following the flooding, BBLP worked with DCWW to identify the collapsed sewer. A road closure was implemented between 12-14 May to facilitate a programme of remedial works. This work included street cleaning to remove sand from the road surface. Highway repairs were completed, and highway gully and drain cleansing followed, by BBLP and DCWW respectively. The collapsed sewer and footway were repaired by DCWW.

The Surface Water Flood Risk Mapping shows Broad Street and Brookend Street to be high-risk surface water flow routes (Figure 4). This likely demonstrates the route and ponding area of the surface water runoff which occurred due to the exceptional rainfall event and subsequent flooding due to combined sewer failure/collapse.

The Flood Map for Planning shows that Brookend Street is located within Flood Zone 3 (flooding in a 100-year flood), due to the fluvial flood risk associated with Rudhall Brook. However, this flooding episode was solely due to surface water flooding; no fluvial flooding occurred at this time. Broad Street is indicated to be mostly in Flood Zone 1 (no mapped flooding) with the lower, northern end (before joining Brookend Street) located in Flood Zone 2 (flooding in a 1000-year flood). The Ross Flood Alleviation Scheme, implemented in 2008, was found to operate effectively during this event; there were no reports of flooding in the protected area.

Gloucester Road

The Flood Map for Planning shows that Gloucester Road is solely located within Flood Zone 1 (Figure 3). However, the EA Surface Water Flood Risk Mapping shows that there is an area of high-risk surface water ponding to the rear of some properties on Gloucester Road, including the property which reported internal flooding to the rear (Figure 4). This is likely to demonstrate the route and ponding area of the surface water runoff which occurred due to the exceptional rainfall event.

The surface water runoff caused by the significant volume of rainfall within a notably short time period, in addition to the topography of the area and associated hardstanding, resulted in internal flooding to the rear of a property on Gloucester Road. A previous report of flooding is recorded on Old Gloucester Road in 2018, which was located upgradient (to the south) of the affected property on Gloucester Road. As such, it is likely that the surface water flow route continued across Old Gloucester Road before ponding at the rear of the property located on Gloucester Road (Figure 6).

Alton Road

Alton Road is located wholly within Flood Zone 1; however, the mapping does not consider flood risk from watercourses with catchments smaller than 3km2 and so the fluvial risk from the watercourse is not represented. The cause of flooding is not evident.

Alton Road is also shown to be a medium risk surface water flow route. The significant rainfall event on 12 May 2024 resulted in the highway (Alton Road) becoming a surface water flow route, as demonstrated in Figure 7. Due to the topography of the area, the surface water runoff ponded at a low point within the highway. As such, the surface water runoff reportedly spilt over the dropped kerbs and down the respective driveways towards property.

The highway drainage system was described as inadequate by respondents and the cause of this flooding episode. The purpose of highway drains is to provide drainage to the road surface for the benefit of road users. Highway drains are not designed to convey surface water runoff in all storm intensities and flows may exceed the whole network's capacity in extreme events.

We understand that Alton Road was not closed during this event likely due to the flood water subsiding relatively quickly given the nature of the event.

DCWW have acknowledged that the flooding observed on Alton Road is unlikely to be associated with the flooding experienced in the vicinity of Broad Street and Brookend Street.

Historical reports of floods [1]

Broad Street and Brookend Street

DCWW have raised a historical low-impact external flooding report on Brookend Street from 4 July 2001 relating to an exceptional weather event which affected SE Wales and the English border.

Gloucester Road

HC historic flood records show that a property located on Old Gloucester Road, to the rear of Gloucester Road, experienced pluvial flooding in 2018 whereby runoff from a lane upgradient of the property flowed over the top of an existing retaining wall to flood the rear parking space. This was due to a heavy rainfall event. It is unclear whether the any internal flooding occurred during this event.

Alton Road

There are anecdotal reports of a previous flood in 2005 as reported by residents to the EA during their site visit, however there are no associated records of this event. On 7 September 2024, further flooding occurred on Alton Street. The issue was referred to BBLP and it has been ascertained that flooding also occurred in 2023. Investigations into this flooding are currently ongoing.

Previous Flood Risk Studies

There are no flood risk studies related to these sites.

[1] On 8 September 2024, further flooding occurred on Brookend Street. The issue was referred to DCWW who established that nine properties flooded internally. Further flooding occurred on Brookend Street on 20 September 2024.

Summary and Conclusions

As the LLFA, HC has investigated the events of 12 May 2024 and has produced this report in accordance with Section 19 of the Flood and Water Management Act 2010.

This investigation has determined that on 12 May 2024 Ross-on-Wye experienced localised heavy rainfall. Approximately 25-30mm of rain fell in 30 minutes, with 28 reports of internal property flooding being received across three areas of Ross-on-Wye as a result.

Work has been undertaken to identify the causes and mechanisms of the flooding, with follow up work being arranged on the occasions where it has been found necessary. A set of recommended actions have been drawn up as set out in Table 1.

Recommended Actions

The 21 recommended actions contained in Table 1 will be used by HC to monitor progress achieved by the RMAs.

HC – Herefordshire Council BBLP – Balfour Beatty Living Places
EA – Environment Agency DCWW - Dŵr Cymru Welsh Water

Table 1: *Recommended actions*

Action	Action By	Recommended Action	How	Status
Knowing when and where it will flood				
01	HC	Work with partners to investigate the use of technology that could be used as a predictive tool and provide alerts in relation to future flood events	HC to assess as part of its Flood Response Programme, the feasibility of using such monitoring in known flooding hotspots.	Ongoing
02	HC / BBLP	To better understand if and where constraints exist on the sewer network that will cause highway flooding	HC / BBLP to assess results of CCTV surveys and other investigations to identify local constraints.	Ongoing
03	EA / HC / BBLP / DCWW	Work with partners and help the community have a better understanding of the drainage systems	HC to liaise with Risk Management Authorities (RMAs) regarding further investigations and share explanation of how the system works with the community.	Ongoing
Being rescued and cared for during an emergency				
04	EA / HC / BBLP / DCWW	All to be made aware of the need to ensure that HC are notified of such an event	HC to run an awareness campaign as part of its Flood Response Programme, to make sure that people know how to report a flood.	Ongoing
05	HC	All to be made aware of the different RMAs	HC to publish information as part of	Ongoing

			its Flood Response Programme detailing the roles and responsibilities of different organisations.	
Reducing the risk of flooding and its impact				
06	DCWW	Repair the damaged sewer	DCWW to carry out repairs to the damaged sewer.	Complete
07	DCWW	Repair pavements following sewer repairs	DCWW to reinstate the pavements on Broad Street 'like for like'.	Complete
08	HC	Resurface Broad Street and Brookend Street following sewer repairs	HC to resurface Broad Street. HC to resurface Brookend Street.	Complete Paused pending discussions with DCWW on the conclusions of its modelling investigation
09	DCWW	Ensure efficient operation of combined sewer on Broad Street and Brookend Street	DCWW to investigate performance of system. [a]DCWW have confirmed that all sewer cleaning and CCTV work is now complete (in the area of the flooding incident) and no further issues identified. Storm tank at Homs Road (large holding tank) has also been cleaned. HC / BBLP to discuss with DCWW the conclusions of DCWW's modelling investigation to confirm capacity with the combined sewer.	Ongoing[a]
10	DCWW	Ensure pumping station is working effectively	DCWW to investigate performance of system during flood events.	Complete[b]

			[b]DCWW have checked and can confirm that the telemetry and storm pumps at the station all functioned during storm events when properties flooded. Further periodic inspection of the storm overflow station during wet weather has also confirmed that the storm pumps are working as designed (photographic evidence available). All this is backed up by telemetry records to confirm operation of the pumps in wet weather conditions.	
11	BBLP	Ensure that highway drainage is maintained and cleansed at an appropriate cyclical interval	BBLP to carry out enhanced inspection and cleanse regime of gulleys – cleansing was undertaken overnight on 1 May and 8 May 2025.	Ongoing
12	BBLP / Town Council	Ensure ongoing efficient operation of highway drainage	BBLP to cleanse highway gulleys and drains following flood events. Town Council to supplement through its Lengthsman.	Complete
13	BBLP	Ensure efficient operation of Flood Alleviation Scheme (FAS)	The FAS was subjected to a detailed inspection in July 2024. No substantial defects were identified.	Ongoing
14	BBLP	Reduce the impact of flooding on the highway drainage system	HC to assess as part of its Flood Response Programme, the installation of an additional surface water system in Brookend Street.	Ongoing

Better advice and helping people to protect their families and homes				
15	EA / HC / BBLP / DCWW	Increase resilience to those impacted by flooding	HC to hold events to help homes and businesses be flood ready.[c] [c]The FloodPod offers people the chance to see, touch, and understand practical Property Flood Resilience (PFR) measures that better protect homes and businesses. It visited four locations across the county in March 2025 (including Ross-on-Wye).	Ongoing
16	Property Owners / HC / EA / DCWW	Consider flood risk to own properties	HC to assess the feasibility of securing funding for the installation of PFR measures in liaison with appropriate RMAs as part of its Flood Response Programme.	Ongoing
17	HC	Communicate the effect of bow waves on properties from passing vehicles	HC to run awareness campaign as part of its Flood Response Programme.	Ongoing
18	HC / BBLP / Town Council	Allow appropriately trained communities to close roads when properties are at risk of flooding	Establish whether the Community Flood Signage Scheme could be operated in Ross-on-Wye.[d] [d]Information provided by BBLP to the Town Council who have asked for local volunteers to help operate the	Ongoing

			scheme. HC held a Community Flood Signage scheme online briefing in May 2025.	
19	HC / BBLP / Town Council	Consider further flood mitigation measures that could be deployed in the short term	HC to run a pilot scheme providing community flood resilience measures as part of its Flood Response Programme.	Ongoing
Recovery				
20	DCWW	Provide funding to those businesses who were impacted	DCWW to consider a compensation scheme. [e]All affected businesses have had contact with DCWW following the flooding incident.	Complete[e]
21	HC / Town Council	Run Ross-on-Wye Recovery Strategy	HC / Town Council to carry out campaign to help revitalise the town centre.	Complete