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Wales

February 2020 Floods in Wales: Recovery report to end of June 2020

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Natural Resources Wales
Cambria House
29 Newport Road
Cardiff
CF24 0TP

0300 065 3000 (Mon-Fri, 8am - 6pm)

enquiries@naturalresourceswales.gov.uk
www.naturalresourceswales.gov.uk

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Contents

Executive Summary	4
Section 1 - Introduction	6
1. The events	6
2. Summary of Impacts on NRW – Who and what was affected?	6
3. Purpose of Recovery	7
4. Benefits.....	8
5. Recovery – Purpose of the Plan	8
6. Recovery Strategy	9
7. NRW Recovery Governance Structures	9
Section 2 – Summary and Next Steps	12
8. Summary of the extent of our Recovery	12
9. The Benefits of Recovery	13
10. Summary of key outstanding work	14
11. Next Steps	15
Section 3 – Identifying lessons	16
12. Capturing lessons during the Recovery Phase for further evaluation	16
Section 4 – Overview of recovery workstreams	22
13. Damage assessment & data gathering – Flood	22
14. Repairs – Flood.....	25
15. Damage assessment & Repairs – Land.....	28
16. NRW's Coal Tip & wider Landslip risks	32
17. Information and single point of contact	37
18. Environmental Effects	40
19. Recovery of our own staff	42
20. Tools and Equipment to do our job	43
21. External Relations and Community Reviews	46
SECTION 5 – Summary by Place	49
22. South East - FRM and WR.....	49
23. South Wales Central Flood Risk	51
24. South Central South Wales Central Land & Assets:	54
25. South West – Land Management Team South West Wales	55
26. Mid Wales	59
a. North –FR&WM Severn, Vyrnwy, Teme	59

b. FRM and WR Mid Wales (South)60

27. North West Wales62

28. North East Wales66

Section 5 - Appendices69

Appendix 1 – Recovery Action Plan Recommendations – First draft July 2020..... 69

Appendix 2 – Recovery Metrics and Progress74

About Natural Resources Wales

Natural Resources Wales' purpose is to pursue sustainable management of natural resources. This means looking after air, land, water, wildlife, plants and soil to improve Wales' well-being, and provide a better future for everyone.

Executive summary

The very wet winter period and flood events experienced in 2020, principally Storms Ciara and Dennis, had a significant impact on families and businesses across several communities in Wales. For every home or business that tragically flooded, the after effects will be felt for a long time to come. This impact is now being felt more deeply than ever due to the additional pressures being placed on communities by the coronavirus pandemic. Our thoughts and sympathies are with all those people and communities affected – these are people we have come to know and communities that NRW staff are a part of.

This report focuses on NRW's own recovery from the February 2020 storms. NRW is undertaking a thorough performance review of its systems, procedures, tools and ways of working to identify potential improvements to our services. A separate review is taking place to consider the issues and lessons that need to be learnt in relation to how NRW manages its forest estate following the February 2020 flood events.

The flooding events affected NRW in a variety of ways, and our work to respond to these incidents is not yet finished. Following the events in February, NRW has been undertaking substantial recovery works. This report reflects the position at the end of June, four months into the recovery phase, and describes our journey doing so. The key output from this recovery report is the accompanying action plan at Appendix 1, which outlines the outstanding work. We will continue to track progress on the immediate priorities through targets and measures (including the metrics at Appendix 2).

Our response and recovery work has included:

- supporting communities and partners through the challenges posed by these significant flood events;
- assessing and repairing damage to flood assets and land assets on the Welsh Government woodland estate that we manage;
- responding to large numbers of requests for information;
- understanding the immediate equipment replacement or enhancement needs, including to ICT systems and services.

The incident also took its toll, both emotionally and physically, on NRW staff involved in the event. Extreme flood events like these may cause irrevocable damage to ecosystems, pushing them beyond the point of recovery. As the body responsible for the sustainable management of our natural resources, we are committed to understanding the environmental effects and the changes that may need to be made to our management of vulnerable sites and species.

Addressing all these issues has taken a huge effort from staff across NRW. It brings financial costs, the scale of which is still being established, to cover our emergency response and recovery work as well as the additional expenditure needed to deal with

consequences such as repairs. It also comes at a cost to the current workloads and programme of the teams dealing with the response.

Recovery has relied on teams from across NRW - too many to list here. Individuals and teams have put in considerable work to date, and this work continues. Thanks to their efforts, we have inspected over 2,100 flood defences and structures, as well as more than 170 high risk assets on the NRW land estate. We have also checked over a hundred spoil tips to ensure they are safe. All this was done against the backdrop of coronavirus restrictions. To date, we have received hundreds of items of key flooding correspondence and at the peak we were receiving 38 complex correspondence requests per week.

As a result, NRW and the people of Wales are already in a better position should any future flooding incident occur. We have taken steps to ensure that we are better able to respond to incidents and immediate repairs have been made to flood defences, structures and the land that we manage. These measures will help to protect people, properties, and business, ensuring the safety of those using our estate.

Despite all of this work, our journey to recovery continues and undoubtedly, will do for some time - indeed for years to come. Key outstanding work includes repairs to over 100 flood defences and structures, set to cost in the region of £1.9m, as well as repairs to assets on the NRW land estate, costing an estimated £800,000. NRW will need continued investment in the recovery of our infrastructure and enhancements to strengthen our systems and processes. We have begun the process of analysing and modelling to understand whether anything further could be done to reduce the risk of future flooding from main rivers. Many of the areas affected already benefit from sizeable flood defences and any local decisions will need to consider the impacts they will have on upstream or downstream communities.

This report sits in the wider context of Wales' vision for the green recovery from the COVID-19 pandemic, the climate and nature emergencies, and the need for climate change adaptation, mitigation and improved community resilience. The consensus from climate change scientists is that we can expect more extreme weather events in the future. Therefore, we will all need to change and adapt to make ourselves as resilient as possible to the impact that climate change will continue to have on our communities. We will need to be well prepared to be able to recover from serious flooding events and return to 'business as usual' as quickly as possible, while also recognising that the road to full recovery will be a long one. For that reason, we have been looking for opportunities to not only recover from this event, but to ensure that we can be better placed to deal with and recover from similar events in the future. NRW's review of the flooding will also consider our work immediately after the events as we entered the recovery phase. This review work is underway, and its conclusions are expected to be reported in autumn 2020.

Section 1 - Introduction

This section puts the NRW Recovery Plan into context in terms of the scale and far reaching impact of the incident on NRW, and the extent of the recovery challenge facing us.

It also outlines the structure of the recovery process and provides a summary of the work undertaken to date, the benefits that have been realised and what more needs to be done.

The events

During February 2020, Wales experienced four noteworthy rainfall events on the back of a very wet winter period. Storms Ciara and Dennis in particular had a significant impact on families and business within several communities across Wales. Three of these storms fell under the naming convention introduced by the Met Office and its European counterparts:

- Storm Ciara 8–9 February 2020
- Storm Dennis 15–17 February 2020
- Unnamed Storm 21–24 February 2020
- Storm Jorge 28 February – 1 March 2020

Phase one of the Flood Review will produce a factual report on the extent, scale and impact of the events. It will present information on the facts, including rainfall events, river levels, return periods, impacts, warnings and response. Hence, this report does not expand further on these areas.

Summary of impacts on NRW

As stated above, we recognise that the flooding had a significant impact on people, communities and businesses across Wales. Local Authorities and other Risk Management Authorities have also been dealing with the impacts on their assets. This report focuses on the variety of impacts the flooding events had on NRW.

Damage to flood and land assets

The scale and geographical scope of the flood presented a whole Wales challenge in terms of the number of assets that needed to be inspected. This included the inspection of flood defences and structures, as well as the land we manage, to make sure people, properties and businesses were protected and to ensure the safety of those using our estate.

A number of flood risk assets have been found to be in a less than good condition following the event and they will require emergency or scheduled repairs of varying scales. However, while they sustained damage, no assets failed to perform their function.

The Land Management side has reported significant impacts from the flooding including: damage to access roads and trenches; unstable trees (with risks to open access forests); slips and tips issues; hillside movement and reservoirs requiring emergency repairs.

- **Financial costs**

We have incurred costs to resource and fund both our emergency response and recovery. Additional expenditure is also needed to deal with the consequences of flood events, including repairs, leading to short and long-term cost implications for NRW.

- **Performance targets**

There are potential implications for what the organisation can deliver this year in terms of existing business plan targets, notably, the target to 'Maintain NRW flood risk management assets in high risk locations in target operating condition'. There are also implications for other scheduled capital projects.

- **Staff involved in the event**

We know that staff were directly affected by managing the incident. The volume of work required during the event, and in the immediate aftermath, to deliver our recovery was considerable. The people we rely on to carry out activities such as post event flood investigations, dealing with communities and responding to letters of complaint, are the same people who were also working during the thick of the events, analysing information and forming part of multi-agency telecons and issuing warnings. These events provide a constant stream of asks on these staff which, if not carefully managed can have an impact on their health and wellbeing.

- **Stakeholder relationships**

In some places, our relationships with people and communities affected by the flooding have come under strain. This is because of a perception that NRW has not performed the role that they understand us to have in flooding and a belief that NRW has actually exacerbated the flooding they suffered due to the actions we have or have not taken.

- **The environment**

Disturbance of freshwater ecosystems, in the form of floods, is a natural process and plays an important role in creating and regenerating habitats. However, extreme flood events like these may cause irrevocable damage to ecosystems, pushing them beyond the point from which they can recover.

Purpose of recovery

Recovery means dealing with the immediate aftermath and putting in place a plan that brings the organisation back to 'business as usual' after the incident.

We have worked to address the immediate impact on NRW from the recent storms including: repairing damage (both emergency fixes and more permanent work being designed and programmed for a later date), restoring operations, and ensuring that staff and the organisation can return to full capability. This work ran alongside the ongoing response on the ground, as well as the review work.

Recovery support was provided to assist the affected teams towards management of its own recovery.

Benefits

The Table below sets out the benefits that the Recovery Project sought to achieve.

Staff Benefits	Staff recovery, in terms of staff wellbeing, as well as practical measures to improve their future ability to respond to incidents, and their experience when doing so.
Technical Benefits	A clear plan in place to address damage caused by the recent floods, with owners and timescales for action.
Public Benefits	Immediate repairs have been made to flood defences, structures and the land that we manage to protect people, properties and businesses as well as ensure the safety of those using our estate.

Section 2 lists examples of material benefits achieved to date.

Recovery – purpose of the plan

The purpose of this report is to provide an update on progress of NRW's journey to recovery, outlining the actions taken to date and what benefits have been seen. This includes the material changes that have been made to ensure a better future for those involved in flood incident response. It also captures what further action is required to enable the recovery process to conclude. It summarises outstanding issues and the ensuing actions which may be required at a local or Wales-wide level. These remaining actions are included in the recovery action plan in Appendix 1. Within this, the actions have timescales and have been assigned owners.

The report also describes the Governance structure to the recovery process and aims to summarise the extent to which we believe we have recovered to normality. It reflects the work undertaken by the Recovery Steering Group and each workstream.

We also aim to highlight what the recovery process aims to achieve in the long term. In Section 3, we describe what lessons we have identified from the recovery phase and what actions we will take to learn from these and improve our ability to recover from such incidents in the future. In addition, we look at what further work is planned in this regard.

We will retain a Recovery Manager, who will continue to apprise the Flood Recovery and Review Programme Board regularly, and in turn, the Flood Risk Management Committee of the NRW Board, to provide an ongoing and comprehensive summary of the recovery process. This will focus on the actions that we have retained under the banner of 'recovery', either because they have not returned to business as usual processes, or to maintain sufficient pace, scrutiny and oversight of these issues. The NRW Board will seek and receive assurance from the Flood Risk Management Committee (FRMC) on progress, risks and issues.

Finally, we hope that the report serves as a useful source of reference for any future post incident recovery that NRW must undertake, informing the type of arrangements that need to be put in place and the actions required. Section 4 and Section 5 illustrate the actions taken by each workstream and within each place, respectively.

Recovery strategy

Following the onset of the flooding, we sought to begin our recovery effort at the earliest opportunity running in tandem with the response to the emergency.

With an understanding of the potential impact on NRW (as outlined in section 2), we scoped the recovery effort. While many of the workstreams ran in parallel, we prioritised staff recovery as well as work to assess the damage and make urgent repairs to NRW's assets; these were the most urgent needs.

We also prioritised work to understand, through debriefs, the issues of which were of greatest importance to staff. We are grateful for the candid feedback we received and those who undertook a thorough exercise to compile this information. From this evidence, we identified the things which could, and should, be resolved before any future flood event, while the broader root and branch review of the incident continues, helping us to learn from what has happened and where we want to improve.

As well as looking at ways to recover from the event, we have looked for opportunities to enable us to be in a better place if and when we need to recover from similar events in the future. Examples include having clear processes and guidance in place, implementing additional training and improving the resilience of our rotas.

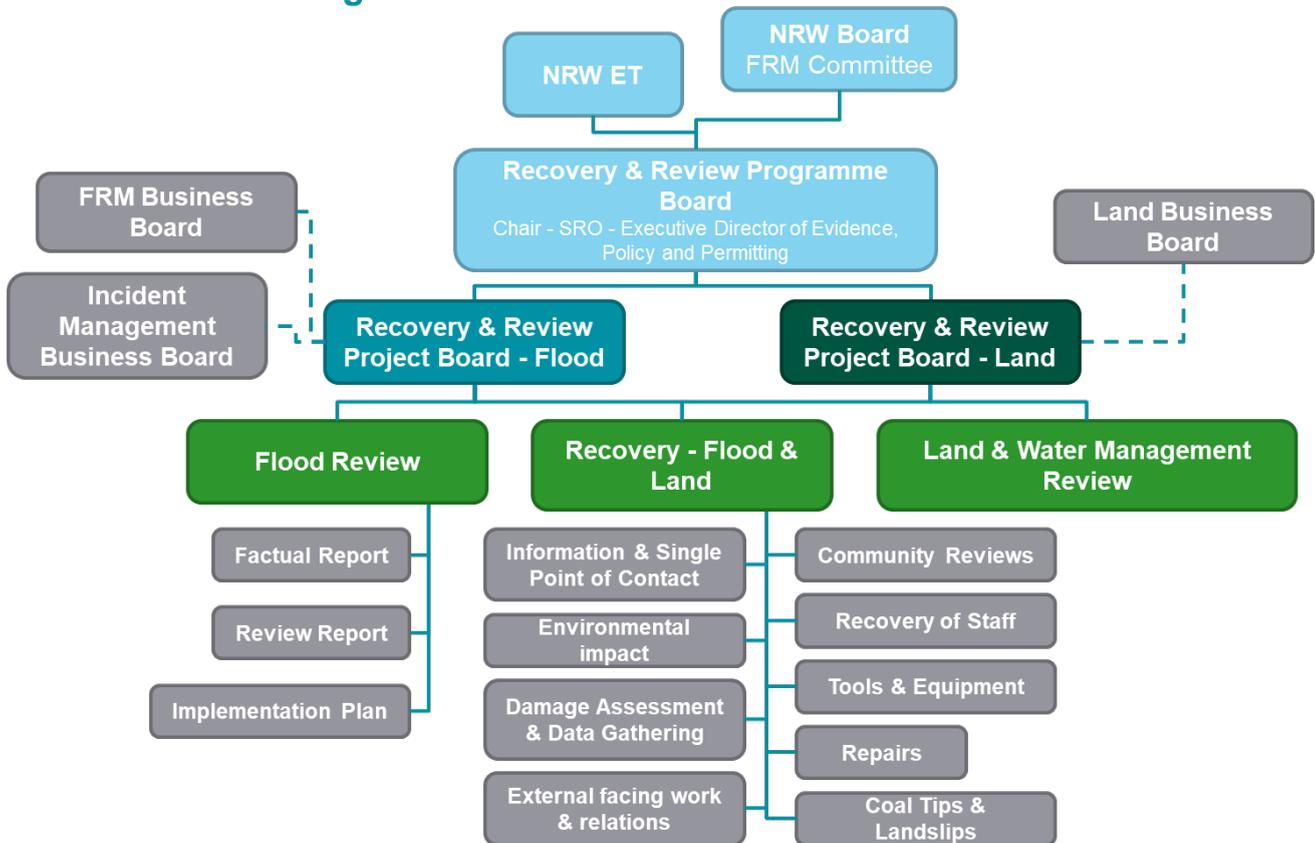
We have looked for opportunities to build relationships with local communities and support them to regenerate an area.

NRW Recovery Governance Structures

We put in place tight governance arrangements around our recovery as an organisation and for those people involved. Alongside this, arrangements were put in place to review the incident and learn lessons for the future, both from a flood incident management perspective and for the way we manage the NRW land estate.

The following diagram shows the governance arrangements in place and is described below.

Governance arrangements



- Flood and Land Recovery formed one of three projects within the programme. The others being the Flood Review and the Flood Review – NRW Land Estate.
- These are managed by two project boards:
 - the Flood Recovery & Review Project Board and
 - the NRW Land Estate - Flood Recovery & Review Project Board

We established a programme board, chaired by Ceri Davies (Executive Director of Evidence, Policy and Permitting) to oversee this work and drew on Flood Risk Management’s (FRM’s) own programme management experience. This was in addition to experience found in other reviews such as the timber sales review. This enabled us to put proportionate arrangements in place which use, as far as is possible, existing Governance structures.

Given the impact on NRW (as per section 2 above), the following workstreams were established under the recovery project:

Workstream	Objective
Damage assessment & data gathering	Gathering information (using our own staff, through commissioned assessments and shared information from the

	emergency services), about the extent of flooding, mechanisms of flooding and the extent of damage to defences and structures.
Repairs	Identification of immediate and longer-term repairs and the planning and delivery of these.
Information	Coordinating information management and supporting an efficient response to the significant volume of correspondence, including requests for information from AMs/MPs and the public, complaints and freedom of information requests.
Recovery of our own staff	Ensuring that staff involved in the incident, or those living in the communities affected by flooding, are supported in the short and long term.
External facing work and relations	Maintaining oversight of and supporting our work with partners, including Local Authorities and communities.
Tools and kit to do our role.	Immediate issues to resolve, which are affecting our capability in the aftermath of the event.
Environmental Effects	Ensuring that we will be able to understand the effects of the floods on the environment, including protected sites and ancient monuments.
Community Issues and Reviews	We have a Wales wide view of concerns and issues arising within communities. Where required, we take immediate action and learn lessons from any investigations and reviews to understand what happened and determine how we respond.
Coal Tips and wider Landslip Risks	We need to understand the impact of the floods on the land that we manage and any immediate investigations and actions that need to be taken to protect communities and the environment.

A Recovery Steering group was also established to maintain oversight and provide advice, reporting to the respective Recovery and Review Project Boards for Flood and the NRW Estate.

We also created measures and targets, at Appendix 2, to allow monitoring and reporting of progress towards our objectives.

Section 2 – Summary and next steps

Summary of the extent of our recovery

Ordinarily, the recovery phase should continue until the disruption has been rectified, demands on NRW and its teams have returned to normal levels, and the needs of staff affected (directly and indirectly) have been met. We are at that stage in many, but not all places. Indeed, true recovery for NRW may last for months, or even years given the scale of damage to the assets and the Welsh Government Woodland Estate (WGWE) that we manage.

This report provides a snapshot in time of our position. Sections 4 and 5 of this report (Workstream updates and Place summaries) describe progress made to date - by the end of June 2020 - and the extent to which we have recovered.

The table at Appendix 2 captures the first suite of recovery metrics against which we report progress.

The examples below illustrate the breadth of our work and the benefits achieved to date. They also illustrate why NRW and the people of Wales are already in a better place for any future flooding incidents.

The benefits of recovery

- Staff have been supported in their own recovery;
- whilst there is more to do, we are better prepared for future incidents. For example:
 - website scalability improvements already made to prevent website becoming overwhelmed during future incidents;
 - contingency plans and short-term arrangements are in place, while we continue work to repair, supplement, or enhance some of our systems, tools, and equipment;
 - we have made immediate changes to the flood warning process to reduce the likelihood of late flood warnings being issued in a similar significant event; and
 - we are better placed to handle and provide a consistent response to the volume of correspondence we receive because of our Correspondence Tracker and Flood Information Pack.
- We have undertaken inspection and maintenance of critical assets in proximity to properties and infrastructure across Wales to ensure they continue to operate effectively – for example flood defences, structures and high-risk assets on the NRW land estate, including coal tips;
- As a result, we have a clear picture of the damage incurred to our flood defences and structures and on the WGWE;
- We undertook repairs to several of our flood assets at locations including Abergele, Llanrwst, upstream and within Llanfair Talhaiarn, Ponthir, Usk town and on the Afon Elwy upstream of St Asaph.;
- We made urgent repairs to roads to allow continued access to Gethin Forest to ensure the road from the A465 to the Bike Park Wales visitor Centre remained open, and the forest road used to transport riders to the top of the hill was in good working order;
- We have enhanced our relationships with our partners, working closely with them including taking an active role in Rhondda Cynon Taf's Flood Recovery Group flood recovery group; and
- We have commissioned storm extent survey across the South East Valleys.

Summary of key outstanding work

The Recovery Action Plan at Appendix 1 outlines a wide range of key actions that remain to be addressed to ensure NRW's recovery. Responsibility for taking them forward is highlighted, with timescales (categorised as short term, medium and long-term actions) to allow continued tracking of progress.

This Action Plan has been collated from each workstream and summary updates from NRW's place-based teams¹ from Sections 4 and 5 below.

Examples of outstanding Recovery work include:

- finalising timescales for programmes to repair the damage to our flood and land assets, including short term running repairs and complete asset replacement, understanding the knock-on implications of this additional work, including for budgets;
- Hydrometry and Telemetry teams carrying out repairs to the river monitoring network;
- continuing to maintain oversight of, and support the management of, information around our recovery and review;
- play our part working with the Coal Authority, Welsh Government and partners to ensure that Coal tips and other legacy land slip risks are well understood and managed;
- continue to understand the environmental effects of the flooding working, with NRW's Knowledge and Evidence teams and external partners;
- continue to address urgent issues relating to staff skills and equipment being implemented through separate plans;
- work to address the resilience of rotas;
- provision of ongoing information, including to affected communities using innovative methods of engagement; and
- communications to staff around the recovery (alongside the reviews).

¹ NRW's structure is designed to deliver locally, while maintaining high standards across the whole of Wales. NRW's place-based approach focuses on seven place-based teams (including marine).

Next steps

While some workstreams have indicated the costs (including resource effort) incurred to date and likely in the future, further work is required to provide a summary of the financial consequences of the flood events for NRW.

Project boards will be asked to support the prioritisation of outstanding actions, as well as the review of Governance arrangements for those actions, which continue to fall under recovery and are not yet considered to be 'business as usual'.

Also, to consider how we monitor and report on our ongoing recovery (including work which has returned to usual business management) in the coming months and years.

Beyond recovery, there will be action to utilise flood extent information as appropriate for future flood schemes and strategy. We have begun the process of analysis and modelling to understand whether anything further could be done to reduce the risk of future flooding from main rivers. We of course recognise that many of the areas affected already benefit from sizeable flood defences and that any local decisions will need to consider the impacts they will have on upstream or downstream communities.

Section 3 – Identifying lessons

Capturing lessons during the recovery phase for further evaluation

Described below are the lessons we have identified from the recovery phase that will inform further action and improve our ability to recover from such incidents in the future.

This section has been informed by the following:

- Feedback on our recovery performance from a number of staff debrief events held across Wales and undertaken shortly after the events, as well as questionnaires completed by staff involved in the event;
- Three lessons workshops (two on 19 May 2020 and a third on 9 June 2020), led by the communications workstream lead;
- Recovery Steering Group members, views of Recovery Workstream Leads and those who reported on the challenges in each place; and
- Two recovery workshops (20 July and 23 July) designed to identify lessons we should learn a few months on from the events, and to reflect on our recovery since the recovery Governance arrangements were put in place.

We are grateful that staff took the time to contribute their thoughts to these sessions.

Participants were asked to consider the following:

- What went well, including what actions have we taken/ what steps have we put in place which will have legacy benefit?
- What didn't go well? and
- What improvements could be made?

A summary of feedback received is included below and provides a flavour of issues raised and lessons we should learn.

The lessons identified, and improvement ideas, have been shared with those leading the Flood Review and the NRW Estate Flood Review. These will inform future actions to ensure that we learn from past experiences and are in a better place for any future flood event. We will also share them with incident management colleagues to identify the issues that could be addressed to enhance NRW's incident preparedness and future recovery more generally.

Each proposal will be considered, and a process of validation and prioritisation will be required. From this, we will be able to assess how essential or aspirational proposals are. Ultimately, whether proposals are adopted may be influenced by decisions over the level of service for flood incident response that NRW should, and could, provide.

What went well?

- Individuals and teams have put in considerable work to date, and this continues. Thanks to these efforts, we have inspected all affected flood defences and structures, as well as the high-risk assets on the NRW land estate, and ensured that our spoil tips were safe;
- Immediate repairs have been made to flood defences, structures and the land that we manage, helping to protect people, properties and businesses while ensuring the safety of those using our estate;
- For the small number of coal tips impacted on the NRW land estate, work to address the remediation work identified was quickly commissioned and delivered, providing reassurance that our contracts were sound and working well;
- Funding was arranged quickly with the support of Corporate Services;
- All this was done against the backdrop of coronavirus restrictions;
- We are thankful for the culture of support, having seen a general willingness to help, even before roles became clear. There was good cross-working between issues on land management and direct flood response, as well as some strong examples of collaborative cross boundary and cross place working, with staff working well together to resolve issues;
- In the early days after the event, staff welcomed daily morning briefings by Flood Operations Managers which shared feedback from communities and brought a spirit of camaraderie during a difficult period;
- The emotional impact on staff was considered and measures were quickly put in place to support this;
- Good relationships with local partners were also emphasised;
- Governance arrangements were put in place, which resulted in good programme management and regular structured meetings and briefings. These enabled good oversight and provided a mechanism to manage risks and resolve issues where required;
- Some staff were taken offline to lead recovery and provide a single point of contact for correspondence;
- Development of a Flood Information pack was welcomed by staff and this aided the production of a consistent, professional, accurate and timely response to the multiple requests for information and correspondence received. The spreadsheet tracker allowed people to find related correspondence easily;
- Staff also welcomed the fact that we took time and set aside resources to reflect on our performance during the recovery phase as well as made a commitment to learn from it.

What were the issues?

- These were Wales-wide events which affected many areas and functions within NRW;
- While establishing clear Governance and putting people and processes in place was ultimately beneficial in terms of maintaining oversight and resolving issues, there was a delay in establishing this. Some felt that more could have been done to

raise awareness of this internally, with some operational staff reporting that they felt distanced from this structure and that it did not meet their needs.

- Concerns over resources were common, given the challenge of the same people dealing with multiple issues and requests. Staff came under significant pressure and felt there was an organisational reluctance to say 'no', with greater prioritisation required. It also impacted on individuals, raising concerns over their well-being, health and safety due to workloads;
- The extent to which support from the wider organisation could have been drawn upon was raised;
- The event also highlighted the need for role clarity following implementation of the new structure arising from the Organisation Design Change Programme and resource in some places, as well as the need for staff on rotas for other aspects of NRW business;
- The experience and expertise of our staff should be commended, but the event did highlight some weaknesses, including capacity issues in mid Wales and a lack of local, historic, geographical and technical knowledge in some areas;
- Post event survey work requirements and an approach to capturing this information were initially unclear;
- Early visual inspections were undertaken and emergency repairs took place on both flood assets and those on the NRW land estate. However, it took time to agree an approach to prioritise and start a programme of asset inspection quickly, as well as to capture the information accurately and consistently;
- Obtaining common information on flooded properties has proven difficult and there is no agreed approach to the development of Section 19 flood investigations;
- Expectations for NRW were high, fuelled by a lack of understanding about NRW's roles and responsibilities. Professional partners and the public did not always understand NRW's role in Flood Risk Management, what recovery means for NRW and the challenge that this presents to us as an organisation;
- Some drew attention to the accessibility of information on our NRW website, including finding what NRW's responsibilities are and whether a river is main-river or not;
- In particular, there were delays in updating NRW Webpages to reflect the event, to explain our response to the Storms, and to sign-post to helpful information;
- There was also a lost opportunity to get our messages out there quickly through the use of social media with more proactive messaging on what we were doing in the aftermath, what will happen next and the associated timescales;
- Staff on the ground involved in recovery felt they were not best placed - not sufficiently prepared, nor armed with the right information - to respond to the understandable need for information from affected local communities and the media;
- Questions were raised around how we prioritise multiple requests for engagement;
- In the immediate recovery and in the following months, the thirst for information was enormous. The sheer volume of correspondence, with no clear single route into NRW, presented a real challenge, with information received by many different areas of NRW (complaints, customer contact centre, Estates, CEO office, staff on the ground) and was initially captured and stored in various places. Many were complex requests with many layers of issues, making it difficult to assign correspondence quickly to those who needed to be involved in preparing a timely response;

- Welsh Government sometimes used staff's direct NRW account and by-passed the formal route, with some requests received more than once;
- Debrief sessions were well supported and we welcome the openness and honesty with which these were approached, but up-front clarity on who to involve in debriefs and a standard approach to these would be beneficial;
- Some staff expressed frustration that we had not learnt all the lessons identified in previous events and that the root causes had not been addressed; and
- While we know that some staff found the employee assistance package of support that we provided helpful, we are also aware that some of the sessions had limited or no attendance. Some staff highlighted that the sessions were not held in discrete enough areas of the office which risked putting staff off attending.
- In some places we have been unable to engage with flooded communities in the way we would have liked due to COVID-19, which also played a part in delaying inspection of assets. Staff would have appreciated more and earlier direction on what teams should be trying to undertake and how to do this during this period; and
- There were mixed views on whether we moved too quickly or too slowly to address concerns around the suitability of tools and equipment, given the ongoing COVID incident response and the pressure this placed on teams. Proactively allocating actions before appropriate groups had considered and prioritised them, caused concern over unmanaged work allocation and unrealistic expectations on staff.

Improvement ideas

All suggestions will be considered through appropriate structures and will be subject to confirmation, prioritisation and further decisions related to ownership of actions and timescales.

Undertaking and acting upon post-event staff debriefs

- Learn from these and previous events, through a full understanding of the root causes of issues;
- bring in a common approach to "Learning from events";
- ensure debrief sessions are recorded, and share all debrief sessions and questionnaires early to enable progress, while the collation and presentation of debrief information continues; and
- marry up those working on solutions with the appropriate business leads.

Coordination of Recovery - Flood and General Incident Management

- Clear Flood Recovery Plan/ handbook/ OI/ guidance, including:
 - Pre-prepared Governance arrangements, with clarity on the transition of management responsibility from incident, to recovery, to business as usual;
 - pre-defined actions, roles and responsibilities;
 - clarity of post event survey work requirements and an approach to capturing this information;
 - Framework contracts that need to be in place;
 - the coordination, resourcing and prioritisation of post flooding community events and appropriate training for these; and

– pre-event identification of what information is required to be reported on and in what format.

- We should carry out exercises and scenario planning including to test post-event recovery to better prepare for flooding events, involving a broad range of teams from across NRW;
- Capture skills and expertise of staff to draw upon for events;
- We could have daily post-event round-up meetings;
- Better recording and monitoring of the recovery of costs and the sources of funding;
- NRW to review and enhance (if required), our ability to respond to other types of incident, including irregular but foreseeable events, ensuring we have the skills, knowledge and capacity to engage and deal with them;
- Identify gaps in knowledge and skills and ensure these gaps are covered within our management systems, and act to enhance local historic, geographical and technical knowledge, including appropriate succession planning for potential future staff exits;
- Look to learn from other organisations to inform the level of service we could provide;
- Build on the relationship with Local Resilience Forum (LRF) partners during the COVID incident to further enhance our incident response and recovery.

Communications and post event community engagement

- It would be beneficial for media and communications colleagues to form part of a post event ‘task’ team;
- Provide clarity on our approach to engagement with affected communities, explaining how this compliments our partners and the package of support that is required to facilitate this approach;
- Put in place an approach for the management of community visits and events;
- Ensure proactive communications through the NRW website and use of social media to get clear messages and early approved external lines to the public. Clarity on responsibility for sign-off of messaging is also necessary;
- Consider development of material that can be shared with the public, providing information and signposting them to sources of help and advice;
- Enhance the number of suitable staff trained to carry out media interviews;
- Improve our internet and intranet information to raise awareness of our role in flood, enhancing the understanding of the level of service the public can expect;
- Reflect on how this meets the needs of customers, potentially through Customer Journey Mapping, and consider changes to the way we communicate the extent to which flood defences can provide protection;
- Engage with communities using a range of innovative means and channels of communication; and
- Explore how we can work better with Welsh Government and partner organisations to ensure a multi-agency recovery communications strategy.

Recovery Resourcing

- Review plans for the provision of sufficient resources for responding to a flooding emergency, including for recovery;
- Consider how NRW’s rota resilience could be enhanced;

- Review inspector resources across Integrated Engineering Teams, especially challenges in mid Wales and any further response to specific areas highlighted; and
- Seek additional support for Operations from within FRM teams and from the wider business and do so as early as is practically possible post event to ensure that support is used effectively where needed.

Dealing with Enquiries, Handling Information and Correspondence

- The Correspondence Tracker and Flood Information Pack have been put in place and these will continue to provide benefits if they are maintained and ready for future flood events;
- We need to have a clear process which explains how flood event correspondence is managed, such as being documented in an Operational Guidance Note or Desk Instruction; and
- Provide guidance to staff on where to turn if they are faced with questions around NRW's performance; raising awareness internally of the roles of Legal, Estates, Flood and Land Management as well as when and how to draw upon their support.

Staff Wellbeing and Support

- Plan for the evaluation of the Employee Assistance Programmes (EAP) sessions and take up of these to help inform the need for additional interventions;
- Ensure EAP sessions are held in discrete enough areas of the office;
- We recognise the importance of ongoing support given that people may not realise that they have been affected in some way until some time has passed;
- We learn from other responders; and
- Review plans for ensuring the welfare of staff through ongoing recovery.

Post event information gathering

- Greater collaboration and coordination with LLFAs when it comes to information gathering and investigation post flood event would be beneficial, including the production of s19 investigation reports; and
- A formalised process to capture and track information on flooded properties would be helpful.

NRW Land estate

- Work towards having an Asset Management Strategy in place to manage Land Drainage assets on the WGWE;
- Develop a planned, preventative maintenance programme to ensure high-risk assets are regularly inspected and improvements or modifications are identified;
- There should be a process in place to check the high-risk drainage assets when a heavy rainfall event is forecast and enable resources to be deployed;
- Review procedures to inspect drainage assets after felling operations have been undertaken (checking existing requirements of UK Forestry Standard); and
- Plans should be put in place to work with the Lead Local Flood Authority to share understanding of the land drainage assets on the WGWE and identify where a closer working relationship is required to work through any issues.

Section 4 - Overview of recovery workstreams

This section provides an overview of the current recovery situation in the form of the latest activity update reports compiled by the Recovery group from each of the workstreams.

Damage assessment and data gathering – flood

Workstream vision

We have a clear understanding of the damage to our assets - flood risk defences and structures - and the extent and mechanisms of flooding.

Summary of recovery

Definition of handover from recovery for this workstream

During the post-event visual inspection of assets, an assessment is made of their condition (in accordance with T98 standards²). A report is then submitted in the Asset Management expert (AMX) database. Part of the purpose of these reports is to flag any defects, which are allocated to the 'business as usual' teams for prioritisation and inclusion within relevant work programmes. This is an ongoing process, running in parallel with recovery, although some defects will take much longer to resolve - for example, if a significant fix is needed or capital investment is required. During the 2020 flood event, while some defences were damaged, no NRW defences failed.

Summary of recovery position

At end of June, this element of recovery is considered to be complete.



**Flood Assets
requiring
inspection**
2127

**Flood Assets
inspected**
2127

Percentage
100%

**Defects
identified**
131

² A T98 inspection is a national accreditation to undertake visual flood defence asset inspections. The accreditation was developed by the Environment Agency and the Flood Hazard Research Centre (FHRC) at Middlesex University. The assessment provides a 1 to 5 score for condition grade and is well-established throughout FCRM organisations in the UK.



**Figure 2
Map of Site
inspections**



**Figure 3
Map of
defects**

Recovery itself complete?

For the organisation to be truly recovered, the defects identified will need to be addressed. In some cases, this may take months, potentially years, particularly for those assets that need capital investment to bring them to their required condition. Again, as mentioned above, while some defences were damaged, no NRW defences failed.

What has been delivered so far?

Action	By Whom	By When
Initiate the gathering of information (using staff, through commissioned assessments and shared information from the emergency services), on the extent of flooding, mechanisms of flooding and the extent of damage to defences and structures, producing relevant reports.	Flood Risk Strategic Planning and Investment and Flood Ops Managers	26/02/2020
Develop a prioritised list of flood and land assets requiring inspection (T98 or otherwise), informed by highest river levels.	Flood Ops Managers	31/3/2020
Identify staff trained in T98 inspections and assess whether external contractor or EA support is required.	Workstream lead	31/3/2020
Establish plan to resource inspections in Mid-Wales	Workstream lead	30/4/2020
Schedule on AMX, tagging to the appropriate storm	AMX Administrator	17/4/2020
Record any assets inspected which are assessed "Below Required Condition" on AMX, along with the reason for this categorisation to inform repairs. Record these as defects and pass to BAU Teams.	Asset Inspectors	30/6/2020
Set up reports in AMX to a) identify where the inspections are being carried out in relation to the new 6 place structure and b) to track defects raised as part of February Storms Post Event Inspection	AMX Administrator	17/4/2020
Scope, tender with our framework suppliers and procure consultants to pull together the flood information gathered after Storm Dennis into a factual report.	South FRM	31/5/2020
Action plan to rectify data quality issues on AMX. For example, some defects not tagged to February Storms	Asset Performance Teams with Input from Integrated Engineering Teams	30/6/2020

Further work to do

Action	By Whom	By When	Status / Progress	Priority Rating
With the supported of consultants where required, bring together the data gathered in response to the February Storms and post-event survey work (extents and flood mechanisms)	Asset Performance Teams and flood risk analysis/ FIM	31/08/2021	South - Ongoing, Report being developed. North - complete	<i>High</i>
Utilise this flood extent information as appropriate for future flood schemes/ strategy	Asset Performance Teams and flood risk analysis/ FIM	Short, medium and long term	BAU	<i>High</i>

Costs

- An equivalent of six FTEs have carried out the inspections between late February and the end of May 2020. This equates to approximately £76k, based on the cost of Grade 4 staff. This does not include workstream management time.
- All defects will need to be addressed, and will need a range of interventions, from short term running repairs to complete asset replacement.

Impact on Performance and targets

- The measure: '**Maintain NRW flood risk management assets in high risk locations in target operating condition**' has a target of 98%. This means that if 70 or so assets are below their required condition, the measurement target is missed. Having reported in the region of 130 defects on post event inspections alone, and pre-storm performance being at 97.7%, this measure will be impacted by the February 2020 storms.

Repairs - Flood

Workstream vision

We have a clear understanding of the damage to our flood risk assets, have established recommended actions for each identified defect, and understand the funding required to bring those assets back to their pre-storm conditions.

Summary of recovery

Definition of handover from recovery for this workstream

Immediately following the events, emergency funding codes were set up (one for North and one for South) to deal with urgent requirements for repair and remediation work.

Following on from the work and processes mentioned in the *damage assessment and data gathering* workstream, the defects identified are assessed and then scoped out by the relevant Integrated Engineering and Asset Performance teams. Once they are fully scoped, they are included in either the relevant Integrated Engineering teams work programmes or the FRM Capital Programme via the project mandate process. This work will be in addition to the existing work programmes that have already been compiled and approved pre-event. Some defects will be clear cut fixes and will occur within the next 12 months, some will be deemed low priority and programmed into the next financial year, while some, particularly the capital funded projects, could be fairly significant and span multiple years. In other locations, the recommended action is to undertake modelling work leading to initial assessments. This work falls outside the scope of this project; however, it is important to highlight as, while these projects may take years to be developed and implemented, they are directly linked to the storms in question.

The successful handover from recovery to 'business as usual' for this workstream will be achieved once all identified defects have recommended actions programmed into relevant maintenance work programmes, and once capital project mandates have been approved and become official projects within the FRM Capital Programme.

Summary of Recovery position

All works that were deemed urgent and required immediate action have been completed with most using the Emergency Funding Codes that were set up in the immediate aftermath of Storm Dennis. While emergency repair measures are in place, some significant additional work is required, but this will take time to design the solution, as well as in terms of allocating funding and programming the delivery.

Following the inspections described in the *damage assessment & data gathering* workstream, all defects have been assigned recommended actions. With regards to recovery, these two factors were the most essential and time-sensitive. Everything that had to be done immediately, has been done. The third and fourth metrics below are

progressing well, with lower priority defects being the ones left to assess fully. We aim to complete this programming by the end of September 2020.



100%

Emergency repairs required completed



100%

Percentage of defects assigned recommended actions.



89%

Percentage of the identified repairs, which have forecast costs.



76%

Percentage of the identified repairs, which have programmed start dates or are deemed low priority and will be programmed for future years

Recovery itself complete?

No. Some fixes (11%) are yet to be fully scoped and costed, while 24% are yet to be programmed. As mentioned earlier, the majority of work will be in this year's work programmes, but some that are more complex in nature will possibly take many years to address fully.

What has been delivered so far?

Action	By Whom	By When
Emergency Funding Code set up to deal with the immediate aftermath of the storm.	Strategic Planning and Investment	18/02/2020
All defects raised to have recommended actions assigned.	Integrated Engineering and Asset Performance	April 2020
Defects assigned to a specific storm for ease of reporting	AMX Administrators	17/04/2020
All recommended actions to be assessed and given preliminary costs and start dates.	Integrated Engineering	89% costed 76% programmed (12/06/2020)

Further work to do

The vision of this workstream is to have recommended actions for each defect and likely costs and dates. However, as mentioned earlier in the report, many sites may not have immediate repairs to address, but there will be a need to understand what happened and

to consider how we can address the issues raised at those locations. Clearly some defences were not able to contain the sheer quantity of water. This will involve several initial assessments being undertaken that could lead to large capital costs in the future that are not captured as part of this workstream. For example, a model review of the whole lower reach of the River Taff is underway and will be the starting point for potential major capital works in the medium and long term.

Some capital projects such as Bangor-on-Dee are significant and will not be delivered by the place-based team in Operations. This project has been handed over to the Projects Delivery team and will span multiple years; other projects will require similar input. However, they will require significant input from place-based teams via the Senior User role and this is an important resource requirement to acknowledge.

There are still some small, low priority works to cost up and to factor into work programmes. Once that work is complete, the vision of this workstream will have been met. As above, we endeavour to forecast costs and programme all repairs by the end of September 2020.

Action	By Whom	By When	Status / Progress	Priority Rating
Continued development of recommended actions for each defect and likely costs and dates.	Place-based teams	Short term	Recovery	High
Address all considerable number of defects (emergency repairs, straight forward fixes and complex capital schemes), including some which have received temporary repairs initially. Achieve this through a range of interventions, from short term running repairs to complete asset replacement.	Place-based teams	Short, medium and long term	Emergency Repairs completed, hence BAU	High

Costs

Expenditure identified to date

- £1.9m of work identified to date;
- £1.5m of capital works on 19 projects;
- £400k of revenue works on 75 projects; and
- 11 projects yet to be fully scoped out and costed (an assessment of these defects suggests that these will be small scale, low priority, revenue funded works).

Although there are a small number of defects yet to be costed, they are unlikely to have much of an effect on the total sum identified to date - **£1.9m**. This is made up of small revenue projects as well as more significant capital works, ranging from £5k to hundreds of thousands. The larger projects such as Bangor on Dee are difficult to cost at this stage since an array of surveys will be required (ground investigation, structural, topographic etc)

to finalise these costs. However, the best possible estimates, based on previous experience and formal quotations from suppliers, have been fed into this report.

Implications of outstanding work

- Similarly to the damage assessment & data gathering workstream, there is likely to be an impact on the '**Maintain NRW flood risk management assets in high risk locations in target operating condition**' measure. More information on this is provided in the report for that specific workstream; and
- initial assessment work will now inevitably be focused on areas that have recently flooded. This could potentially take resource away from other areas already identified with the **FRM Medium Term Plan** as requiring assessment.

Damage assessment and repairs - Land

Workstream vision

We have a clear understanding of the damage to the high-risk land drainage assets on the Welsh Government Woodland Estate (WGWE), have established recommended actions for each identified defect and understand the funding required to bring those assets back to their pre-storm conditions.

Summary of recovery

Definition of Handover from Recovery for this workstream

Immediately following the events, some emergency works were carried out on the WGWE across Wales where key infrastructure needed to be repaired to allow access for forest operations and third-party access. These urgent repairs were facilitated by the area teams soon after the storm event and were funded by the annual revenue allocation provided to each place-based team.

Following on from this work, a process was put in place to identify where the high-risk land drainage assets were located so that engineering inspections could be carried out.

High risk is defined as being land drainage assets on the WGWE that could lead to flooding. These include those:

- that are in close proximity to homes, businesses and infrastructure that were affected by the storms;
- where we have received reports of damage to these assets following the storms; and
- that have the potential to cause damage if not maintained appropriately.

**information on where the high-risk assets are located was taken from GIS, local intelligence and by identifying areas which are at high risk of flooding from the flood map*

The asset inspections were carried out by a qualified civil engineer whose services had been secured from Forest England following a request for mutual support in completing the asset inspection programme. The engineer was accompanied by local area staff to the high-risk assets each team had identified.

The defects identified are assessed and then scoped before they are included in either the relevant Land Management teams' work programmes or in the Land Management Business Board funding allocation process. This work will be in addition to the existing work programmes that had already been compiled and approved pre-event. Some defects will be clear cut fixes and will occur within the next 12 months, some will be deemed low priority and programmed into the next financial year, while some, particularly the capital funded projects, could be fairly significant and span multiple years.

Handover from recovery to 'business as usual' for this workstream will take place when all identified defects have recommended actions programmed into place-based teams maintenance work programmes; and when capital project mandates have been approved and become official projects within the Land Management Business Board.

Summary of recovery position

Some works that were deemed urgent and required immediate action have taken place using area budgets.

A separate review is being undertaken to consider the issues and lessons that need to be learnt in relation to how NRW manages its forest estate following the February 2020 flood events.

Inspected assets and recommended actions

Following the identification of high-risk assets on WGWE, visual inspections of 173 assets have been undertaken at 35 sites. The outcome from these inspections is that:

- No action required to 23% (or 40) of assets;
- general Maintenance works required to 51% (or 88) of assets; and
- civils works required, including investigation and modification, to 26% (or 45) of assets.

Following the inspections, all defects have been assigned recommended actions. With regards to recovery, these two factors were the most essential and time-sensitive i.e. everything that had to be done immediately, has been done. The more significant repairs require further engineering assessment to fully understand the type and scale of repair required' – this is where we will need a more in-depth engineering assessment, so a scheme of work can be designed, costed and managed appropriately. We aim to programme repairs by the end of October 2020.



100%
(12)

Emergency repairs required completed.

100%
of
(173 at 35 locations)

Percentage of high-risk assets on WGWE assessed.

100%

Percentage of defects assigned recommended actions.

77%

Percentage of assets where action is required.

100%

Percentage of the identified repairs, which have forecast costs.

0%

Percentage of identified repairs, which have programmed start dates or are deemed low priority and will be programmed for future years

Reservoirs

Regarding the storms overall, the reservoirs held up, which is extremely reassuring given the priority assigned to this work in recent years. We have done a lot of work at various reservoirs over the last couple of years, which is continuing. A number of temporary repairs on breaches of dams, notably in Gwydyr forest, which are being maintained regularly (Pandora, Tynymynydd, Pen y Gwaith and Llyn Fuches Las). All these reservoirs experienced high flows and the spillways operated, which is quite rare, but no major damage was observed other than to the fish pass at Llyn yr Wyth Eidion (Anglesey) and to the temporary repair at Llyn Fuches Las, which overtopped (Gwydyr Forest). We have subsequently undertaken emergency repairs on both these sites, and there are capital schemes with design and investigation works underway. Construction is anticipated this autumn and next year respectively. We also had some significant impoundments at the likes of Gele, Trefriw, Almere & Plas Devon flood storage sites but no damage observed.

Recovery itself complete?

No - the arrangements (resources and money) for completing the fixes have yet to be agreed. It is envisaged that the majority of work will be delivered by the area teams via their annual work programmes. However, the repairs that are more complex will possibly take years to address fully and may require coordination at a national scale to ensure delivery is in line with best practice surrounding meeting governance and project management procedures.

What has been delivered so far?

Action	By Whom	By When
Welsh Government Woodland Estate high risk asset definition.	Workstream lead	31/05/20

Identifying the high-risk assets that were compromised during the storms or require inspection due to proximity to nearby properties and infrastructure that are at risk of flooding.	Workstream lead	01/06/20
Develop an asset inspection methodology that will ensure key aspects of the asset condition are collected.	Workstream lead	01/06/20
Appoint a qualified civil engineer to carry out the asset inspections.	Workstream lead	01/06/20
Produce a Damage Assessment Report that can be used to help plan the repair and replacement work programmes.	Workstream lead	26/06/20

Further work to do

The vision of this workstream is to have recommended actions for each defect and likely costs and dates. However, as mentioned earlier in the report, the delivery of the repairs, together with resources, funds and governance needed to facilitate this work, have yet to be agreed.

Action	By Whom	By When	Status / Progress	Priority Rating
Development of an asset inspection and maintenance programme for the WGWE akin to the approach taken in Flood - <i>Preparation of a master bridges record, and physical inspection of civil engineering structures.</i>	Land Stewardship BB	Medium – Long term	<i>Beyond recovery.</i>	High
Outline an approach for delivery, resolve resource and budget for repairs on the WGWE and ensure appropriate Governance arrangements are put in place.	Land Stewardship BB	Short - term	<i>This work needs to be coordinated beyond recovery due to the size, scale and governance arrangements required. Working with Projects Delivery on an approach for delivery.</i>	High

Costs

- **Expenditure identified to date***

- £7k of inspections;
- £800k of work identified;
- £650k of capital works on 10 sites; and
- £150k of revenue works on 23 sites.

**Costs are based on initial cost estimates, which RICS³ methodology suggest are only 40% accurate.*

The larger capital projects are difficult to cost at this stage since there will need to be an array of surveys (ground investigation, structural, topographic etc) undertaken to finalise these costs.

Implications of outstanding work

There is likely to be a severe impact on the resources of the place-based teams where repairs have been identified and delivered, hence planning and prioritisation will be undertaken.

NRW's coal tip and wider landslip risks

Workstream vision

We understand the impact of the floods for the land that we manage and immediate actions are taken to protect communities and the environment.

Summary of recovery

Definition of Handover from Recovery for this workstream

- Before the event, all 113 colliery legacy waste sites located on the Welsh Government Woodland Estate (WGWE) had an applied risk assessment. They also had an inspection contract with the Coal Authority (CA) and four high risk sites had a contract for local contractors to regularly assess their condition and remediate any issues found. During the event, it was recognised that there was no one consistent risk assessment used by all institutions across Wales. A new consistent risk assessment has been created and applied to NRW colliery assets. We continue to work with CA and Welsh Government (WG) to ensure this new assessment can be applied to all legacy industrial slip risk assets on NRW managed land as well as those sites for which we have a statutory responsibility. Other land stability issues on the Welsh Government Woodland Estate (WGWE) are being reviewed and

³ Royal Institution of Chartered Surveyors

previous research into identifying potential risk sites is being re-examined to ensure a better understanding of all NRW's risks.

Summary of Recovery position

- All non-routine emergency work to stabilise land on NRW land assets is complete. Further work is programmed but is not an emergency and is ongoing. This will include a review of our assets on the WGWE to prepare a long-term plan for any future required works where risks are seen as an issue. As a result, recovery is considered complete and all lessons learnt applied. There will be ongoing efforts to better understand and prepare for natural land instability, particularly when taking into account that a changing climate increases the risk of land instability due to changes in pore water pressures.



113

No. of Coal tips on WGWE



100%

Percentage of high-risk sites on WGWE assessed



100%

Percentage of other (lower risk) sites assessed



100%

Percentage of emergency remediation completed

Recovery itself complete?

- For the minor slips (many of which are unrelated to colliery or other legacy industrial waste), assessments have been made and any that pose a risk have been acted on to make them safe and to remove material that was blocking access. There remains some minor low-risk restoration of some sites across Wales. Further work to identify these risks is ongoing. As part of our monitoring and maintenance contracts, we are continuing the routine assessment of colliery and other legacy waste sites, as well as for some sites with geological instability that has very long-term movement issues. A review of all sites is planned, and this will develop a plan of future works to maintain the integrity of the assets.

What has been delivered so far?

- NRW reviewed its own managed land asset database. The majority of this applies to the WGWE. It identified 113 colliery waste related assets, all of which are in South Wales. Using NRW's risk assessment, all high-risk sites have been visited and assessed. Of the four sites that have been previously remediated by NRW, all have been inspected by a contractor with any required maintenance or actions

completed within days of the event. For all other higher risk sites, visits were undertaken by the CA and NRW staff. The regular checks through our contract with the CA were brought forward. Additionally, our geotechnical staff accompanied operational staff on several visits to higher risk sites and those where NRW had received reports of issues. All this information has been shared with WG, CA and other stakeholders involved in this work, as well as shared internally. Necessary remediation work was identified and acted upon.

- Although there were several minor land slips across the WGWE, the focus of efforts has been on two legacy colliery sites: the Pen yr Englyn tip and a reactivated but shallow slip (which overlies a much bigger but ancient natural failure) at Cwm Saebren. Both are close to Treherbert in the Rhondda. Remediation work was quickly activated at Pen yr Englyn while monitoring continues at Cwm Saebren. As above, for the minor slips, many of which are unrelated to colliery or other industrial waste, these have been acted on to make them safe and to remove material that was blocking access. Further assessment of the risk of natural slips across the WGWE continues.

Action	By Whom	By When
Identified the colliery waste related assets on the WGWE	Land Manager	Completed prior to event in Feb 2020
Liaised with RCT and offered assistance to them on sites off our estate.	Geoscience	Undertaken and Completed – March 2020
Assess all high-risk sites.	Geoscience	Completed - March 2020
Undertake any urgent required maintenance or actions.	Land Manager	Completed - March 2020
Plan and schedule any required other maintenance or actions and deliver in line with this.	Land Manager	Completed - March 2020
Consider implications for all legacy industrial sites on NRW Land.	Geoscience/Land Manager	Ongoing
Ensure these sites on our land have appropriate assessment and monitoring arrangements in place.	Coal Authority Contract/Land Manager	Contract already in place which proved effective in the event. Further research and investigations underway on non-industrial legacy sites. (Autumn 2020) New Wales wide risk assessment being applied (Autumn 2020).
Map all sites across Wales on land that we own or manage.	Land Manager	Completed prior to event in Feb 2020 New review commissioned via Service Plans

Further work to do

- We are currently working with WG, the Coal Authority (CA) and partners to construct more information about our at-risk sites. For us this includes all industrial legacy sites on the WGWE (particularly quarry and metal mine sites and not just colliery). We are also helping to establish a consistent Wales wide risk assessment for all at risk sites across Wales and asking WG to extend this to cover all legacy waste sites.
- This work goes beyond recovery to put NRW in a better position for future incidents by learning lessons from these events. This includes considering whether our incidents procedures can deal with non-regular events, as well as assessing whether our staff have the required skills, knowledge and capacity, and ensuring that we have arrangements in place for the longer-term transfer of knowledge.
- A report on legacy industrial waste sites on the WGWE is planned and this will identify what future works are required to both better understand the risks of these sites and outline any works required to ensure the risks are acceptable.

Action	By Whom	By When	Status / Progress	Priority Rating
<i>Work with Coal Authority/ Welsh Government (CA/WG) and other partners to improve knowledge of the location of all high-risk sites coal tip sites in Wales.</i>	<i>Geoscience</i>	<i>Autumn 2020</i>	<i>Progressing.</i>	<i>Low</i>
<i>Work with CA/WG and other partners to develop a consistent approach to their assessment.</i>	<i>Geoscience</i>	<i>Autumn 2020</i>	<i>Progressing in line with WG's priority for this work.</i>	<i>High</i>
<i>Influence WG & CA to include all industrial legacy sites in their risk assessment (to include not just colliery but also other sites such as opencast, quarry and metal and other mines).</i>	<i>Geoscience</i>	<i>Medium term</i>	<i>WG focussed on Colliery sites. Recognition now that work needs to expand to include other sites.</i>	<i>Med</i>
<i>Work across NRW to ensure our risk assessment, remediation and maintenance work, environmental harm mitigation, and event reaction on assets within the WGWE meet the</i>	<i>IMBB; Land Stewardship BB; EPP NRM & LSD</i>	<i>Autumn 2020</i>	<i>Work commenced</i>	<i>Med</i>

<i>agreed standard set from the planned review. This includes work to integrate NRW Estate incidents into the incident management. System</i>				
<i>Work across NRW to ensure the support we provide to other authorities is to an agreed level where our assets may impact their land, or where we are best placed to support work not related to the WGWE (e.g. risk assessment, environmental harm mitigation, event reactions, and remediation and maintenance work)</i>	<i>EPP NRM & LSD & FCRM depts.</i>	<i>Autumn 2020</i>	<i>Work commenced and ongoing.</i>	<i>Med</i>
<i>Work across NRW to ensure we undertake and deliver appropriate activity to deal with legacy metal mine assets that we are legally obliged to tackle.</i>	<i>Geoscience</i>	<i>First tranche of high-risk sites March 2021</i>	<i>Progressing well on a risk assessment basis - as identified in the Metal Mines Strategy (i.e. top 50 high risk sites from the 1310 Wales metal mine sites)</i>	<i>High</i>
<i>Assess low-risk sites and the scale of further works that may be required on coal slips/tips on the WGWE</i>	<i>Integrated Land & Asset Managers and Projects delivery</i>	<i>Short term</i>		<i>High</i>
<i>Plan and schedule any required other maintenance or actions and deliver in line with this</i>	<i>Integrated Land & Asset Managers and Projects delivery</i>	<i>Medium term</i>		<i>High</i>

Costs

- All work to date has been covered through existing contracts and budgets, and within existing operational costs. To date, there are no proposals required to undertake major remediation works at legacy colliery sites on the WGWE. If the

proposed review or ongoing risk assessments identify the need for major remediation at any of NRW's assets, major budgetary provision would be required. NRW's current Metal Mine Remediation programme is tackling some waste issues via WG funding (2020/21 costs of £4.5 million); and a similar programme would be needed for at risk colliery waste sites, through WG financial support, should this be deemed necessary.

Implications of outstanding work

- Currently no major works are outstanding that relate to NRW's colliery waste assets. A considerable long-term programme of work is underway at several metal mines across Wales.

Information and single point of contact

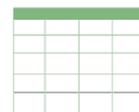
Workstream vision

We reply to all 2020 flood event correspondence with professional, accurate and timely responses, with common messages produced to facilitate the replies to correspondence. Lessons have been learnt and changes implemented to ensure proactive messages are used to get the facts right and dispel rumours.

Summary of recovery

Definition of Handover from Recovery for this workstream

Handover will be when the Correspondence Tracker and Flood Information Pack are handed over to the business to manage and are achieved.



Single Point of contact to manage approach. Develop consistent messages

Replied to 150 key flooding correspondence.

100% correspondence and requests for information received have received a holding response.

100% correspondence and requests for information received have received a substantive response.

Tracking spreadsheet to help ensure replies are timely and accurate.

Flood Information Pack to provide key information and lines to take/

Summary of Recovery position

The Correspondence Tracker and Flood Information Pack are both in place and need to be maintained as we receive more correspondence.

- **Recovery itself complete?**

No. We are still receiving flooding event correspondence.

What has been delivered so far?

A Continuous Improvement Senior Specialist Advisor was appointed as the single point of contact for all key flooding correspondence* on 2 March 2020. This role was put in place after the flood events to ensure that we are giving consistent messages to the government, stakeholders and partners. Heads of Place stay as the responder for local issues to maintain ownership and to strengthen our relationships with AMs and MPs.

Prior to having a single point of contact, there were many issues: complex requests, tight deadlines, multiple ways that queries were received by NRW, multiple people involved in replies, not knowing who should respond, multiple tracking sheets or no tracking, multiple approvers and potential inconsistencies and delays.

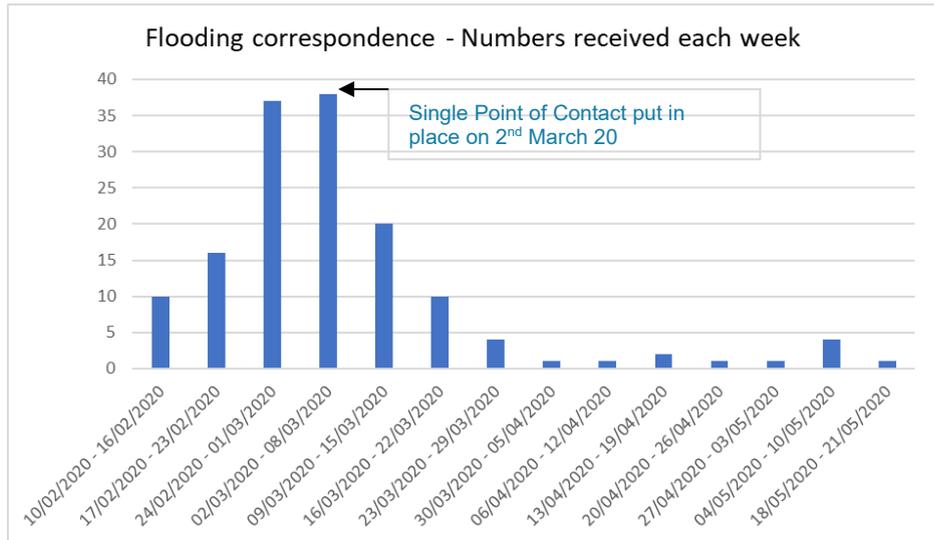
* Key flooding correspondence includes: Welsh Government requests for information, media inquiries, correspondence from flooded and concerned residents or businesses, complaints, Access to Information requests, data requests and requests for meetings and visits. There are other e-mails and letters which go directly to staff.

We have produced the following products to help staff efficiently respond to correspondence:

- **Correspondence Tracker** - A single log of all key correspondence with links to the questions and answers. This is on a secure location of DMS.
- **Flood Information Pack** – This is a lengthy document which includes the following information to help staff reply to correspondence:
 - Rolling Brief – two-page summary of key messages;
 - key Facts/Statistics;
 - summary table of who responds to what correspondence;
 - Question & Answers;
 - community specific Information; and
 - Position Statements – Dredging, Reservoirs, Land Management etc.

We have worked with internal NRW Teams (Communications, Customer Hub, CE Office, Operations Teams and Legal) to create an efficient process to ensure an accurate and timely response to all correspondence relating to the 2020 flood events.

The graph shows the amount of key* flooding correspondence we received each week. To date, we have captured 150 pieces of key flooding correspondence and at the peak, we were receiving 38 complex correspondence requests a week. The majority of these were going to the Customer Hub and Chief Executive's Office.



*Numbers do not capture the considerable number of additional requests that went directly to local-based teams and that were dealt with by them without central support. While they drew on the information within the Flood Information Pack to ensure a consistent response, further tracking of this was felt to have presented an additional burden with limited benefit.

We have identified the need to learn from this event and further consideration will be given to how correspondence is managed during future events.

The table below shows the actions and key dates.

Action	By Whom	By When
Agree process for replying to correspondence	Workstream lead	16/3/20
Set-up Correspondence Tracker	Workstream lead	02/3/20
Create Flood Information Pack	Workstream lead	16/3/20
Workshop to identify lessons	Workstream lead	19/5/20

Further work to do

We will continue to maintain and update the correspondence tracker and Flood Information Pack.

Action	By Whom	By When	Status / Progress	Priority Rating
Continue to maintain and update the correspondence tracker and Flood Information Pack.	Lead Specialist Advisor, Strategic Planning and Investment	Short, medium and long term	Ongoing	High

Environmental Effects

Workstream vision

We want to understand what the effect of the Storm Ciara and Storm Dennis flooding events have been on the environment.

Summary of recovery

This workstream is less about recovery itself. Rather, it is about gathering evidence as soon as possible after the event to inform future remediation action or management approaches for the most vulnerable sites and features, as well as to aid future prioritisation.

Disturbance of Freshwater ecosystems by floods is a natural process for many ecosystems and plays an important role in creating and regenerating habitats. However, extreme flood events may cause irrevocable damage to ecosystems, pushing them beyond the point of recovery.

The Programme Board requested that we create an additional recovery workstream to look at the impact of these floods on the environment.

While it would take time to fully understand the long-term impact, we wanted to:

- ensure our initial assessment would ideally be part of the historical record, complimenting the Phase 1 factual report on the scale of the event and its impact (but it became clear early on that these timescales would not be feasible);
- to understand the impact of the floods on the environment, protected sites and ancient monuments, including the extent to which Nationally and Internationally important conservation sites and their features have been affected; and
- enable responses to correspondence on this subject, around the environmental damage caused by the fluvial flooding.

Proposed Approach

- Social media footage of the event has already been collated. This is likely to provide a useful visual evidence base, such as for land slips and bank erosion;
 - we agreed our first steps would be to:
 - Obtain mapped information on the flood inundated areas; and
 - Overlay these with the designated sites, habitats, species, land use and characteristics of interest;
- armed with this information, we can then determine what we might do next. It will give us an indication of what may have been affected, which could be further studied (for example, to understand habitats and species most vulnerable and to aid future management). It will enable discussion regarding whether we are able to

obtain before and after evidence, which can help us to assess the effects in more detail;

- we will develop options for further work, factoring into this the implications of COVID 19 restrictions for field assessments; and
- we anticipate making use of satellite imagery - for example, to see the extent of inundation and where erosion has eaten into NNRs and other sites.

What has been delivered so far?

- We have met twice with members of the Knowledge and Evidence team to discuss the scope of the project and develop options to present to the Programme Board, which informed the approach above;
- the work has been affected by the impact of COVID 19 restrictions on field assessments and the problems in evaluating something that we did not plan to do;
- no workstream lead has been identified; and
- flood inundation maps are not yet available and in South Wales, these will not report until August 2020.

Further work to do

- Obtain flood inundation maps to develop boundaries for assessment;
- identify sites and features of interest, with a view to overlaying relevant GIS layers;
- develop options for a way forward and potential options for further assessment;
- check flood evidence and research gaps identified within SoNaRR, determining whether research around this event could address these; and
- approach the Environment Platform to identify Welsh universities working on the environmental impacts of the February 2020 flooding in Wales.

Action	By Whom	By When	Status / Progress	Priority Rating
Continue work to understand the effects on the environment.	Multiple specialist input including Lead Specialist Advisor, Monitoring Analysis	End of 2020	<i>Ongoing</i>	<i>Med</i>

Recovery of our staff

Workstream vision

Provide an Employee Assistance Programme (EAP) Package of Counselling support for those dealing with the challenges of the incident.

Based on staff feedback, coordinate further support to give staff space to deal with the response.

What has been delivered so far?

Support provided to date includes:

- Care First on site Counselling - drop-in sessions to allow anyone the opportunity to talk, reflect on the decisions they've made, what they've seen, what they've experienced;
- CareFirst webinar/Skype sessions on trauma - an awareness session, which explained what trauma looks and feels like, how they might feel as well as tools for help and support;
- to reduce other pressures on Flood Risk Staff involved in recovery, we also requested amendments to the external NRW website to manage customer expectations regarding timescales for the response to correspondence, information requests and complaints. The customer Hub also confirmed the potential for delayed responses over the phone; and
- the successful conclusion of the Allowances Review will bring clarity over future pay arrangements for standby, call out, overtime, staff retention measures - market forces factor.

Further work to do

We must continue to point people in the direction of support further down the line. This will be even more important as we face the challenges brought by Coronavirus, with many of our teams working at home, social distancing or self-isolating. The NRW's Employee Assistance Program (EAP) with Care First is available to all staff, providing professional, confidential, voluntary counselling and other assistance.

Further work is underway to ensure the resilience of rotas. This includes bolstering staff numbers through a 'call for volunteers', and working on the allowances review, which is now being implemented following consultation with staff.

Tools and equipment to do our job

Workstream vision

We have the right tools and equipment to do our job and we address feedback around the suitability of tools and equipment.

Summary of recovery

Definition of Handover from Recovery for this workstream

Handover from Recovery would ordinarily be complete when any tools or equipment damaged by, or during the flooding events over the winter, have been repaired or replaced. However, based on the feedback provided by colleagues, we are looking to respond to concerns around tools and equipment which could be improved for future use. Therefore, recovery will be complete only when we can be confident that we are in a better place to recover from similar events in the future as sufficient practical issues flagged by staff have been addressed. These include concerns with ICT, mobile phones and fleet. There is a continuum here and some more substantial issues will be addressed as part of the flood review.

Summary of Recovery position

Website scalability improvements have already been made to prevent the website from becoming overwhelmed during future incidents. Contingency plans are in place while we develop medium term solutions for tools and equipment which staff feedback has told us could be improved for future use. Despite our efforts, limited practical difference will yet be felt by staff on the ground. To ensure continued focus, a sub programme of work has been established to manage the process. A Lead Specialist Advisor (Commercial) will oversee this work drawing on their previous experience in a number of roles in the Corporate Services team.

Recovery itself complete?

No, though much of this work is focused on enhancements beyond recovery. We have put contingencies in place as soon as possible and all short-term solutions are set to be in place by end of September 2020.

What has been delivered so far?

Over the weekend of 15 and 16 February 2020 during Storm Dennis, the NRW website received an unprecedented number of hits. The website failed to respond on two occasions and performed poorly. A detailed Hot Debrief has been put together to feed into the wider flood review and the tactical actions for ICT were developed to provide a four-month improvement plan across:

- Website priorities and improvement work;

- ICT Out of Hours response, roles and major incident management;
- testing, monitoring and review; and
- tools, offices and hardware

As detailed above, website scalability improvements have already been made to prevent the NRW website from becoming overwhelmed during future incidents. A long-term strategic plan is being drafted to deliver a Target Operating Model for the website looking ahead to 2023.

For tools and equipment, a number of work packages have already been established with named leads in place for each. These individuals are working with business reps - colleagues who can provide clarity on the specific problems and to refine requirements.

Action	By Whom	By When
Debrief information, including ICT debrief, collated and reported.	Lead Specialist Advisor Incident and Emergencies, Flood and Operational Risk Management	31/03/20
Debrief information allocated to Recovery.	Flood R&R Project Board	21/04/20
Website scalability issues addressed.	Contractor - ICT Development & Innovation Programme	31/03/2020
Develop metrics to allow better visibility of the extent of progress that has been made and whether actions against milestones are on target.	Recovery Manager	08/06/20
Appointed PM for Tools & Equipment workstream.	Recovery Manager; Head of ICT	15/6/20
Identified business leads for each workstream.	Head of ICT	15/6/20
Contingency plans developed.	Workstream leads	15/6/20
Development of workarounds/ short term interim fixes identified.	Workstream leads	In progress - ASAP

Further work to do

Tools & Equipment issues need to be addressed with some pace by work package leads working with the business.

Action	By Whom	By When	Status / Progress	Priority Rating
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Work package 1: Having clear contingency plans and business continuity processes that prioritise key services.	Recovery Manager; Workstream Lead; Manager, National Flood Risk Services; Ops; ICT & Comms	Short term	<i>In progress – Recovery</i>	<i>High</i>
Work package 2: Our website is more resilient and able to cope with increased traffic during an incident.	Workstream Lead; Contractor - ICT Development & Innovation Programme	Short term	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>
Work package 3: Our Incident rooms are suitably equipped.	Workstream Lead and Team Leaders for Deskside Support (ICT); Facilities South and North	Short term	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>
Work package 4: Mobile phones are sufficiently robust for extreme weather and staff know how to use them.	Workstream Lead; Team Leader, End User Device Management (ICT); Specialist Advisor, Business Services (ICT)	Short term and medium term	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>
Work package 5: Risks around network coverage of mobile phones are mitigated.	Workstream Lead; Team Leader, End User Device Management (ICT);	Short term and medium term	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>
Work package 6: Plant and fleet, and their logistical management, support our response to storm events	Workstream Lead; Team Leader, Facilities & Fleet Technical Assets	Short, medium and long term	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>

Costs

No information on costs incurred to date, or future potential costs is available yet.

Implications of outstanding work

This work is critical to ensure that staff are in a better place to respond to similar incidents in the future. The Tools & Equipment sub-programme will maintain oversight of this work and provide assurance to the Recovery & Review Project Boards.

External relations and community reviews

Workstream vision

We have oversight of, and support, NRW's work with our partners, including Local Authorities and communities, ensuring we have captured issues arising for NRW with plans in place to address these.

We have a Wales-wide view of concerns and issues arising within communities and, where required, we take immediate action, learning lessons from any investigations and reviews to understand what happened and determine how we respond.

We contribute information to Section 19 investigations carried out by the LAs, so that these are collaborative and have the objective of learning lessons and getting improvements.

Summary of recovery

Definition of Handover from Recovery for this workstream

When there are no further Wales-wide issues to be raised and addressed.

Summary of Recovery position

This work is moving to 'business as usual'. Place leads will continue to update the Recovery Manager when there is an update available for individual communities.

Recovery itself complete?

For NRW to be fully recovered, all input to Section 19 reports, all community reviews and all engagement with flooded communities will need to be complete. This is likely to take many more weeks and months.

What has been delivered so far?

We have worked to obtain a central view of the asks of NRW, the commitments we are minded to make and the actions we need to plan for. We have identified where join up is required, ensuring consistent messaging (through the information workstream). We have looked for a consistent approach to NRW's response and offers of support.

We have worked to confirm a clear pan-Wales picture of the issues arising for NRW within communities. Owners of those issues regularly report on the situation to enable country wide sharing of best practice, identification of wider lessons for NRW and a consistent response.

Updates on the position within communities are included within the summaries for each of NRW's Place-based teams separately.

Meetings with flooded communities have been undertaken by local-based teams but this has been limited by the ongoing COVID-19 situation. To date, we have engaged with the following communities:

- Osbaston;
- Skenfrith;
- Taffs Well;
- Nantgarw;
- Pontypridd;
- Blaenllechau;
- Mountain Ash; and
- Llanfair Talhaiarn.

Place-based teams have also been liaising with LLFAs on the delivery of Section 19 flood reports. NRW will be contributing to the production of these reports where needed.

We are currently aware of the following Section 19 reports being developed:

- Caerphilly;
- Monmouth;
- RCT;
- Conwy; and
- Powys.

While a formal S19 review in St Asaph isn't taking place, we have been in regular contact with Denbighshire CC regarding the flooding in the county and the way forward.

Again, further details on this workstream can be found in the summaries of each place in Section 4 below.

Further work to do

Community engagement is needed in some of the areas that experienced flooding from the storms in February 2020. Our ability to engage is being impacted by the ongoing COVID-19 situation but communities do still need contact to ensure they do not feel forgotten. An all Wales approach and messaging from key personnel is needed to help get

key messages into communities, as well as a plan for how this can be delivered. At Pentre and Mountain Ash in South Central Wales, our own review will support investigations led by RCTCBC, which are currently underway, to establish the cause of flooding at these locations. This is a substantial piece of work, given the breadth and extent of the flooding event. When complete, NRW will substantively respond to the correspondence received to date.

Action	By Whom	By When	Status / Progress	Priority Rating
Community engagement/ communications as needed in some communities that experienced flooding from the storms in February 2020	Flood Ops Managers and Communications	Short term	BAU	

Implications of outstanding work

Responding to and addressing flood risk is business as usual for the FRM teams. The flooding has meant reprioritisation of the work that was being undertaken to enable responses to community queries and community engagement. COVID-19 continues to have a significant impact on the way we engage with communities following flooding.

Section 5 – Summary by place

This section collates stand-alone summaries from each of NRW's Head of Place-based Operations teams. As such, there is some repetition of information and there are differences across Wales depending on the focus of work at the time. It provides a snapshot in time of the issues arising and work underway at the end of June. Considerable work is ongoing. Key outstanding issues have been captured in the Action Plan.

South East – FRM and WR

Summary of key Communities affected in South East

- Key communities affected by flooding from main rivers in South East were in Skenfrith and the undefended areas of Monmouth, particularly the caravan park and Forge Lane;
- Skenfrith is undefended and was evacuated, as were the residents of the Caravan Park in Monmouth. Two severe flood warnings were issued for the latter. Flooding also occurred in several locations like Nant y Aber, Bedwas, Llanbradach, Duffryn Estate, and Tan y Bryn; and
- there have been no reports of failing assets on our WGWE in the SE as a result of the storms.

Local Actions in those communities

Local actions undertaken at all locations affected by main river flooding include:

- Staff have been visiting all locations impacted to check on and speak to residents, provide advice and gather information and data regarding the sources and onset of flooding as well as the impacts (e.g. numbers of properties flooded, depths of flooding);
- We carried out two drop-in sessions with flood victims from Skenfrith and Forge Lane (Osbaston);
- We have brought in consultants to support the gathering and recording of the flood event and impact data to ensure we capture all evidence while it is still available;
- Immediate informal inspections were carried out on the rivers and defences in the areas impacted by flooding in order to record the condition of flood risk assets and check on river channels for blockages or damage. Information was fed through to the local Integrated Engineering and Workforce Teams so that our assets could be repaired to remain fit for purpose. Some of the repairs have/will be temporary initially;
- Asset Performance staff have supported the Integrated Engineering Team to undertake formal T98 asset inspections to ensure that our flood defences remain fit for purpose. Any damage and necessary repairs are recorded so that they are included in maintenance and capital programmes; and
- Staff responded to much correspondence with Councillors, SMs and MPs to address local matters.

Actions taken regarding WGWE assets:

- In conjunction with other Places, SE have been identifying communities who would be most at risk should asset failure occur in the WGWE, focusing on these.

Issues you faced in those communities

Two main themes have recurred during the period following the flooding:

“Why did we flood?”

- Staff have spent a lot of time speaking and corresponding with residents affected by the flooding to explain that the cause of the flooding was the exceptional rainfall, using actual and historic data to explain how the rainfall was of record levels. Very often, they have not been believed.

“What will be done to stop it happening again?”

- This question has expectedly come up again and again. We have spoken to many residents, SMs and Councillors who all are asking this. We have advised on the extreme nature of the event and explained that our initial priority is to get the flood defences and river channels back to pre-flood status. Once this is complete, we will then start to look at what can be done to reduce the risk. We have explained that many of the areas affected already benefit from sizeable flood defences and that any local decisions will need to consider the impacts they will have on upstream or downstream communities, as well as acceptability and feasibility in the community affected.

Orphaned Assets

- Another issue that seems more specific to SE, although it does apply to other Places too, is the issue of ‘orphan’ assets (where ownership of infrastructure assets is unclear) on main rivers. There are a variety of these in the patch, and some of them have failed during the storms. Some properties have flooded as a result, and we have received a number of complaints about these. There is currently no provision for NRW to ‘adopt’ these assets. There is a need to clarify WG Policy on the ‘adoption’ of ‘orphan’ assets on main rivers and the resources for them to be maintained.

Things you have successfully addressed

- We have spoken with residents in most communities impacted by the flooding;
- we are working with the Local Authorities to share information on flooding and impacts, using this information to inform our flood review;
- to ensure all evidence is captured while it is available, the use of consultants to support the gathering and recording of the flood event and impact data has been significantly important. Much of the data would have been lost without this approach;
- we have supported the inspection of all NRW flood defence assets since the storm events in February to ensure that they remain fit for purpose in the event of another

- flood. We have identified and recorded any damage and are working with the Integrated Engineering and Workforce Teams to facilitate repairs; and
- our Development and Flood Risk Team has been ensuring that we enable emergency repairs on our rivers by others (private/public authority). This has been made possible through the provision of timely expert advice and where appropriate, Flood Risk Activity Permits (FRAPs), while ensuring no detriment to the environment because of such work.

Outstanding issues

- Several public meetings were requested following the flooding. The subsequent COVID-19 working arrangements and policies have prevented many of these from happening. Further community engagement will be necessary once government and health advice allows.
- There is a significant outstanding policy matter regarding improvements to flood defences, which already provide the normal indicative standard of protection against a 1% (1 in 100) annual event. Dialogue between the Welsh Government and NRW Policy Team is required.

Summary of extent to which you have returned to Business as Usual

Dealing with floods and their impacts is 'business as usual' for us. In terms of fitness, the teams have had time to rest and recuperate.

South Wales Central flood risk

Key communities affected by flooding from main river in South Operations were:

- Ynysybwl;
- Britannia (Porth);
- Trehafod;
- Pontypridd;
- Treforest;
- Nantgarw; and
- Taffs Well.

These are the main locations; other locations across South Wales Central were flooded but lower numbers of properties were impacted.

Local actions you took in those communities

Local actions undertaken at all locations affected by main river flooding include:

- Staff from across the whole department have been visiting all locations impacted to check on and speak to residents, provide advice and gather information and data regarding the sources and onset of flooding as well as the impacts of the flooding (e.g. numbers of properties flooded, depths of flooding);

- we have brought in consultants to support the gathering and recording of the flood event and impact data to ensure we capture all evidence while it is still available;
- immediate informal inspections were carried out on the rivers and defences in the areas impacted by flooding in order to record the condition of flood risk assets and check on river channels for blockages or damage. Information was fed through to the local Integrated Engineering and Workforce Teams to ensure that our assets could be repaired to remain fit for purpose. Some of the repairs have/will be temporary initially;
- Asset Performance staff have supported the Integrated Engineering Team to undertake formal T98 asset inspections to ensure that our flood defences remain fit for purpose. Any damage and necessary repairs are recorded so that they are included in the maintenance and capital programmes;
- attended site visits and meetings with the Chairman and Chief Executive in Taffs Well, Nantgarw and Pontypridd to meet and speak to many residents and hear their concerns; and
- responded to much correspondence with Councillors, SMs and MPs to address local matters.

Issues faced in those communities

Two main themes have recurred during the period following the flooding:

“Why did we flood?”

- Staff have spent a lot of time speaking and corresponding with residents affected by the flooding to explain that the cause of the flooding was the exceptional rainfall. There have been many local rumours about reservoir releases and the Cardiff Barrage being the cause of the flooding. Staff have spent a lot of time explaining to a lot of people that the flooding was purely due to the rainfall and have used actual and historic data to demonstrate how the rainfall was of record levels. Very often, they have not been believed.

“What will be done to stop it happening again?”

- This question has expectedly come up again and again. We have spoken to many residents, SMs, Councillors etc who all are asking this. We have advised on the extreme nature of the event and explained that our initial priority is to get the flood defences and river channels back to pre-flood status. Once this is complete, we will then start to look at what can be done to reduce the risk. We have explained that many of the areas affected already benefit from sizeable flood defences, and that any local decisions will need to consider the impacts they will have on upstream or downstream communities, as well as acceptability and feasibility in the community affected.
- Another matter raised was around the timeliness of our flood warnings for Nantgarw. We have spoken to residents there and explained that flood warnings were issued late due to our flood warning processes being stretched beyond normal circumstances.

Things you have successfully addressed

- We have made immediate changes to the flood warning process with the aim of reducing the likelihood of late flood warnings being issued in a similar significant event;
- we have spoken with residents in most communities impacted by the flooding;
- we are working with the Local Authorities to share information on flooding and impacts, using this information to inform our flood review;
- to ensure all evidence is captured while it is available, the use of consultants to support the gathering and recording of the flood event and impact data has been significantly important. Much of the data would have been lost without this approach;
- we have supported the inspection of all NRW flood defence assets since the storm events in February to ensure that they remain fit for purpose in the event of another flood, identifying and recording any damage and working with the Integrated Engineering and Workforce Teams to facilitate repairs;
- our Development and Flood Risk Team has been ensuring that we enable as many emergency repairs as possible on our rivers by others (private/public authority). This has been made possible through the provision of timely expert advice and where appropriate, FRAPs, while ensuring no detriment to the environment because of such work; and the whole department has been involved in responding to the plethora of emails and letters following the February storms.

Outstanding issues

- Several public meetings were requested following the flooding. The subsequent COVID-19 working arrangements and policies have prevented many of these from happening. Further community engagement will be necessary once government and health advice allows; and
- There is a significant outstanding policy matter regarding improvements to flood defences, which already provide the normal indicative standard of protection against a 1% (1 in 100) annual event. Dialogue between Welsh Government and NRW Policy Team is required.

Summary of extent to which you have returned to Business as Usual

- Responding to and addressing flood risk is 'business as usual' for the FRM teams. The flooding has meant reprioritisation of the work we were doing. COVID-19 has had a significant impact on the way we are delivering the business.

South Central - South Wales Central Land & Assets

A summary of the extent to which South Wales Central has recovered:

Pentre:

- Some residents have made claims over flood damage in response to properties being flooded when the culvert and grid were damaged on the Welsh Government Woodland Estate at Pentre;
- we are undertaking a Pentre Review of what had occurred on site in the forest, giving an independent assessment of the causes and actions or lessons that may be learned from a forestry/harvesting point of view. The outcome of our review will be shared with officers from Rhondda Cynon Taf (RCT) as well as with the community;
- an investigation of culvert maintenance and ground conditions of the land and forestry above Pentre is continuing;
- we are working alongside officers from RCT to design and construct a new grid on the culvert. We hope for work on site to start in November;
- regular inspections are being carried out on the grid to ensure there are no blockages and the stream can flow freely. The frequency of these inspections will increase when there is a heavy rainfall alert; and
- we are continuing to correspond with local elected politicians about the review and have talked through our plans to engage with the people in Pentre, to share our findings. Chris Bryant MP has offered to take part in these events.

Blaenllechau:

- Some residents have raised concerns over flood damage;
- we continue to look into the land management practices, culvert maintenance and ground conditions of the land and forestry above Blaenllechau. The outcome of this review will be shared with officers from RCT as well as with the community;
- due to the nature of the run-off that occurred, we have worked closely with the Coal Authority and have asked them to undertake an assessment of the land to consider any historic mine workings that may have influenced the site drainage. This work is underway; and
- we are continuing to correspond with locally elected politicians about this work and have talked through our plans to engage with the people in Blaenllechau to share our findings.

Ynyshir:

- As part of the storms recovery group set up by RCT, we have been tasked with removing the build-up of material alongside river bridges and structures. Work to take away the blockage on the bridge at Ynyshir will begin shortly.

Tylorstown:

- As part of the storms recovery group set up by RCT, we have been tasked with removing the build-up of material alongside river bridges and structures. Work to take away the blockage on the bridge at Tylorstown will begin shortly.

Mountain Ash:

- Some residents have raised concerns over flood damage in response to properties being flooded when the grid was overwhelmed on the Welsh Government Woodland Estate at Darren Las;
- NRW attended a public meeting with local councillor and leader of RCT, Andrew Morgan, on 11 March to speak with people whose properties were flooded;
- We continue to look into the land management practices, culvert maintenance and ground conditions of the land and forestry. The outcome of this work will be shared with officers from Rhondda Cynon Taf (RCT) Flood Investigation Report as well as with the community;
- We are working alongside officers from RCT to design and construct a new grid on the culvert. We hope for work on site to start in November; and
- Regular inspections are being carried out on the grid to ensure there are no blockages and the stream can flow freely. The frequency of these inspections will increase when there is a heavy rainfall alert.

Summary of extent to which you have returned to Business as Usual:

- The team has adapted work programmes to participate in the review work, deal with queries from the communities affected, respond to correspondence, as well as participate in the recovery workstream.
- 'Business as usual' is likely to be several months away.

Outstanding Issues:

- Share our findings with the communities affected by flooding at Pentre, Mountain Ash and Blaenllechau.

South West – Land Management Team South West Wales

Summary of key Communities affected in West Wales

Those communities affected by flooding from main river (especially during Storm Dennis) in South West were:

- Aberdulais (Neath Port Talbot);
- Crynant (Neath Port Talbot);
- Carmarthen Town (Industrial properties); and
- Britton Ferry (surface Water from WGWE).

There was also a small number of isolated properties across the South West that were affected, especially in the large flood plains, such as the Teifi and Tywi valley. At the outset of Storm Dennis, these were not expected to flood according to early Flood Forecasts.

Local actions you took in those communities

Local actions undertaken in areas affected by main river flooding included:

- Staff from the Integrated Workforce undertook both pre and post inspections of our grid systems and noted any issues that required further engineering support via the Integrated engineering team;
- we have implemented repairs to damaged flood assets using our Integrated Workforce;
- the Integrated Engineering Team has undertaken formal T98 asset inspections to ensure that our flood defences remain fit for purpose. They have recorded any damage to ensure they get included in the maintenance and capital programmes;
- NRW attended site visits and meetings with the Chief Executive of Neath Port Talbot in relation to flooding at Aberdulais, and with the Chief Executive of Carmarthenshire LA, relating to flooding in part of the industrial area of Carmarthen town. Staff have also met and spoken to many residents and heard their concerns;
- we responded to correspondence with Councillors, Senedd Members and MPs in relation to flooding matters raised by their constituents; this is still ongoing today; and
- local actions undertaken at locations affected by water courses on the WGWE.

Prior to Storm Dennis, the DTM established a rota of Land Management staff available to deal with any flooding issues that occurred on the WGWE. This proved extremely valuable once the extent of flooding and damage became apparent on Sunday 16 February. Issues dealt with in the immediate aftermath included:

- Clearance of blocked culverts in the WGWE, including those that were involved in the flooding of the highway leading to the Resolven office;
- dealing with neighbours whose properties were being affected by run off from the WGWE in a timely manner;
- arranging the clearance of trees impacting on access to properties;
- working with the Coal Authority in relation to the inspection of three major Landslips in the upper Rhondda, implementing actions from those reports; and
- contracting a specialist surveyor to assess critical assets (those that could directly impact on the flooding of property) on the WGWE in conjunction with South Central and South East.

Issues you faced in those communities

Several key themes have arisen following the flooding:

Cause of Flooding & Damage to Assets

Staff have spent time speaking and corresponding with residents affected by the flooding with the focus being often on perceived damage to NRW Flood Assets and the impact of the record rainfall experienced. Residents living in Aberdulais have expressed concerns, given that they were affected during both storm Callum and Storm Dennis. In their view, no perceived action has been forthcoming from public bodies.

Timing of Flood Warnings

We have dealt with several queries relating to the trigger levels for flood warnings and their timings. This was especially the case across Carmarthenshire as the river levels during storm Dennis were in excess of those predicted. As a result, we have had correspondence with business owners in Carmarthen town and the local authority around this matter. The issue is complex in that a small section of wall at Pensarn industrial estate is lower than the remainder of the flood wall and thus properties immediately adjacent to that wall become flooded sooner in the event of overtopping. Surface water flooding also exacerbates the extent of flooding during a large storm event. Taking account of the river level data during storm Callum and storm Dennis, in June a new Flood Warning trigger level was introduced for these businesses, meaning that they would have greater time to prepare for major flood events. Other businesses located behind the higher section of flood defence have retained their original flood warning trigger level.

In terms of Aberdulais, when Resolven gauging station reaches Severe Flood Warning trigger levels, we only have around 40 minutes to instigate the Multi Agency flood protocol to evacuate properties at Canalside Terrace, Aberdulais. The Multi Agency Protocol is being reviewed by the Local Authority following the learning from storm Dennis.

Public Concern following flooding

We have spoken to many residents and their representatives in relation to the frequency of flooding events. We have explained the extreme nature of the event and that our initial priority is around warning and informing, as well as maintaining our assets. We have also explained to business owners that Welsh Government priorities are around the protection of domestic properties rather than industrial ones.

Things you have successfully addressed

- Working with the South Wales warning and informing team, we have met with Carmarthenshire LA to explain how Flood Warning Triggers on the Tywi in Carmarthen are implemented. A new Flood Warning area (Pensarn) has also been created and implemented as of June;
- we have undertaken emergency work as recommended by the Coal Authority on those critical land slips on our Estate;
- we are working with the Local Authorities across the south west to establish which assets are in the ownership of NRW and which are not. One complex case has been in Ystradgynalis where the parapets of a footbridge failed immediately adjacent to a NRW flood asset;
- we have undertaken all priority (Neath and Tawe catchments) flood asset inspections since the February storm to ensure that they remain fit for purpose in the event of another flood;
- following initial meetings with the Chief Executive of Neath Port Talbot Council and residents at Aberdulais, we agreed to review whether anything further could be done to prevent future flooding. Arrangements are in place (delayed by COVID-19) to meet NPT Council and CADW to discuss this. In preparation, NRW will undertake additional flood modelling at the site, using Storm Callum, Storm Dennis and other

- data. This will allow us to sensitivity test the impacts of the aqueduct on the flood flows to determine if there is any benefit in removing or altering the listed aqueduct;
- supported by the Integrated Engineering team, our Direct Delivery Workforce has undertaken emergency repairs on our damaged assets (where possible during the COVID-19 lockdown);
 - during the past – four to six weeks we have also restarted work on our annual maintenance program as COVID-19 restrictions lift and staff feel safe to undertake the work; and
 - we have responded to numerous emails and letters following the February storms although there can at times be confusion as to which department is best placed to respond to these (Ops Manager Land & Assets or Ops Manager Flood).

Outstanding issues

- We have made several commitments to meet with the communities that were impacted by flooding during the February storms. These are namely householders in Aberdulais and the business community in Carmarthen town. These meetings have been put on hold due to COVID-19;
- while the Coal Authority has undertaken inspections of our major Landslips on the WGWE (that led to the undertaking of emergency safety works), we require exploratory funding (estimated to be around £50K) to engage Projects Delivery to assess the scale of further works that may be required on these slips/tips;
- we have focused the work of T98 inspections in the Tawe and Neath catchments, following the February storm events, and will work to enhance resources to complete our programme of inspections for the south west;
- while all high-risk assets have been inspected, we need to develop a program of Asset Inspections for our WGWE and NNR assets to ensure they are inspected in accordance with a set methodology (the same as that done for flood assets); and
- Storm Jorge caused damage to a flap valve on the river Ritec outfall in Tenby. This has resulted in us having to manually close a valve to prevent flooding to properties during high tide events. A replacement outfall valve is on order from Sweden, however, due to COVID, we have been experiencing delays and this may not be repaired until August. Our Ops workforce is required to attend site to operate a manual valve at each tide which is time consuming and would jeopardise our response during a fluvial flood event.

Summary of extent to which you have returned to Business as Usual

- Responding to the February floods is now a 'day job' activity. It has brought additional pressure at a time when the integrated engineering team has been at 50% capacity due to post OD vacancies. It is also worth noting that the impact of Storm Callum on West Wales in 2018 was significant and we are still dealing with outstanding commitments from that event in addition to the issues that arose during this February storms. COVID restrictions have also impacted on our ability to undertake some elements of work.

Mid Wales

a. North – FR&WM Severn, Vyrnwy, Teme

Flood Recovery Report Contribution

Summary of key communities affected in Upper Severn

Summary of key communities affected in Severn, Vyrnwy and Teme catchments:

- Knighton;
- Properties around Confluence of Vyrnwy and Severn around Llandrino; and
- Small groups properties around Welshpool IDD incl. The Wern, Tre'wern Brook.

Knighton is the main location affected as a result of Storm Dennis. Other locations throughout the Severn, Vyrnwy and Teme experienced widespread flooding of agricultural land, with many isolated properties experiencing access/egress difficulties. A smaller number of properties experienced internal flooding during these storms.

Local actions you took in those communities

Local actions undertaken at all locations affected by main river flooding include:

- Joint site visits have taken place in Knighton with representatives from Powys County Council to speak with residents affected, collate flooding extents, flow paths, properties flooded and understand the source of flooding;
- a Flood Investigation Report is being compiled for Knighton;
- post flood asset inspections have taken place on key flood risk assets;
- damage assessment to hydrometric assets has been carried out;
- we have carried out hydrological analysis of the event to understand the scale of the events throughout February;
- we have been responding to emails and letters from residents and local elected members following the flooding; and
- we have begun discussions with Powys County Council and the community on the formation of a Flood Partnership Group.

Things you have successfully addressed

- Emergency debris and tree works when there is a risk it could cause flooding to property;
- emergency repairs have been identified and programmed;
- we have provided expert advice throughout the area to those needing to carry out repairs in river work, through the permit and consent process; and
- we have been responding to emails and letters following the February storms, working with legal and communication teams to provide accurate responses to individuals, Welsh Government and media outlets.

Outstanding issues

- We have included a flood risk study for Knighton within our 2020/21 work plan to see if anything can be done to reduce the risk of flooding in future;
- repairs to hydrometric assets to be completed; and
- continue work to address defects to some assets in some areas

Summary of extent to which you have returned to Business as Usual

Responding to and addressing flood risk is business as usual for the FRM teams. The flooding has meant reprioritisation of the work we were doing. COVID-19 has had a significant impact on the way we are delivering the business.

b. FRM and WR Mid Wales (South)

Summary of key communities affected in Mid Wales (South)

Key communities affected by flooding from main river in Mid Wales (South):

- Crickhowell Town Centre;
- Elvicta Business Park (d/s of Crickhowell);
- Llanwenarth;
- Glasbury;
- Builth Wells/Llanelwedd; and
- Penybont.

These are the main locations. Other isolated locations were flooded but lower numbers of properties were impacted.

Local Actions you took in those communities

Local actions undertaken at all locations affected by main river flooding include:

- Staff have been visiting all locations impacted to check on and speak to residents, provide advice and gather information and data regarding the sources and onset of flooding as well as the impacts (e.g. numbers of properties flooded, depths of flooding);
- we have brought in consultants to support the gathering and recording of the flood event and impact data to ensure we capture all evidence while it is still available;
- immediate informal inspections were carried out on the rivers and defences in the areas impacted by flooding in order to record the condition of flood risk assets and check on river channels for blockages or damage. Information was fed through to the local Integrated Engineering and Workforce Teams so that our assets could be repaired to remain fit for purpose. Some of the repairs have/will be temporary initially;
- Asset Performance staff have supported the Integrated Engineering Team to undertake formal T98 asset inspections to ensure that our flood defences remain fit for purpose. Any damage and necessary repairs are recorded so that they are included in maintenance and capital programmes;
- attended site visits at Crickhowell;

- responded to much correspondence with Councillors, SMs and MPs to address local matters; and
- attended community flood meetings with residents in some areas.

Issues you faced in those communities

As would be expected, two main themes have recurred during the period following the flooding:

“Why did we flood?”

Staff have spent a lot of time speaking and corresponding with residents affected by the flooding to explain that the cause of the flooding was the exceptional rainfall. In Crickhowell, there is a local perception that there was a surge of water in the early hours of the morning that caused the flooding, with some suggestions that there was a reservoir release. We have checked the river gauges and can find no evidence of any such ‘surge’. The river level hydrograph looks typical for this reach on the River Usk (though higher than normal). We believe a ‘surge’ may have been created as the water reached the soffit of the main Town Bridge over the River Usk. This would have had the effect of rapidly rising backwater once the conveyance through the bridge was limited. Staff have spent time explaining to a lot of people that the flooding was purely due to the rainfall and have used actual and historic data to explain how the rainfall was of record levels. Very often, they have not been believed.

“What will be done to stop it happening again?”

This question has expectedly come up again and again. We have spoken to many residents, SMs, Councillors etc who all are asking the same question. We have advised on the extreme nature of the event and explained that our initial priority is to get the flood defences and river channels back to pre-flood status. Once this is complete, we will then start to look at what can be done to reduce the risk. We have explained that many of the areas affected already benefit from sizeable flood defences and that any local decisions will need to consider the impacts they will have on upstream or downstream communities, as well as the feasibility and acceptability to the community at risk.

Things you have successfully addressed

- We have made immediate changes to the flood warning process with the aim of reducing the likelihood of late flood warnings being issued in a similar significant event;
- we have spoken with residents in most communities impacted by the flooding;
- we are working with the Local Authorities and other agencies such as Dŵr Cymru to share information on flooding and impacts, using this information to inform our flood review;
- to ensure all evidence is captured while it is available, the use of consultants to support the gathering and recording of the flood event and impact data has been significantly important. Much of the data would have been lost without this approach;

- we have supported the inspection of all NRW flood defence assets since the storm events in February to ensure that they remain fit for purpose in the event of another flood. We have identified and recorded any damage, working with the Integrated Engineering and Workforce Teams to facilitate repairs;
- our Development and Flood Risk Team has been ensuring that we enable as many emergency repairs as possible on our rivers by others (private/public authority). This has been made possible through the provision of timely expert advice and where appropriate, FRAPs, while ensuring no detriment to the environment because of such work; and
- the whole department has been involved in responding to the plethora of emails and letters following the February storms.

Outstanding issues

- Several public meetings were requested following the flooding. The subsequent COVID19 working arrangements/policy has prevented many of these happening. Further community engagement will be necessary once government and health advice allow.
- There is significant outstanding policy matter regarding improvements to flood defences, which already provide the normal indicative standard of protection against a 1% (1 in 100) annual event. Dialogue between Welsh Government and NRW Policy Team is required.

Summary of extent to which you have returned to Business as Usual

Responding to and addressing flood risk is business as usual for the FRM teams. The flooding has meant reprioritisation of the work we were doing. COVID-19 has had a significant impact on the way we are delivering the business.

North West Wales

Summary of key communities affected in North West Wales

The principle community affected by flooding from main river was:

- Llanfair Talhaiarn.

Other communities flooded from non-main rivers include:

- Llanrwst;
- Betws y Coed;
- Colwyn Bay;
- Llangernyw;

- Trefriw;
- Eglwysbach;
- Llansannan; and
- Maenan.

These are the main locations. Other locations across North West Wales were flooded, but lower numbers of properties were impacted.

Local actions you took in those communities

Local actions undertaken at all locations affected by main river flooding include:

- Arrangements were put in place to perform asset inspections to identify any failing assets. These inspections, as well as reports from members of the public, formed the basis of emergency works in key locations including Llanfair TH and Llanrwst;
- Operations shift rotas were put in place until Hydrometry & Telemetry teams could replace sensors and telemetry following the damage of the instrumentation during the event;
- Integrated Engineering and Workforce teams have carried out recovery work including the removal of 70 tonnes of inorganic material and five tonnes of organic material from the upstream side of the tree catcher, as well as three tonnes of organic material from on and around the debris screen alongside the chapel house;
- attended a site meeting with First Minister and Ken Skates MS at Llanfair TH, speaking with members of the community and local councillors;
- Flood risk operations teams have been visiting all locations impacted to check on and speak to residents, provide advice and gather information and data regarding the sources and onset of flooding as well as the impacts (e.g. numbers of properties flooded, depths of flooding);
- we have carried out hydrological analysis of the event to understand the scale of the events throughout February;
- in lieu of a public drop in that was planned for the end of March, we have compiled and circulated a list of frequently asked questions to all residents in the village inviting them to raise questions with us through email or postal correspondence;
- we have been responding to emails and letters from residents and local elected members following the flooding;
- jointly with Conwy County Borough Council, we have met via Zoom with the local MS Darren Millar, to provide an update on what we are doing following the storms;
- Conwy CBC have brought in consultants ARUP to carry out a S19 investigation and we are providing both written and verbal information to support their report. A draft report is due for completion at the end of June 2020; and
- we are holding a virtual meeting with the local community council on Monday 15 June 2020 to update them and work with them to set up a local flood partnership group.

Borth Leri Embankment

- The Embankments are within Dyfi SSSI and the Cors Fochno SAC and protect farmland, the designated site and a small number of properties;

- an emergency repair was agreed upon and completed before the high spring tides starting on 7 April which would have potentially threatened further damage to the embankment and flooding of property nearby if they had overtopped. Temporary boarding was put in place to protect the breach reinstating the crest height and protection level provided by the embankment; and
- further work to move the material lost from the embankment to the nearby Pwll Du was carried out and the boarding has been re-enforced. Further boarding has been installed in other areas along the embankment to improve the crest height in low spots. Since the dry weather there has been some shrinkage and cracking of the material that has been reinstated, some further work may be required here and also consideration given to what the permanent fix and wider strategy is for the area and embankment.

Emergency repairs to Cefni Embankment Anglesey following storms.

- Following the March storms and prolonged wet weather a large horizontal crack appeared in the outward face of the embankment. There is no berm and the bank edge had become unstable offering no support to the slope causing it to shear and slip. The embankment protects a small number of properties in the area; and
- temporary repair works have been completed installing pipes into the ditch for the length of the crack and re-instate the bank using locally sourced material. This will afford some stability to the bank. Further scouring has recently been identified downstream and so repairs are currently being discussed as part of our work programme of essential works under current COVID 19 restrictions. An assent will be needed from the Environment team as the work is within a SSSI.

Tan Lan Embankment

- The breach in the Tan Lan embankment remains unrepaired whilst the strategy and long-term plan for this are confirmed.

Issues you faced in those communities

- Many in the community believe that the cause of the flooding was blockage of the culvert screen rather than the scale of the event. We are working hard to explain that based on the evidence blockage was not the cause. Rebuilding trust with the community will be key for us going forward which we hope to help address through establishing a local flood partnership group;
- with the completion of some capital works within the village last year, there is a view that this meant that flooding would never happen again. This was not the case and nor was this message communicated to the community. We have explained this as part of our FAQs to the community. We hope that continued discussions, combined with establishing the flood partnership group, will help explain more clearly the issue of flood risk in the community; and
- there was much confusion over the flood warning system in place at the time. This provided direct warnings to volunteer flood wardens who would then instigate the community flood plan and warn residents at risk. This confusion was again addressed within the FAQs circulated to residents and we will look to make improvements going forward.

Things you have successfully addressed

- We have been making improvements to the dissemination of our Operational Message by including it on our Flood Warning System. This means that all residents at risk can register to receive notification of the alarm. This service will be operational by end of May 2020;
- this service is not an official Flood Warning Service but an 'Early Warning service based on our operational level triggers at the Water Street culvert. It is not a flood warning service as would be seen by other communities. The service is being offered to all those within the flood risk area and also those beyond who have an interest, or park vehicles in the flood risk area. It will provide notification to all those registered on our system of potential flooding to properties if conditions on the Nant Barrog grid deteriorate (*similarly to what was experienced during the 9th February 2020 event*);
- we have spoken to affected residents and developed the FAQ document to help the community understand what happened and what we will be doing next;
- we are working with Conwy CBC to support the completion of the S19 report;
- we have used consultants AECOM to carry out further analysis to provide us with an indication of the scale of the event within Llanfair Talhairn on the 9 February;
- we have provided expert advice throughout the area to those needing to carry out repairs, in river work through the permit and consent process; and
- we have been responding to emails and letters following the February storms, working with legal and communication teams to provide accurate responses to individuals and media outlets.

Outstanding issues

- Delivery and 'Go Live' of the improved flood warning service and work with Flood Warden Group to update their Community Flood Plan. This service is expected to be operational by mid August 2020;
- undertake a CCTV Survey of culvert beneath Water Street and structural inspection of the nant Barrog weir;
- clearance of Gravel trap and repairs to tree catcher which has been delayed as a result of COVID-19 restrictions; and
- project team to review options involving the Elwy defences, Barrog debris screen, Property Level Resilience (PLR) measures and Natural Flood Management.

Summary of extent to which you have returned to Business as Usual

- Responding to and addressing flood risk is business as usual for the FRM teams. The flooding has meant reprioritisation of the work we were doing. COVID-19 has had a significant impact on the way we are delivering the business
- A post flood action plan has been developed with Short (Feb – Oct 2020), Medium (autumn 2020 – winter 2021) and long-term actions (Jan 2022 – Dec 2025).

North East Wales

Summary of key Communities affected in North East Wales

Key communities affected by flooding from main river were

- St Asaph
- Brookhouse
- Llandrillo

These are the main locations, though other locations across North East Wales were flooded, but lower numbers of properties were impacted. Other locations did not experience flooding of property but subsequent repairs to defences were needed.

Local Actions you took in those communities

Local actions undertaken at all locations affected by main river flooding include:

- arrangements were put in place to perform asset inspections to identify any failing assets. These inspections, as well as reports from members of the public, formed the basis of emergency works in key locations St Asaph, Ruthin and Bangor on Dee;
- shift rotas were in place to inspect defences in the Lower Dee and man pumps at Almere and Plas Devon;
- site meeting attended with Lesley Griffith MS, Wrexham council at Bangor on Dee racecourse;
- damage to Hydrometric assets key to the operation of the flood warning service have been repaired in St Asaph;
- Flood risk operations teams have been visiting locations impacted to check on and speak to residents, provide advice and gather information and data regarding the sources and onset of flooding as well as the impacts (e.g. numbers of properties flooded, depths of flooding). This will feed into Flood Investigation Reports;
- we have carried out hydrological analysis of the event to understand the scale of the events throughout February;
- a public event which was set to be held by St Asaph with local MP, Dr James Davies, has had to be postponed as a result of COVID-19;
- we have been responding to emails and letters from residents and local elected members following the flooding;
- we have commissioned JBA to complete a post flood survey of the defences within St Asaph. They will review the performance of the scheme and investigate the locations where flooding was experienced so we can understand more about the issues in these areas and
- contributed to internal and multi-agency debrief on Storm Ciara.

Issues you faced in those communities

- Following the recent completion of the capital scheme in St Asaph, on the whole the scheme worked very well, protecting 360 properties. However, we are managing

correspondence in relation to some areas where flooding was experienced. This is being investigated and the outcome will be shared with the community.

Things you have successfully addressed

- Emergency debris and tree works when there is a risk it could cause flooding to property
- we have provided expert advice throughout the area to those needing to carry out repairs in river work through the permit and consent process; and
- we have been responding to emails and letters following the February storms, working with legal and communication teams to provide accurate responses to individuals, Welsh Government and media outlets.

Outstanding issues

- St Asaph community council disbanded the Flood Partnership Group following the completion of the improvement scheme in 2019. The Mayor of St Asaph is looking to establish a working group in response to the flooding experienced. NRW expects to be invited onto this group;
- action any recommendations that may follow the St Asaph scheme review;
- work with Projects Delivery to carry out short term and long-term improvement works to defences in Bangor on Dee; and
- instigate some minor repairs to flood risk assets.

Summary of extent to which you have returned to Business as Usual

- Responding to and addressing flood risk is business as usual for the FRM teams. The flooding has meant reprioritisation of the work we were doing. COVID-19 has had a significant impact on the way we are delivering the business.

Appendices

Appendix 1 – Recovery action plan recommendations – First draft July 2020

Action Ref	Action	By Whom	By When	Status / Progress	Priority Rating
Damage Assessment – Flood					
1	<i>Supported by consultants where required, complete post event survey work (extents and flood mechanisms).</i>	<i>Asset Performance Teams and flood risk analysis/ FIM</i>	<i>31/08/2021</i>	<i>Recovery South Ongoing - Report being developed. North - complete</i>	<i>High</i>
2	<i>Utilise this flood extent and mechanisms information as appropriate for future flood schemes/ strategy.</i>	<i>Asset Performance Teams and flood risk analysis/ FIM</i>	<i>Short, medium and long term</i>	<i>BAU</i>	<i>High</i>
Repairs – Flood					
3	<i>Continued development of recommended actions for each defect and likely costs and dates.</i>	<i>Place-based teams</i>	<i>Short term</i>	<i>Recovery</i>	<i>High</i>
4	<i>Address all defects (emergency repairs; straight forward fixes and complex capital schemes), including some which have received temporary repairs initially. Achieve this through a range of interventions, from short term running repairs to complete asset replacement.</i>	<i>Place-based teams</i>	<i>Short, medium and long term</i>	<i>Emergency Repairs completed, hence BAU</i>	<i>High</i>
Damage Assessment Land					
5	<i>Development of an Asset inspection and maintenance programme for the WGWE akin to the approach taken in</i>	<i>Land Stewardship BB</i>	<i>Medium – Long term?</i>	<i>Beyond recovery</i>	<i>High</i>

	<i>Flood - Preparation of a master bridges record, and physical inspection of civil engineering structures</i>				
<i>Repairs – Land</i>					
6	<i>Outline an approach for delivery, resolve resource and budget for repairs on the WGWE and ensure appropriate Governance arrangements are put in place.</i>	<i>Land Stewardship BB</i>	<i>Short - term</i>	<i>This work needs to be coordinated beyond recovery due to the size, scale and governance arrangements required over and above place. Working with Projects Delivery on an approach for delivery.</i>	<i>High</i>
<i>Coal Tips & Wider Landslip Risks</i>					
7	<i>Work with Coal Authority (CA)/WG and other partners to improve knowledge of the location of all high-risk sites coal tip sites in Wales.</i>	<i>Geoscience</i>	<i>Autumn 2020</i>	<i>Progressing</i>	<i>Low</i>
8	<i>Work with CA/WG and other partners to develop a consistent approach to their assessment.</i>	<i>Geoscience</i>	<i>Autumn 2020</i>	<i>Progressing in line with WG's priority for this work</i>	<i>High</i>
9	<i>Influence WG & CA to include all industrial legacy sites in their risk assessment (to include not just colliery but also other sites such as opencast, quarry, and metal and other mines).</i>	<i>Geoscience</i>	<i>Medium term</i>	<i>WG focussed on colliery sites. Recognition now that work needs to expand to include other sites.</i>	<i>Med</i>
10	<i>Work across NRW to ensure our risk assessment, remediation and maintenance work, environmental harm mitigation and event reaction on assets within the WGWE meet the agreed standard set from the planned review. This</i>	<i>IMBB; Land Stewardship BB; EPP NRM & LSD & FCRM depts..</i>	<i>Autumn 2020</i>	<i>Work commenced</i>	<i>Med</i>

	<i>should include work to integrate NRW Estate incidents into the incident management system</i>				
11	<i>Work across NRW to ensure the support we provide to other authorities is to an agreed level where our assets may impact their land, or where we are best placed to support work not related to the WGWE (e.g. risk assessment, environmental harm mitigation, event reactions, and remediation and maintenance work.)</i>	<i>EPP NRM & LSD & FCRM depts.</i>	<i>Autumn 2020</i>	<i>Work commenced and ongoing.</i>	<i>Med</i>
12	<i>Work across NRW to ensure we undertake and deliver appropriate activity to deal with legacy metal mine assets that we are legally obliged to tackle.</i>	<i>Geoscience</i>	<i>First tranche of high-risk sites March 2021</i>	<i>Progressing well on a risk assessment basis - as identified in the Metal Mines Strategy (i.e. top 50 high risk sites from the 1310 Wales metal mine sites)</i>	<i>High</i>
13	<i>Assess low-risk sites and the scale of further works that may be required on coal slips/tips on the WGWE</i>	<i>Integrated Land & Asset Managers and Projects delivery</i>	<i>Short term</i>	<i>Recovery</i>	<i>Med</i>
14	<i>Plan and schedule any required other maintenance or actions and deliver in line with this</i>	<i>Integrated Land & Asset Managers and Projects delivery</i>	<i>Medium term</i>		<i>Med</i>
<i>Information</i>					
15	<i>Continue to maintain and update the correspondence tracker and Flood Information Pack.</i>	<i>Lead Specialist Advisor, Strategic Planning and Investment</i>	<i>Short, medium and long term</i>	<i>Ongoing</i>	<i>High</i>
<i>Environmental Effects</i>					
16	<i>Complete work to understand the effects on the environment.</i>	<i>Various specialists from across NRW</i>	<i>End of 2020</i>	<i>Ongoing</i>	<i>Med</i>

	<i>Recovery of Staff</i>				
17	<i>Boost the resilience of rotas including through action to bolster staff numbers through a 'call for volunteers', and by working on the allowances review, which is now being implemented following consultation with staff.</i>	<i>Head of Flood Incident Risk Management and Manager, Incident Management ; ODPM</i>	<i>Sept 2020</i>	<i>Ongoing</i>	<i>High</i>
	<i>Tools & Equipment</i>				
18	<i>Work package 1: Having clear continency plans and business continuity processes that prioritise key services.</i>	<i>Recovery Manager; Workstream Lead; Manager, National Flood Risk Services; Ops; ICT & Comms</i>	<i>Short term</i>	<i>In progress</i>	<i>High</i>
19	<i>Work package 2: Our website is more resilient and able to cope with increased traffic during an incident.</i>	<i>Workstream Lead; Contractor - ICT Development & Innovation Programme</i>	<i>Short term</i>	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>
20	<i>Work package 3: Our Incident rooms are suitably equipped.</i>	<i>Workstream Lead and Team Leaders for Deskside Support (ICT); Facilities South and North</i>	<i>Short term</i>	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>
21	<i>Work package 4: Mobile phones are sufficiently robust for extreme weather and staff know how to use them.</i>	<i>Workstream Lead; Team Leader, End User Device Management (ICT); Specialist Advisor, Business Services (ICT)</i>	<i>Short term and medium term</i>	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>

22	<i>Work package 5: Risks around network coverage of mobile phones are mitigated.</i>	Workstream Lead; Team Leader, End User Device Management (ICT);	<i>Short term and medium term</i>	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>
23	<i>Work package 6: Plant and fleet, and their logistical management, support our response to storm events:</i>	Workstream Lead; Team Leader, Facilities & Fleet Technical Assets	<i>Short, medium and long term</i>	<i>In progress- Enhancements beyond Recovery</i>	<i>High</i>
<i>External Relations; Community Reviews/ Place (and issues arising)</i>					
24	<i>Continue to work collaboratively on development of LA s19 flood investigations.</i>	<i>Flood Ops Managers (Flood & Asset Managers)</i>	<i>Short term</i>	<i>Recovery - Ongoing</i>	
25	<i>Community engagement/ communications as needed in some communities that experienced flooding from the storms in February 2020.</i>	<i>Flood Ops Managers and Communications</i>	<i>Short term</i>	<i>BAU</i>	
26	<i>Clarify WG Policy on 'adoption' of 'orphan' assets on main rivers.</i>	<i>Head of Business</i>	<i>Medium term</i>	<i>BAU</i>	
27	<i>Clarify WG policy regarding improvements to flood defences which already provide the normal indicative standard of protection against a 1% (1 in 100) annual event.</i>	<i>Head of Business</i>	<i>Short term</i>	<i>BAU</i>	
28	<i>Repairs to hydrometric assets to be completed.</i>	<i>Ops Managers</i>	<i>Short term</i>	<i>Recovery</i>	<i>High</i>

Appendix 2 – Recovery Metrics and Progress

Work Package	Metrics	Owner
Damage Assessment Flood Objective: We have a clear understanding of the damage to our assets - flood risk defences and structures,	Percentage of assets assessed across Wales.	Manager, National Flood Risk Services
Damage Assessment Land Objective: – We have a clear understanding of the damage to our assets – land assets.	Number and percentage of high-risk assets on WGWE assessed by end June.	Operations Manager Land & Assets – South Wales Central
Repairs Assessment Flood Objective: We need to address what needs doing in the immediate and longer term – flood.	Emergency Repairs completed.	Lead Specialist Advisor, Strategic Planning and Investment
	Percentage of defects assigned recommended actions.	Lead Specialist Advisor, Strategic Planning and Investment
	Percentage of the identified repairs which now have forecast costs.	Lead Specialist Advisor, Strategic Planning and Investment
	Percentage of the identified repairs, which have programmed start dates or are deemed low priority and will be programmed for future years.	Lead Specialist Advisor, Strategic Planning and Investment

Repairs Land - Objective: We need to address what needs doing in the immediate and longer term.	Number of emergency repairs on WGWE completed	Operations Manager Land & Assets – South Wales Central
	Number and percentage of defects assigned recommended actions by mid-July.	Operations Manager Land & Assets – South Wales Central
	Number and percentage of the identified repairs which have forecast costs by end July.	Operations Manager Land & Assets – South Wales Central
	Number and percentage of the identified repairs, which have programmed start dates or are deemed low priority and will be programmed for future years by mid-August.	Operations Manager Land & Assets – South Wales Central
Recovery of Staff Objective: we support the recovery of staff involved in, or affected by, the incident,	Percentage of staff, involved that have been involved or affected by the flooding, who were offered drop in sessions.	ODPM
	Percentage of staff that have been involved or affected by the flooding, who were offered trauma awareness sessions.	ODPM
Information/ correspondence Objective: We reply to all 2020 flood event correspondence with professional, accurate, consistent and timely responses.	Correspondence and requests for information have received a holding response.	Senior Specialist Advisor, Continuous Improvement/ Lead Specialist Advisor, Strategic Planning and Investment
	Correspondence and requests for information have received a substantive response	Senior Specialist Advisor, Continuous Improvement/ Lead Specialist Advisor, Strategic Planning and Investment
External relations	Contributed to s19s upon request so that they are developed collaboratively.	Flood Ops Managers

<p>Objective: We have oversight of, and support, NRW's work with partners, including Local Authorities and communities, ensuring that we have captured issues arising for NRW and have plans to address these.</p>		
<p>Community reviews including Pentre –</p> <p>Objective: We have oversight of, and support, NRW's work with our partners, including Local Authorities and communities, ensuring that we have captured issues arising for NRW and have plans to address these.</p>	<p>Percentage completion of Pentre Review.</p>	<p>Operations Manager Land & Assets – South Wales Central</p>
<p>Coal Tips & Wider Landslip Risks –</p> <p>Objective: We understand the impact of the floods for the land that we manage and immediate action is taken to protect communities and the environment.</p>	<p>Emergency remediation completed,</p>	<p>Sustainable Land Manager</p>
<p>Environmental Effects</p> <p>Objective: We understand the impact of the floods on the environment, protected sites and ancient monuments.</p>	<p>We understand the effects of the floods on the environment, protected sites and ancient monuments, including the extent to which Nationally and Internationally important conservation sites and their features have been affected</p>	<p>TBC</p>

Work package 1: Business Continuity Plans Objective: Having clear contingency plans and business continuity processes that prioritise key services.	Percentage of flood services with sufficient contingency actions identified , describing fall back actions to take should systems fail. Including key dependencies identified and addressed (e.g. ICT and comms).	Manager, National Flood Risk Services and Ops Flood & Water Managers, Land & Assets Managers
	Contingency actions have been reflected in procedures (including ICT & Comms).	
Work package 2: Website resilience Objectives Our website is more resilient and able to cope with increased traffic during an incident.	Contingency plan if website fails	BCP owners - Manager, National Flood Risk Services and Ops Flood & Water Managers, Land & Assets Managers
	Percentage progress to delivering a workaround solution identified and in place so that our website is able to cope with increased traffic during an incident	Contractor - ICT Development & Innovation Programme
	Resilient Infrastructure - Improvements to current underpinning infrastructure.	Contractor - ICT Development & Innovation Programme
	Incident Alerting (Refresh) - Refresh of incident alerting and communication approach/	Contractor - ICT Development & Innovation Programme
	Website continual improvement - Long term delivery model for continual website improvements	Contractor - ICT Development & Innovation Programme
	Future Support Model - Introduce a new support model for the website,	Contractor - ICT Development & Innovation Programme
Work package 3: Incident rooms Objective – Our Incident rooms suitably equipped:	Contingency plan if incident room is inaccessible – relocate to another office where there is an incident room or remotely from home.	BCP Owners
	Percentage of compliance with current IM spec (Facilities) across all incident rooms	Team Leaders Facilities South and North

	Percentage of compliance with current IM spec (ICT) across all incident rooms.	Team Leaders Facilities South and North
	Percentage of overall compliance with current IM spec, across all incident rooms.	Team Leaders Facilities South and North

Work package 4: Mobile phones Objectives: Mobile phones are sufficiently robust for extreme weather and staff know how to use them,	Contingency - Spare phones in grab bags and incident rooms have direct BT line.	Team Leader, End User Device Management (ICT)
	Percentage of the number of phone users involved in flood incident response, who report an issue with their handset , that have received a work around solution to allow an effective method communication for their incident management role. (e.g. spare phones/ phone cases?)	Team Leader, End User Device Management (ICT)
	Percentage of number of phone users involved in flood incident response, who report an issue with their handset , that have received highly resilient methods of communication for their incident management role and know how to use them. (Long term solution/ replacement handsets)	Team Leader, End User Device Management (ICT)
Work package 5: mobile phone networks Objective: Risks around network coverage of mobile phones are mitigated.	Contingency if signal is unavailable - use of land line/ incident room BT Mitel phones	BCP owners
	Percentage of the number of phone users involved in flood incident response, who report an issue with network signal that have received a work around solution to bolster existing/ provide a new method of communication for their incident management role.	Team Leader, End User Device Management (ICT)
	Percentage of the number of phone users involved in flood incident response, who report an issue with network signal that have received a long-term solution for a method of communication for their incident management role. (e.g. new phone contract)	Team Leader, End User Device Management (ICT)

Work package 6: Fleet.	Contingency Plan if fleet not available - informed by prediction of a flood event, hire in 4x4 or other suitable vehicles/plant, in advance, from existing contract	Ops delivery workforce?
Objective: Plant and fleet, and their logistical management, support our response to storm events.	Percentage of gaps in fleet vehicles/ plant identified by Operational staff, which have been enhanced/replaced or otherwise addressed to enhance our ability to deal with an incident.	Team Leader, Facilities & Fleet Technical Assets
Call for new volunteers (first call) (first phase).		<i>Manager, Incident Management</i>
Placement of new volunteers (first phase).		<i>Manager, Incident Management</i>
New trained staff on rota.		<i>Manager, Incident Management</i>
Allowances review.		<i>Manager, Incident Management</i>
Issuing of new rota regime and call for new volunteers (second call).		<i>Manager, Incident Management</i>
Placement of new volunteers (second phase).		<i>Manager, Incident Management</i>
New trained staff on rotas by Autumn.		<i>Manager, Incident Management</i>
Complete voluntary initiatives, assess rota resilience, consider next steps and develop a solution (if required).		<i>Manager, Incident Management</i>

Progress will be assessed and reported to FRMC monthly using the following status measures:

Blue:	Achieved.
Green:	Successful delivery of the activity to time, cost and quality appears highly likely. There are no major outstanding issues that (at this stage) appear to threaten delivery
Amber/Green:	Successful delivery appears probable. However, constant attention will be needed to ensure risks do not materialise into major issues threatening delivery.
Amber:	Successful delivery appears feasible but significant issues already exist, requiring management attention. These appear resolvable at this stage and, if addressed promptly, should not present a cost/schedule overrun.
Amber/Red:.	Successful delivery of the activity is in doubt, with major potential problems or issues apparent in a number of key areas. Urgent action is needed to ensure these are addressed and establish whether resolution is feasible.
Red:	Successful delivery of the activity appears to be unachievable. There are major issues which, at this stage, do not appear to be manageable or resolvable. The activity may need re-baselining and/or overall viability re-assessed.
Black:	Failed / stopped.