Monmouthshire County Council

Flood and Water Management Act 2010

Local Flood Risk Management Strategy 2025

Flood Action Plan

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Contents

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1. Introduction

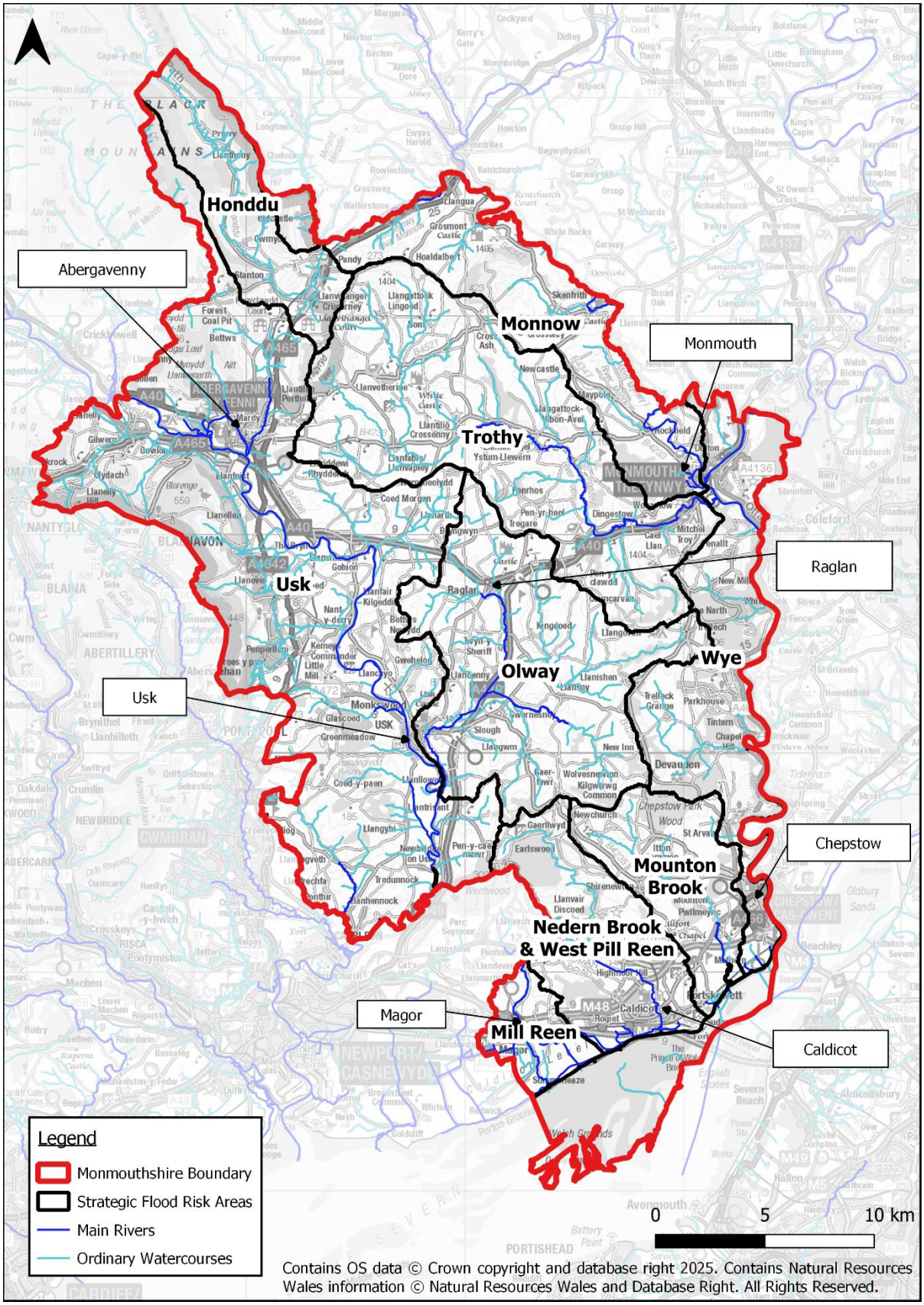
This Flood Action Plan sets out the local flood risk management actions required to meet the objectives and measures identified in MCC's Local Flood Risk Management Strategy. These actions include those that have already commenced, as well as new and future actions identified to help manage the risk of flooding from local sources.

Actions on a county wide scale have been included in the Monmouthshire Flood Action Plan. In addition, individual plans for each of the nine Strategic Flood Risk Areas (SFRAs) have been produced. Each Flood Action Plan includes a local description, history of flooding, details of flood risk and the proposed actions, relevant to that area, that MCC plan to undertake. The list of Flood Action Plans is as follows:

- **Monmouthshire** Flood Action Plan
- **Honddu** SFRA Flood Action Plan
- **Monnow** SFRA Flood Action Plan
- **Trothy** SFRA Flood Action Plan
- **Wye** SFRA Flood Action Plan
- **Olway** SFRA Flood Action Plan
- **Usk** SFRA Flood Action Plan
- **Mounton Brook** SFRA Flood Action Plan
- **Nedern Brook & West Pill Reen** SFRA Flood Action Plan
- **Mill Reen** SFRA Flood Action Plan

Further details relating to the development of the SFRA's in Monmouthshire is included in Chapter 3 of the Local Strategy.

Figure 1. Strategic Flood Risk Areas (SFRAs)



Each action has been categorised on the type of flood management approach using the following headings:

Prevention	Measures to encourage appropriate land use and development policy to manage risk.
Preparedness	Measures that enable communities to be better prepared for flood events in a way that mitigates flood risk.
Protection	Measures designed to mitigate the impact of floods.
Recovery and Review	Measures that support recovery after a flooding event and/or review possible improvements to mitigate future risks.

The delivery of each action is subject to funding and capacity within the Lead Local Flood Authority. Anticipated timescales based on priority and deliverability have been assigned to each action, as has an indicative cost range. These, along with the status, will be applied to each action as described below.

Timescales

Short Term	Planned to be delivered in the short term (years 1 – 3)
Medium Term	Planned to be delivered in the medium term (years 3 – 6)
Long Term	Planned to be delivered in the long term (years 6+)
Recurring/Ongoing	Continuing elements of work that will remain as ongoing activities throughout the lifetime of this Local Strategy

Costs

Existing Resources	No specific additional funding required, covered by existing budgets
Low Cost	Additional cost of £1k- £20k
Medium Cost	Additional cost of £20k - £250k
High Cost	Additional cost of £250k - £1M
Very High Cost	Additional cost of £1M and above

Status

Not Started	Actions which are yet to be commenced
Commenced	Actions that have started
Recurring	Actions that are recurring pieces of work
Complete	Actions which have been completed

The Monmouthshire and SFRA Flood Action Plans will be reviewed and updated every 3 years to reflect the LLFA's continued delivery against the Local Strategy's objectives and measures.

2. Monmouthshire Flood Action Plan

This Flood Action Plan includes actions on a county wide scale covering the whole of Monmouthshire. These actions include those that have already commenced, as well as new and future actions identified to help manage the risk of flooding from local sources.

Table 1. County Wide Actions

Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Mon 1	Investigate and record flooding incidents from all sources appropriately, including producing and publishing Section 19 Flood Reports where appropriate, and use this information to inform future investigations and LLFA consultations.	Monmouthshire	Recovery and Review	14	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 2	Review MCC's flood investigation and reporting procedures and provide appropriate training to staff involved in flood incident investigation and reporting functions.	Monmouthshire	Recovery and Review	14	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 3	Work with communities at risk of flooding from ordinary watercourses, groundwater and surface water runoff, to promote awareness and resilience, including property flood resilience measures.	Monmouthshire	Preparedness, Protection, Recovery and Review	4, 5, 7, 9, 10, 14 & 15	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 4	Maintain a long-term capital pipeline of flood alleviation schemes in areas which have experienced significant incidents or at high risk.	Monmouthshire	Preparedness, Protection	15	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 5	Develop an effective way of ranking priority flood alleviation schemes to ensure funding is directed to areas most at risk.	Monmouthshire	Preparedness, Protection	15	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 6	Cooperate with NRW as the RMA for main river flooding in regard to the development and delivery of flood schemes on main rivers.	Monmouthshire	Preparedness, Protection	10 & 15	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 7	Work with Risk Management Authorities, land managers and the community to identify opportunities to incorporate natural flood management within Monmouthshire.	Monmouthshire	Preparedness, Protection	8 & 10	Short	Existing Resource	Revenue	Recurring/Ongoing

Mon 8	In accordance with Section 21 FWMA, maintain the register of structures or features which, in the opinion of MCC as the LLFA, are likely to have a significant effect on a flood risk in Monmouthshire.	Monmouthshire	Protection	11, 12 & 13	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 9	Review MCC's Culverting Policy to ensure alignment with best practice.	Monmouthshire	Prevention, Protection	1, 12, 16	Medium	Existing Resource	Revenue	Recurring/Ongoing
Mon 10	Improve and maintain MCC's network of CCTV monitoring stations on critical culverts.	Monmouthshire	Preparedness, Protection	12, 15, 18	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 11	Establish responsibility for the management of flood risk from key watercourses, flood assets and drainage infrastructure where ownership is unclear and record on the Highways and Flood Management asset database.	Monmouthshire	Protection, Recovery and Review	11, 12, 13 & 14	Long	Existing Resource	Revenue	Recurring/Ongoing
Mon 12	Identify, map and risk assess all significant ponds and small reservoirs within Monmouthshire, to inform future inspections, maintenance and flood risk management.	Monmouthshire	Protection, Recovery and Review	11, 12, 13 & 14	Long	Existing Resource	Revenue	Recurring/Ongoing
Mon 13	Develop and maintain the pro-active routine Land Drainage Inspection schedule and undertake inspections as required.	Monmouthshire	Protection, Recovery and Review	11, 12 & 14	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 14	Review existing inspection and maintenance practices of MCC highway drainage infrastructure to ensure areas at high flood risk are considered appropriately.	Monmouthshire	Protection, Recovery and Review	11, 12, 13 & 14	Medium	Existing Resource	Revenue	Recurring/Ongoing
Mon 15	Identify priority locations for more intensive ongoing maintenance and condition monitoring activities within the MCC Highways drainage network.	Monmouthshire	Protection, Recovery and Review	11, 12, 13 & 14	Medium	Existing Resource	Revenue	Recurring/Ongoing
Mon 16	Provide efficient responses to flooding incidents and emergency recovery following a flood incident.	Monmouthshire	Recovery and Review	6 & 14	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 17	Provide support to communities looking to establish local flood groups and community flood plans to improve local resilience to flooding, with support from other Risk Management Authorities as required.	Monmouthshire	Preparedness	4, 5, 6 & 7	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 18	In coordination with other Risk Management Authorities and related organisations, develop a programme of community engagement events in areas most at risk from flooding in Monmouthshire, to	Monmouthshire	Preparedness	4, 5, 6, 7 & 10	Short	Existing Resource	Revenue	Recurring/Ongoing

	raise awareness and provide appropriate advice and guidance to residents and businesses alike.							
Mon 19	Review MCC's current sandbagging arrangements and update the current Sandbag Policy, covering how sandbags are procured and deployed by all relevant Council departments.	Monmouthshire	Protection	6	Medium	Existing Resource	Revenue	Recurring/Ongoing
Mon 20	Undertake a review and update the LFRMS Action Plan, including the Actions associated with the nine Strategic Flood Risk Areas, every three years or as required.	Monmouthshire	Prevention, Preparedness, Protection, Recovery and Review	16 & 17	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 21	Maintain and develop MCC's Corporate Flood Response Arrangements plan and procedures.	Monmouthshire	Protection, Recovery and Review	4, 5 & 6	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 22	Review and maintain the Flood Risk Management and Emergency Planning web pages on MCC's website, to ensure information on flood risk is up to date and clearly accessible.	Monmouthshire	Preparedness	4 & 5	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 23	Review and update MCC's flood risk advisory leaflets and information in respect of measures to take before, during and after a flood event and publish on MCC's Flood Risk Management webpages.	Monmouthshire	Preparedness	4	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 24	Review MCC's communication practices during severe weather events and establish a Communication Strategy that will ensure MCC delivers clear, consistent and coordinated communication on flood risk; prior to, during and after such events.	Monmouthshire	Preparedness	4, 5, 6 & 10	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 25	Maintain existing Site Specific Flood Response Arrangements Plans for high risk areas and develop new plans as required.	Monmouthshire	Protection, Recovery and Review	4, 5 & 6	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 26	Undertake an assessment of flood risk to caravan parks across Monmouthshire and liaise with owners to ensure suitable plans are in place.	Monmouthshire	Protection, Recovery and Review	4, 5, 6 & 7	Medium	Existing Resource	Revenue	Recurring/Ongoing
Mon 27	Work with Welsh Government and other Risk Management Authorities to support the implementation of the recommendations of the	Monmouthshire	Prevention, Preparedness & Protection	3	Short	Existing Resource	Revenue	Recurring/Ongoing

	'Sustainable Drainage Systems (SuDS) Schedule 3 Post Implementation Review May 2023'.							
Mon 28	Develop a guidance document for the production of Drainage Statements which will be required for future planning applications subject to the requirement of SAB approval.	Monmouthshire	Prevention	1	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 29	Undertake an annual review of the SAB Pre-Application process to ensure appropriate fees are set and that the service meets the needs of Applicants.	Monmouthshire	Prevention, Preparedness & Protection	3	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 30	Support other MCC departments to introduce opportunities for sustainable drainage systems within their own schemes or maintenance works.	Monmouthshire	Prevention, Protection	1, 3, 10 & 15	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 31	Review MCC's Ordinary Watercourse Consenting procedure and update the 'Application Form Guidance Notes' document to align with best practice.	Monmouthshire	Prevention	1	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 32	Establish an Enforcement Policy encompassing all of MCC's statutory functions and permissive powers under the LDA, including the powers afforded by the Land Drainage Act and Schedule 3 of the FWMA.	Monmouthshire	Prevention	3	Medium	Existing Resource	Revenue	Recurring/Ongoing
Mon 33	Consider formal adoption of the 'Land Drainage (Wales) Byelaws' to provide MCC as Land Drainage Authority additional powers to manage local flood risk.	Monmouthshire	Prevention	1 & 14	Medium	Existing Resource	Revenue	Recurring/Ongoing
Mon 34	Develop mobile digital capability to enable use of digital tablets and mobile phones to record inspections, investigations and maintenance works, which can then be uploaded directly into the Highways and Flood Management asset database.	Monmouthshire	Protection, Recovery and Review	11, 12 & 14	Short	Existing Resource	Revenue	Recurring/Ongoing
Mon 35	Consider the need for a policy for the designation of structures significant to flood risk under Schedule 1 of the FWMA.	Monmouthshire	Protection, Recovery and Review	13	Long	Existing Resource	Revenue	Recurring/Ongoing
Mon 36	Undertake a review of coastal erosion and flood risk and record details of coastal flood assets including standard of protection, crest levels, ownership, maintenance responsibility etc. on the Highways and Flood Management asset database.	Monmouthshire	Protection, Recovery and Review	11, 12 & 14	Medium	Existing Resource	Revenue	Recurring/Ongoing

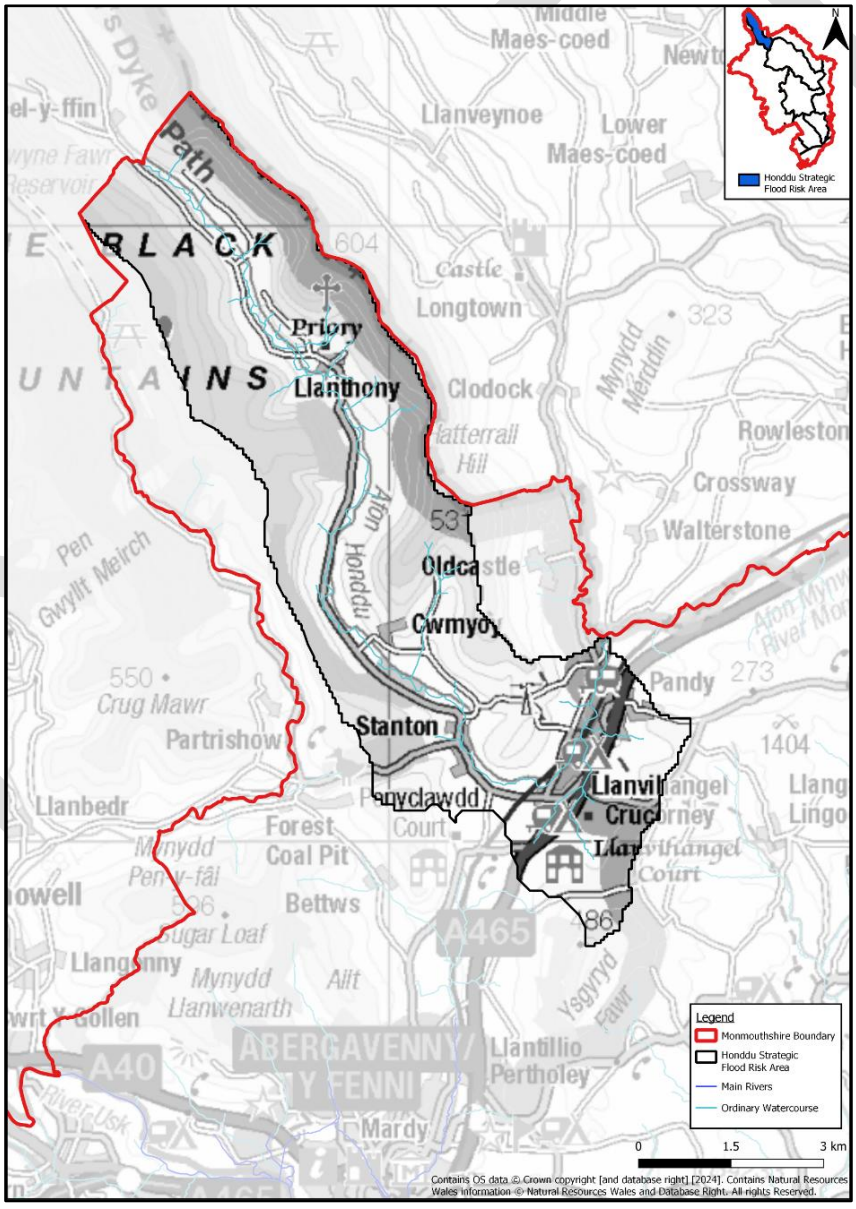
3 Honddu SFRA Flood Action Plan

This Action Plan describes the nature, extent and location of flood risk within the Honddu Strategic Flood Risk Area (SFRA) with an emphasis on local sources of flood risk i.e. surface water, ordinary watercourses and groundwater. It also sets out the actions MCC will undertake, or are already in the process of undertaking, to manage flood risk from local sources.

3.1 Honddu SFRA Description

The Honddu SFRA is located in the northern region of Monmouthshire and borders the Monnow and Trothy SFRAs to the southeast and the Usk SFRA to the west, as shown in Figure 2. This area mirrors the catchment boundary of the Afon Honddu and is one of the smallest in the county covering approximately 44km², including the famed Vale of Ewyas (Llanthony Valley).

Figure 2. Honddu Strategic Flood Risk Area



The main settlements are surrounded by rural pastureland and ancient woodland and include Llanthony in the north, Cwmyoy in the centre and Llanvihangel Crucorney, Wern Gifford and Pandy in the south.

The Afon Honddu flows along the spine of the SFRA and rises from the Black Mountains in the north, following its course through Llanthony and Cwmyoy and on to Llanvihangel Crucorney, before joining the River Monnow just north of Pandy. The most significant tributary is the Nant Bwch, which joins the Honddu outside and to the north of SFRA near Capel-y-ffin in Powys. Other tributaries include the Nant Vision, Nant y Carnau, Nant y Gwyddel and the Cwm Bwchel. There are numerous smaller streams which flow down the steep sides of the Vale of Ewyas adding to the Honddu's flow. These tributaries are classed as ordinary watercourses for which MCC are the Risk Management Authority.

The steep sided topography within the northern part of the SFRA means there are areas of higher elevation at the northwestern and northeastern part of the region. In some places, the SFRA measures less than 3km in width. Therefore, the topography and shape of the catchment influences surface water runoff, whereby heavy rainfall can result in very rapid runoff and responses from watercourses.

3.2 History of Flooding

LLFA records of historic flood events within the Honddu SFRA are mainly located adjacent to the Afon Honddu, particularly in Pandy where numerous properties, local businesses and the A465 trunk road were affected during Storm Dennis (February 2020) and Storm Bert (November 2024).

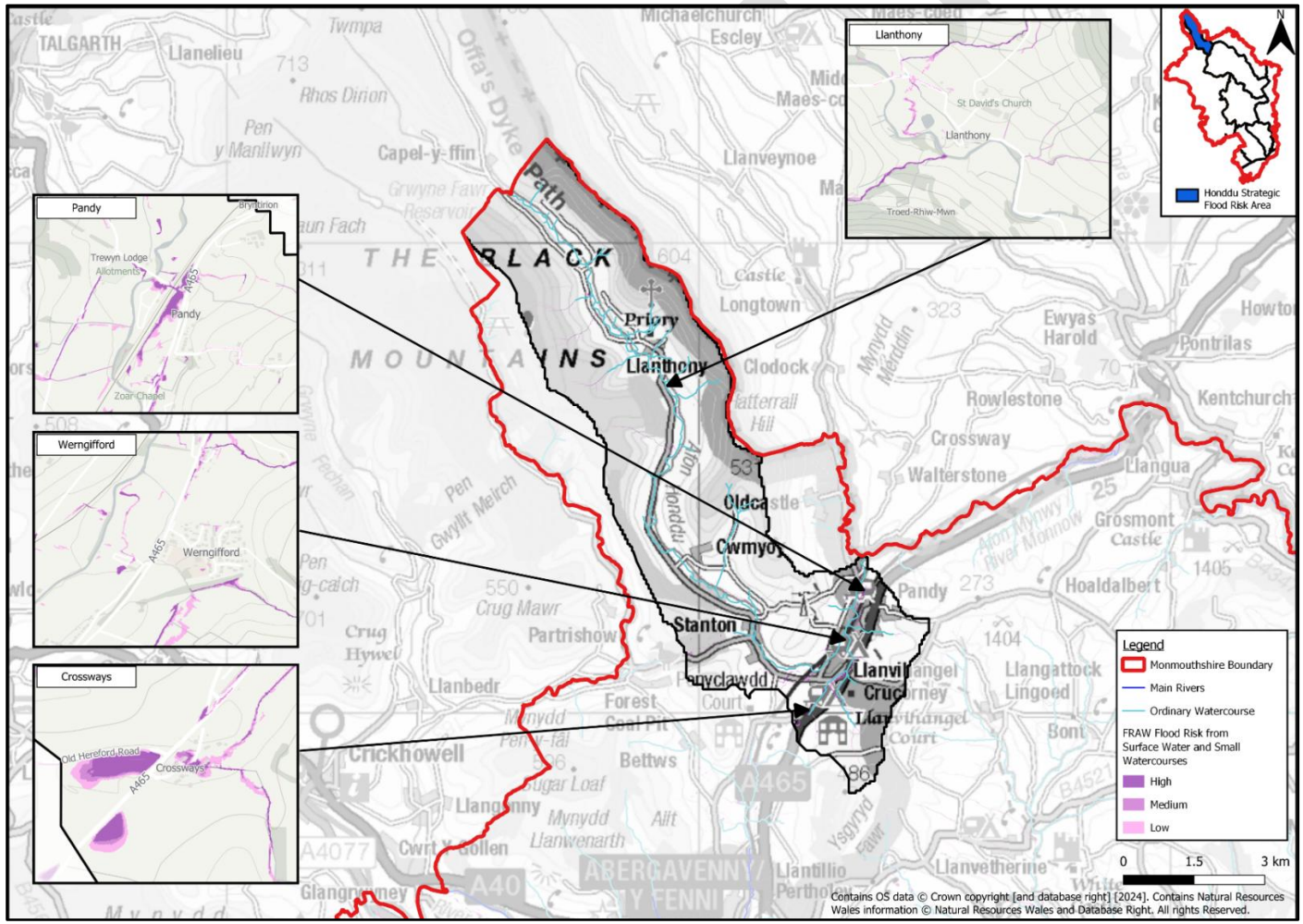
Areas of Cwmyoy and Wern Gifford are shown on the FRAW maps to be at high risk of fluvial and pluvial flooding, with properties having been affected from surface water runoff and ordinary watercourses in the past.

At Llanthony, there have been instances of the Afon Honddu overtopping its banks, flooding adjacent gardens and land, whilst ground water has also been an issue at this location during times of flooding. Due to the steep topography and flashy rural nature of the smaller tributaries, there have been instances of small culverts overtopping due to capacity exceedance and blockage throughout the catchment. This has led to localised issues along roads and a small number of properties.

3.3 Flood Risk from Surface Water & Small Watercourses (Pluvial)

Flood risk from surface water and small watercourses within the Honddu SFRA can be found on NRW's Flood Risk Assessment Wales (FRAW) map. Small watercourses are defined as those ordinary watercourses with a catchment of <3km². The main areas at risk are highlighted in Figure 3 below.

Figure 3. Honddu SFRA FRAW Map - Surface Water & Small Watercourses (Pluvial)



Using the Communities at Risk Register (CaRR), an assessment of flood risk from surface water and small watercourses has been undertaken. The CaRR's *"Addresses at Risk"* GIS layer has been used to assess Residential, Non-Residential Properties and Key Services at risk.

As shown in Table 2, 7 residential properties are shown to be at high risk, the majority of these are located in the south of the SFRA close to the A465. The other residential properties that are at high risk of surface water flooding are located further north, within areas of low elevation in the Vale of Ewyas, where the Afon Honddu flows.

Residential properties at medium and low risk of flooding are also located in the south near Llanvihangel Crucorney, Wern Gifford and Pandy. In total there are 9 residential properties at medium risk and 22 at a low risk.

Non-residential properties and Key Services at risk of surface water flooding are also found close to the village of Llanvihangel Crucorney in the south, and along the narrow valley at areas of low elevation in the Vale of Ewyas to the north.

Using the FRAW maps, minor sections of the A465 trunk road and main line railway are shown to be at high risk of surface water flooding; this includes the main railway line between Llanvihangel Crucorney and Pandy in the south of the SFRA and sections of the A465.

The results of the assessment of flood risk from surface water and small watercourses are shown in Table 2 below.

Table 2. Honddu SFRA – Flood Risk Counts from Surface Water and Small Watercourses (Pluvial)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	7	9	22
Non-Residential Properties at risk of flooding (n)	1	1	2
Key Services at risk of flooding (n)	1	0	0
Listed Buildings (n)	0	0	0
Infrastructure (km)			
Primary/Trunk Roads (km)	0.1	0.1	0.3
Main Line Railways (km)	0.1	0	0
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	6.2	2.2	9.4
Ancient Woodland	1.6	0.4	1.5

Country Parks	0	0	0
Local Nature Reserves (LNR)	0	0	0
National Nature Reserves (NNR)	0	0	0
Ramsar Sites	0	0	0
Registered Parks and Gardens	1.2	0.5	1.2
Scheduled Ancient Monuments (SAM)	0.1	0	0.1
Sites of Interest for Nature Conservation (SINC)	0.2	0	0.1
Sites of Special Scientific Interest (SSSI)	0.8	0.3	2
Special Areas of Conservation (SAC)	0	0	0
Special Protection Areas (SPA)	0	0	0

3.4 Flood Risk from Rivers (Fluvial)

Using the Communities at Risk Register (CaRR) and NRW's Flood Risk Assessment Wales (FRAW) map, a high-level assessment of fluvial flood risk has been undertaken, with areas most at risk shown in Figure 4.

The Fluvial dataset has been considered within this Local Strategy as it contains detail on flood risk from larger ordinary watercourses which affect many areas within Monmouthshire. Main river flooding is also included within the dataset, however this falls outside of the scope of this Local Strategy. The high-level assessment has included the approximate separation of areas at risk from either ordinary watercourses or main rivers, the results of which are shown in Table 3.

Locations at risk from other non-local sources of flooding, in this case main river flooding, have been included in brackets in Table 3 for reference.

Figure 4. Honddu SFRA FRAW Map - Rivers (Fluvial)

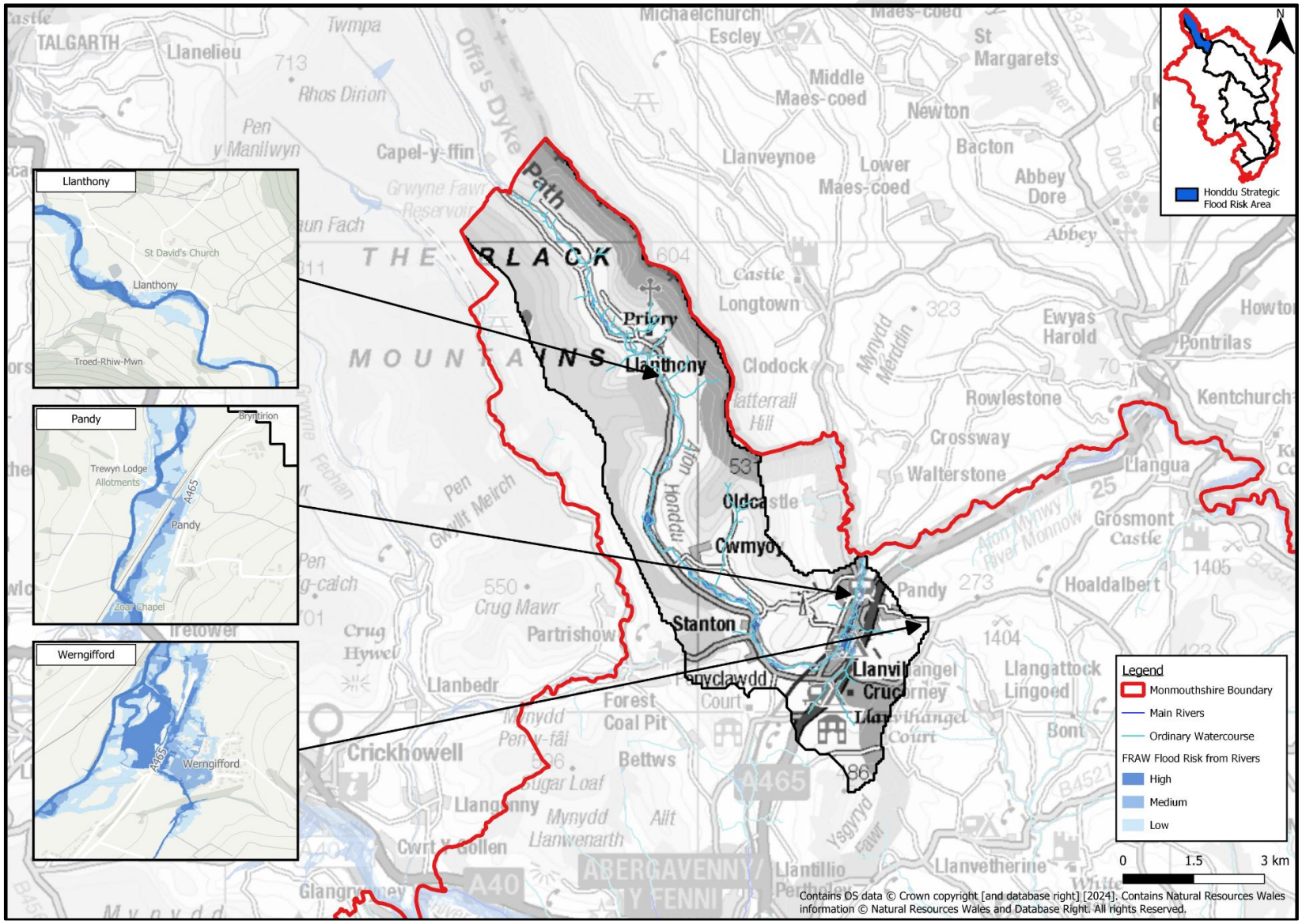


Table 3. Honddu SFRA – Flood Risk Counts from Ordinary Watercourses (Fluvial) (Main river counts in brackets)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	6 (0)	16 (0)	37 (0)
Non-Residential Properties at risk of flooding (n)	0 (0)	2 (0)	4 (0)
Key Services at risk of flooding (n)	0 (0)	1 (0)	1 (0)
Listed Buildings (n)	5 (0)	0 (0)	0 (0)
Infrastructure (km)			
Primary/Trunk Roads (km)	0 (0)	0.1 (0)	0.4 (0)
Main Line Railways (km)	0 (0)	0 (0)	0 (0)
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	23.8 (0)	16.3 (0)	40.9 (0)
Ancient Woodland	7 (0)	2.4 (0)	2 (0)
Country Parks	0 (0)	0 (0)	0 (0)
Local Nature Reserves (LNR)	0 (0)	0 (0)	0 (0)
National Nature Reserves (NNR)	0 (0)	0 (0)	0 (0)
Ramsar Sites	0 (0)	0 (0)	0 (0)
Registered Parks and Gardens	0 (0)	0 (0)	0 (0)
Scheduled Ancient Monuments (SAM)	0 (0)	0 (0)	0 (0)
Sites of Interest for Nature Conservation (SINC)	1.9 (0)	1 (0)	2.9 (0)
Sites of Special Scientific Interest (SSSI)	0 (0)	0 (0)	0 (0)
Special Areas of Conservation (SAC)	0 (0)	0 (0)	0 (0)
Special Protection Areas (SPA)	0 (0)	0 (0)	0 (0)

3.5 Flood Risk from Groundwater

Flood risk from groundwater has been considered by reference to three datasets. Geological information has been obtained from the British Geological Survey's 1:625,000 scale solid geology and 1:625,000 scale superficial deposits data layers. Modelled groundwater levels after a winter recharge season with 1% AEP have been obtained from JBA's Groundwater Flood Map. Information regarding JBA's Groundwater Flood Map is contained in Chapter 3 of this Local Strategy.

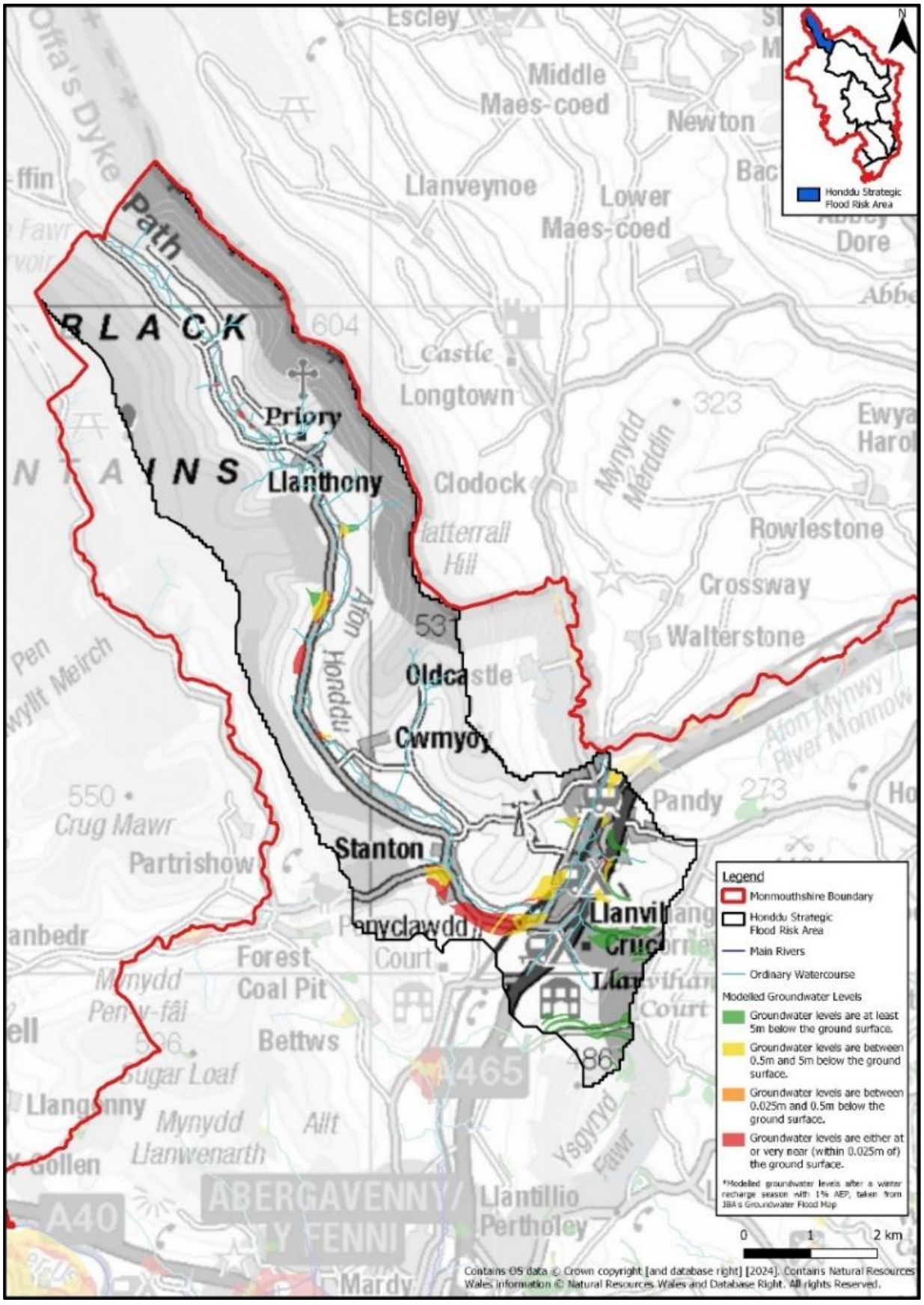
The Honddu SFRA has two main mapped bedrock geologies with roughly equal coverage of the SFRA. Mudstone, siltstone and sandstone follows the Afon Honddu. Sandstone and siltstone interbedded is more prevalent along the outer edges of the SFRA.

Only one significant mapped superficial deposit is present. There is a clay, silt and sand deposit that passes through the southern extent of the SFRA, loosely following the A465.

In the southern section of the SFRA, near Stanton, modelled groundwater levels in the 1% AEP are within 0.025m of the ground surface in locations adjacent to highways, indicating a high risk of groundwater emergence with possible effects to the highway.

Modelled groundwater levels in the 1% AEP are shown in Figure 5. Transparent areas on the mapping indicate a negligible risk of groundwater emergence due to the nature of the local geological deposits and depth of ground water below ground level.

Figure 5. Honddu SFRA – Flood Risk from Groundwater



3.6 Flood Action Plan

The actions proposed within the Honddu SFRA Flood Action Plan are listed in Table 4 below.

Table 4. Honddu SFRA Action Plan

SFRA Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Honddu 1	**Flood Risk Assessment** Undertake a catchment wide assessment of flood risk to identify properties, businesses and infrastructure at greatest risk of flooding from local sources and identify mitigation options.	Honddu SFRA	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Commenced
Honddu 2	**Pandy** Identify and review options to reduce known flood risk from local sources.	Pandy	Preparedness, Protection	8, 9, 10, 14, & 15	Medium Term	Low	Capital	Not Started
Honddu 3	**Cwmyoy** Consider culvert replacement/improvements options at the C1.4/C1.6 Junction near Perth y Crwn Farm.	Cwmyoy	Preparedness, Protection	15	Short Term	Medium	Capital	Not Started
Honddu 4	**Llanthony** Consider culvert replacement/improvement options on the R1 near New House Farm.	Llanthony	Preparedness, Protection	15	Medium Term	Medium	Capital	Commenced
Honddu 5	**Natural Flood Management** Develop and implement previously identified Natural Flood Management options across the Afon Honddu, Pandy catchments and discuss with land owners.	Honddu SFRA	Preparedness, Protection	8, 10 & 15	Medium Term	Medium	Capital	Not Started

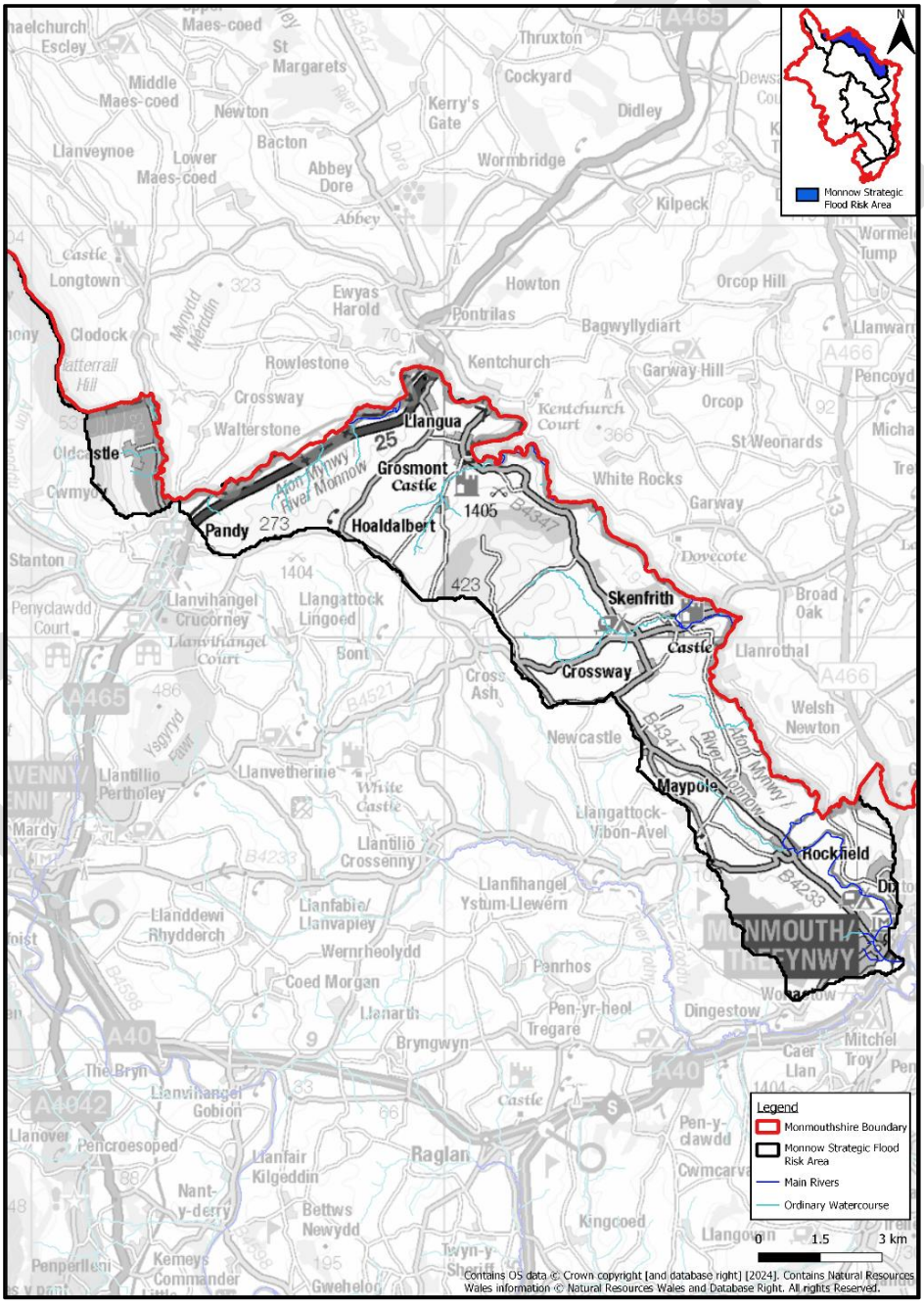
4 Monnow SFRA Flood Action Plan

This Action Plan describes the nature, extent and location of flood risk within the Monnow Strategic Flood Risk Area (SFRA) with an emphasis on local sources of flood risk i.e. surface water, small watercourses and ground water. It also sets out the actions MCC will undertake, or are already in the process of undertaking, to manage flood risk from local sources.

4.1 Monnow SFRA Description

The Monnow SFRA is located in the north east of Monmouthshire, bordering the Honddu, Trothy and Wye SFRAs as shown in Figure 6.

Figure 6. Monnow Strategic Flood Risk Area



The Monnow SFRA covers approximately 76km² and contains a number of small villages and towns which are linked by the B4347 and the B4233 county roads, including Grosmont, Skenfrith, Rockfield and the western edge of Monmouth. Higher elevations can be found in the north, with typically rolling open countryside and woodlands leading to lower elevations in the south at Monmouth. Two castles in the north, managed by the National Trust and Cadw, are situated at Skenfrith and Grosmont.

A network of watercourses flow across the Monnow SFRA, which ultimately flow into the designated main River Monnow. At the western end of the catchment, the Honddu flows into the Monnow at the county boundary north of Pandy. In the north, the Tresenny Brook flows west to east where it converges with the River Monnow at Grosmont. Further south, the Norton Brook also flows west to east and meets the River Monnow at Skenfrith. Other notable ordinary watercourses are located in Rockfield and along Wonastow Road (the Wonastow Brook) and Watery Lane in Monmouth. The River Monnow flows along the eastern boundary of the SFRA, predominantly in a north to south direction, along the English and Welsh border. It flows into the River Wye to the south of Monmouth which continues southwards to the Severn Estuary at Chepstow.

4.2 History of Flooding

LLFA records of historic flooding within the Monnow SFRA show the most significant events are mainly related to the River Monnow. These events have affected numerous residential properties, businesses and local infrastructure in areas such as Skenfrith and Forge Road, Monmouth, details of which have been recorded in published Section 19 Flood Reports available on MCC's website.

Areas at high risk from local sources of flooding include Grosmont, Skenfrith, Rockfield and Monmouth. Whilst the village of Grosmont sits above the flood plain of the River Monnow, small areas of the village are shown to be at risk from the Tresenny Brook and surface water flooding. In addition, blockages to a small unnamed watercourse at the western edge of the village has led to localised flooding in the past.

At Skenfrith, in addition to the high risk of flooding from the River Monnow, the Norton Brook can break its banks to the west of the village where it can affect properties at the northern end first, before flowing along the road through the village. Here it can meet flood waters from the River Monnow during larger flood events, further increasing levels around residential properties. Local land drainage runoff from fields to the west and south can also occur during heavy rainfall.

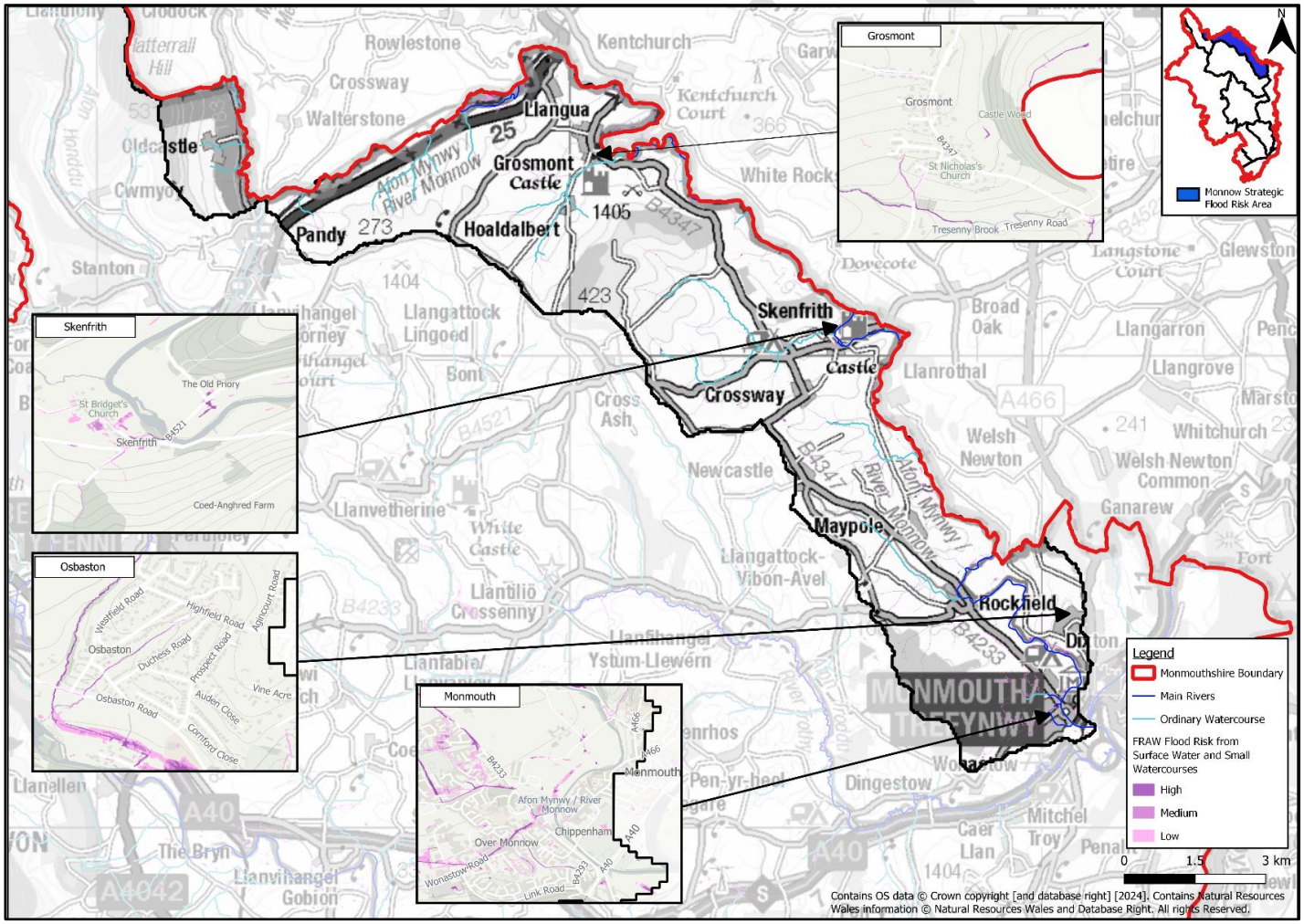
Further south at Rockfield, NRW FRAW maps show a small number of properties at high risk from the River Monnow, where out of bank flows have been known to extend across the B4347. In addition, surface water from adjacent fields can flow onto the B4233 and affect properties at the lower end of the village.

In Monmouth, the main risk at Forge Road is from main river flooding as the properties there are located adjacent to the River Monnow. A number of small ordinary watercourses in this area can become flood locked when levels in the River Monnow are high, causing them to back up, adding to flooding in the area. Within the Overmonnow area, residential properties and local roads have been affected by flooding from ordinary watercourses along Watery Lane, Wonastow Road and Rockfield Road. Both the Watery Lane and Wonastow Brook can become flood locked when the levels in the River Monnow are high, resulting in water backing up across surrounding areas. A large MCC maintained pumping station was constructed in 2007, which operates when the Wonastow Brook cannot discharge, by pumping flood water over the NRW flood defences into the channel of the River Monnow. Areas of Overmonnow are also shown to be at high risk from surface water on NRW's FRAW maps.

4.3 Flood Risk from Surface Water & Small Watercourses (Pluvial)

Flood risk from surface water and small watercourses within the Monnow SFRA can be found on NRW's Flood Risk Assessment Wales (FRAW) map. Small watercourses are defined as those ordinary watercourses with a catchment of <3km². The main areas at risk are highlighted in Figure 7 below.

Figure 7. Monnow SFRA FRAW Map – Surface Water & Small Watercourses



Using the Communities at Risk Register (CaRR), an assessment of flood risk from surface water and small watercourses has been undertaken. The CaRR's *"Addresses at Risk"* GIS layer has been used to assess Residential, Non-Residential Properties and Key Services at risk.

19 residential properties are shown to be at high risk of surface water flooding in the Monnow SFRA, with an additional property recorded as a listed building. 34 properties are shown to be medium risk and 194 at low risk. The majority of these properties at risk are located in the south near Monmouth and Rockfield, with the remaining properties scattered across the catchment.

Non-residential properties and key services at risk of surface water flooding are mainly found in Monmouth.

Minor sections of the A465 are shown to be at risk of flooding from surface water and small watercourses as shown in Table 5.

Table 5. Monnow SFRA – Flood Risk Counts from Surface Water and Small Watercourses (Pluvial)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	19	34	194
Non-Residential Properties at risk of flooding (n)	0	0	8
Key Services at risk of flooding (n)	1	0	3
Listed Buildings (n)	1	0	1
Infrastructure (km)			
Primary/Trunk Roads (km)	0	0.1	0.3
Main Line Railways (km)	0	0	0
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	17	6.7	29.8
Ancient Woodland	8.5	1.6	4.4
Country Parks	0	0	0
Local Nature Reserves (LNR)	0	0	0
National Nature Reserves (NNR)	0	0	0
Ramsar Sites	0	0	0
Registered Parks and Gardens	3.2	0.5	2.2
Scheduled Ancient Monuments (SAM)	0.3	0.1	0.2
Sites of Interest for Nature Conservation (SINC)	3	0.7	2.8
Sites of Special Scientific Interest (SSSI)	1.4	0.2	0.5
Special Areas of Conservation (SAC)	0	0	0
Special Protection Areas (SPA)	0	0	0

4.4 Flood Risk from Rivers (Fluvial)

Using the Communities at Risk Register (CaRR) and NRW's Flood Risk Assessment Wales (FRAW) map, a high-level assessment of fluvial flood risk has been undertaken.

The Fluvial dataset has been considered within this Local Strategy as it contains detail on flood risk from larger ordinary watercourses which affect many areas within Monmouthshire. Main river flooding is also included within the dataset, however this falls outside of the scope of this Local Strategy. The high-level assessment has included the approximate separation of areas at risk from either ordinary watercourses or main rivers, the results of which are shown in Table 6.

Locations at risk from other non-local sources of flooding, in this case main river flooding, have been included in brackets in Table 6 for reference.

Figure 8. Monnow SFRA – Flood Risk from Rivers (Fluvial)

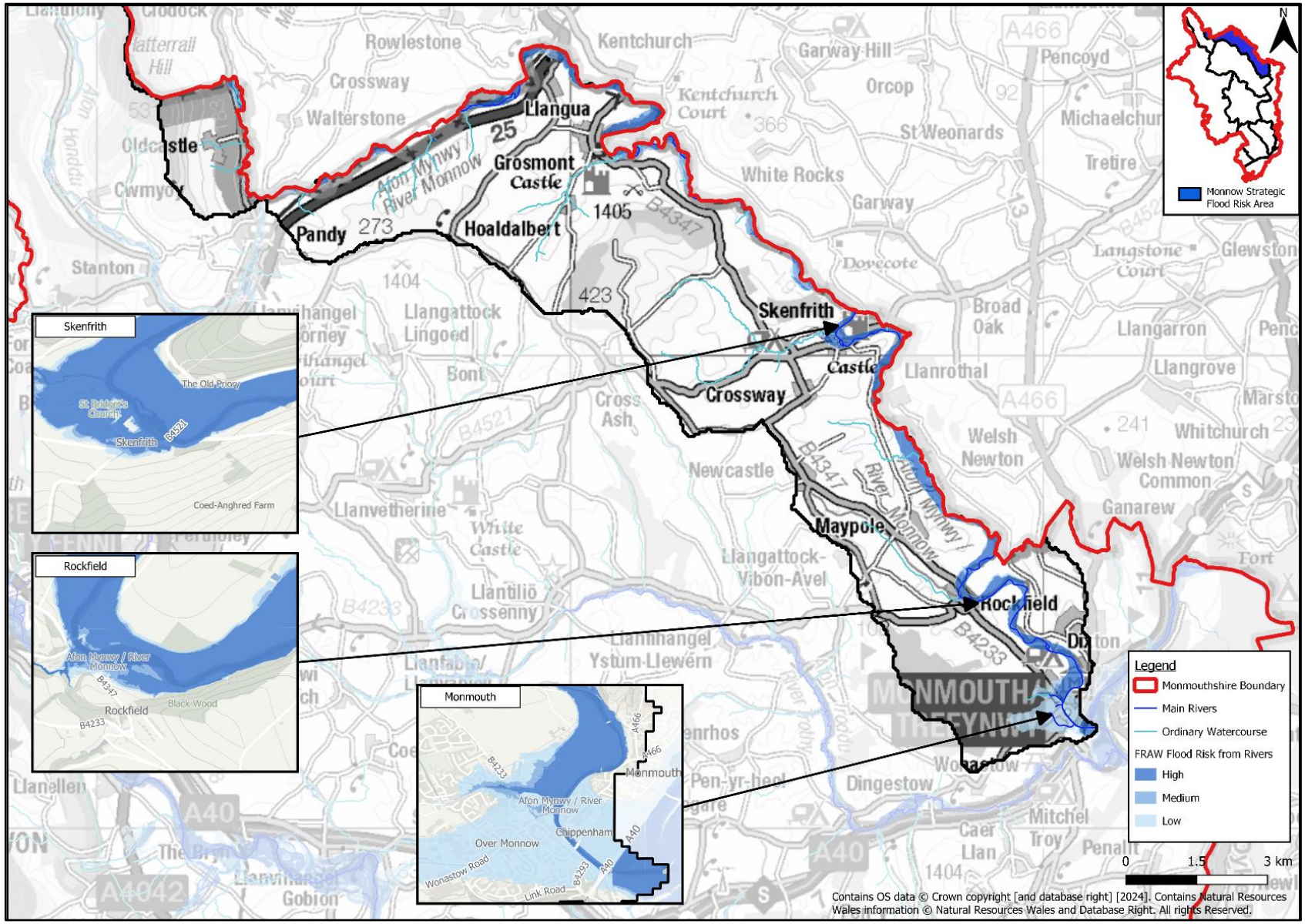


Table 6. Monnow SFRA – Flood Risk Counts from Ordinary Watercourses (Fluvial) (Main river counts in brackets)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	0 (68)	14 (194)	36 (558)
Non-Residential Properties at risk of flooding (n)	0 (33)	0 (79)	0 (83)
Key Services at risk of flooding (n)	0 (13)	0 (6)	3 (21)
Listed Buildings (n)	0 (17)	0 (3)	1 (89)
Infrastructure (km)			
Primary/Trunk Roads (km)	0 (0)	0 (0)	0 (0.8)
Main Line Railways (km)	0 (0)	0 (0)	0 (0.2)
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	13.4 (283.8)	5.1 (60.3)	8.9 (59.1)
Ancient Woodland	1.6 (2.4)	0.4 (0.3)	0.6 (0)
Country Parks	0 (0)	0 (0)	0 (0)
Local Nature Reserves (LNR)	0 (0)	0 (0)	0 (0)
National Nature Reserves (NNR)	0 (0)	0 (0)	0 (0)
Ramsar Sites	0 (0)	0 (0)	0 (0)
Registered Parks and Gardens	0 (0.6)	0 (0)	0 (7.2)
Scheduled Ancient Monuments (SAM)	0 (1)	0 (0.2)	0 (1.3)
Sites of Interest for Nature Conservation (SINC)	0.1 (106.2)	0 (4.5)	0 (5.3)
Sites of Special Scientific Interest (SSSI)	0 (0.4)	0 (0)	0 (0)
Special Areas of Conservation (SAC)	0 (0.4)	0 (0)	0 (0)
Special Protection Areas (SPA)	0 (0)	0 (0)	0 (0)

4.5 Flood Risk from Groundwater

Flood risk from groundwater has been considered by reference to three datasets. Geological information has been obtained from the British Geological Survey's 1:625,000 scale solid geology and 1:625,000 scale superficial deposits data layers. Modelled groundwater levels after a winter recharge season with 1% AEP have been obtained from JBA's Groundwater Flood Map. Information regarding JBA's Groundwater Flood Map is contained in Chapter 3 of this Local Strategy.

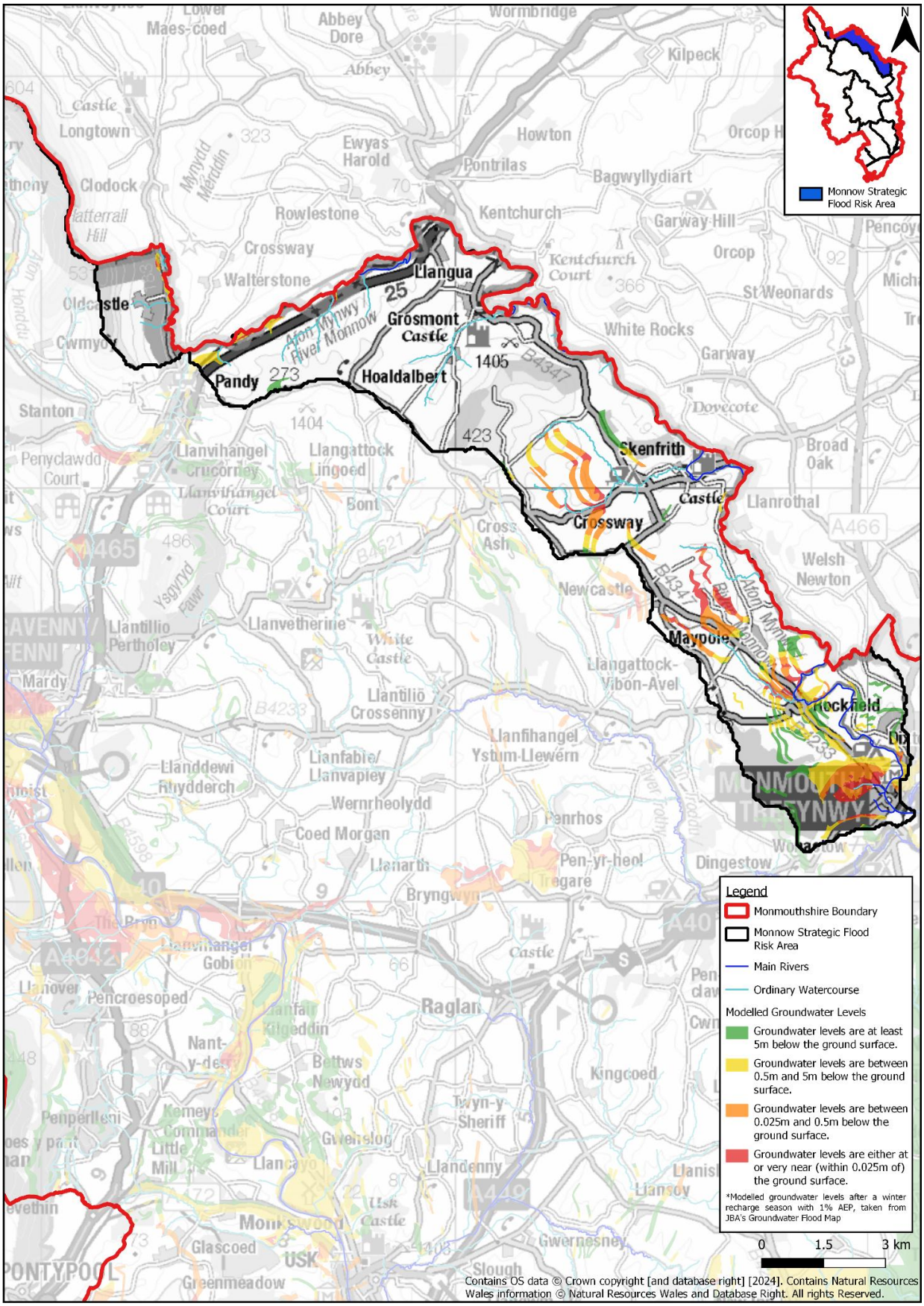
The Monnow SFRA has a mapped bedrock geology comprised almost entirely of mudstone, siltstone and sandstone.

Superficial deposits are mapped in the north of the SFRA, associated with the River Monnow and also in the south of the SFRA, in and around Monmouth associated again with the river Monnow. These deposits comprise of alluvium (clay, silt, sand and gravel) and river terrace deposits (sand and gravel).

Modelled groundwater levels in the 1% AEP are shown in Figure 9. Transparent areas on the mapping indicate a negligible risk of groundwater emergence due to the nature of the local geological deposits and depth of groundwater below ground level. The majority of the Monnow SFRA falls into this category.

Isolated areas of the Monnow SFRA are shown to have modelled groundwater levels in the 1% AEP within 0.025m of the ground surface, including at Monmouth, Rockfield, Maypole, and Crossway. Indicating potential for re-emergence in a very wet year.

Figure 9. Monnow SFRA – Flood Risk from Groundwater



4.6 Flood Action Plan

The actions proposed within the Monnow SFRA Flood Action Plan are listed in Table 7 below.

Table 7. Monnow SFRA Action Plan

SFRA Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Monnow 1	**Flood Risk Assessment** Undertake a catchment wide assessment of flood risk to identify properties, businesses and infrastructure at greatest risk of flooding from local sources.	Monnow SFRA	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Commenced
Monnow 2	**Rockfield Road/Watery Lane Junction, Monmouth - Property Flood Resilience Scheme** Installation of PFR measures at properties identified as being at risk of flooding from local sources.	Monmouth	Protection	15	Short Term	Medium	Capital	Commenced
Monnow 3	**Skenfrith Flood Alleviation Scheme** Work closely with Natural Resources Wales to support their Business Case development and identify opportunities to reduce local flood risk.	Skenfrith	Protection	10 & 15	Short Term	Low	Revenue	Commenced
Monnow 4	**Road Closures** Consider requirement for signage and/or physical barriers to close local roads during significant flooding, including the B4347 at Rockfield Church.	Monnow SFRA	Protection, Recovery & Review	15	Short Term	Low	Revenue	Not Started
Monnow 5	**Grosmont** Review flood risk at Poorscript Gardens and identify options to mitigate flood risk from local sources.	Grosmont	Preparedness, Protection	8, 9, 10, 14, & 15	Medium Term	Low	Revenue	Not Started
Monnow 6	**Natural Flood Management** Develop previously identified Natural Flood Management options across the Norton Brook, Skenfrith catchment and discuss with landowners.	Skenfrith	Preparedness, Protection	8, 10 & 15	Medium Term	Medium	Capital	Not Started
Monnow 7	**Natural Flood Management** Develop and implement previously identified Natural Flood Management scheme at Kingswood, Monmouth and discuss with landowners.	Monmouth	Preparedness, Protection	8, 10 & 15	Short Term	Medium	Capital	Commenced

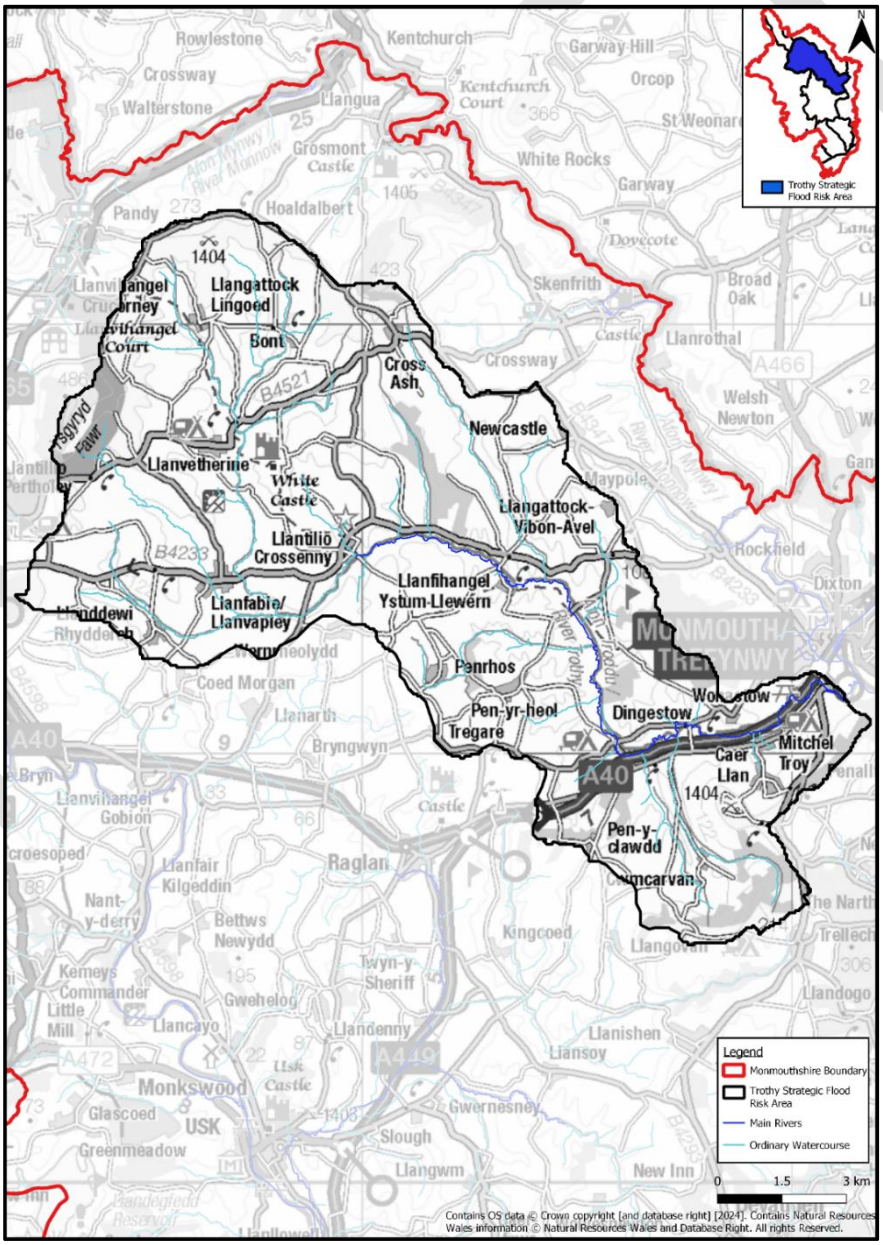
5 Trothy SFRA Flood Action Plan

This Action Plan describes the nature, extent and location of flood risk within the Trothy Strategic Flood Risk Area (SFRA) with an emphasis on local sources of flood risk i.e. surface water, small watercourses and ground water. It also sets out the actions MCC will undertake, or are already in the process of undertaking, to manage flood risk from local sources.

5.1 Trothy SFRA Description

The Trothy Strategic Flood Risk Area (SFRA) is generally located in the northern half of Monmouthshire and borders the Honddu and Monnow SFRAs to the north, as shown in Figure 10. The Olway SFRA is to the south, Usk SFRA to the west and the Wye SFRA to the east. The SFRA covers approximately 145km², which is the second largest in Monmouthshire.

Figure 10. Trothy Strategic Flood Risk Area



The main settlements in this region include Llangattock Lingoed, Cross Ash, Llanvapley and Llantilio Crossenny in the north and northwest. Dingestow, Cwmcarvan and Mitchel Troy are located in the south.

The source of the River Trothy is at Campston Hill at the northern most point of the SFRA, where it then flows southwards towards Llantilio Crossenny. South of this village, the Trothy is a designated main river to its outfall to the River Wye in the south-eastern corner of the SFRA, downstream of the River Wye's confluence with the River Monnow.

Across the catchment, several notable smaller tributaries add to the Trothy's flow along its length. These ordinary watercourses include Full Brook, Tre-rhew Brook, Llanymynach Brook, Pant Brook, Llymon Brook, White Castle Brook, Nant-y-Coy, Nant Wachan, Nant yr Ael-lâs, Cwmcarfan Brook and Garthy Brook.

The topography of the SFRA is generally flat with gentle rolling valleys. The highest elevations are to the west just north of Brynygwenin, and north along the boundaries with the Honddu and Monnow SFRAs.

5.2 History of Flooding

As LLFA, MCC holds records of notable flood events that have affected properties and infrastructure within the Trothy SFRA, these are summarised below. It should be noted this is not intended to be an exhaustive record and doesn't cover more regular minor instances of flooding that can occur.

LLFA records of historic flood events within the Trothy SFRA are mainly located within the rural villages found within the catchment. Properties and local businesses in Mitchel Troy at risk from the River Trothy, have been affected by flooding from this main river, as well as from surface water runoff from higher ground. At Dingestow, the River Trothy and a small ordinary watercourse converge immediately south of the village. During larger events such as Storm Dennis (February 2020) and Storm Bert (November 2024), out of bank flows from these watercourses has resulted in extensive flooding to the R42 and the A40 underpass, surrounding agricultural land and a local business. Other areas where properties have been affected by flooding include Cross Ash, Llanvapley, Llanvetherine, Llantilio Crossenny and Lydart.

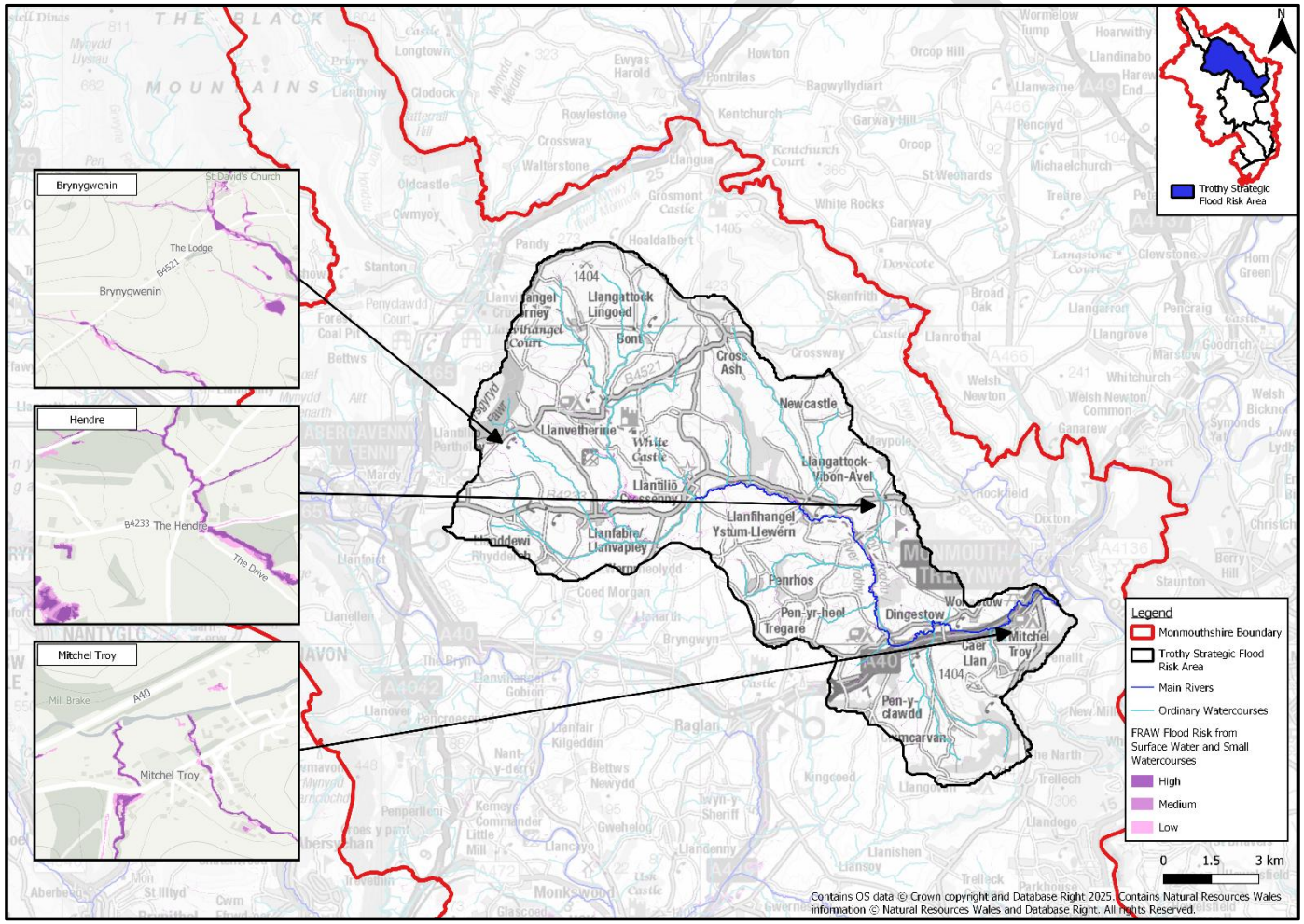
Whilst many local rural roads can experience regular localised flooding, the following other more notable incidents of carriageway only flooding, that has been reported to the LLFA have been at: St. Mabley's Close Llanvapley, R34 Llantilio Crossenny, C13.4 Llangattock Lingoed, C14.4 Llanfihangel Crucorney, C21.2 Hendre, B4293 Lydart and the R45 Tregare.

Whilst other locations are known to have been affected by more localised flooding, such incidents are not always reported or require further investigation.

5.3 Flood Risk from Surface Water & Small Watercourses (Pluvial)

Flood risk from surface water and small watercourses within the Trothy SFRA can be found on NRW's Flood Risk Assessment Wales (FRAW) map. Small watercourses are defined as those ordinary watercourses with a catchment of <3km². The main areas at risk are highlighted in Figure 11 below.

Figure 11. Trothy SFRA FRAW Map – Surface Water & Small Watercourses (Pluvial)



Using the Communities at Risk Register (CaRR), an assessment of flood risk from surface water and small watercourses has been undertaken. The CaRR's *"Addresses at Risk"* GIS layer has been used to assess Residential, Non-Residential Properties and Key Services at risk.

As shown in Table 8, 23 residential properties are shown to be at high risk and are mainly located in the south near Mitchel Troy. The properties shown at medium risk and low risk are spread across the whole of the catchment with the main clusters found near Llanvetherine and Mitchel Troy.

Five non-residential properties are shown to be at high risk of surface water flooding, these are mainly located in the north. The small number of Key Services shown at risk are located predominantly in the west of the SFRA near Llanvetherine and Llantilio Crossenny.

The results of the assessment of flood risk from surface water and small watercourses is shown in Table 8 below.

Table 8. Trothy SFRA – Flood Risk Counts from Surface Water and Small Watercourses (Pluvial)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	23	10	33
Non-Residential Properties at risk of flooding (n)	5	0	3
Key Services at risk of flooding (n)	5	0	0
Listed Buildings (n)	2	0	2
Infrastructure (km)			
Primary/Trunk Roads (km)	0	0	0
Main Line Railways (km)	0	0	0
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	41.4	16.1	62.6
Ancient Woodland	15	3.2	9.7
Country Parks	0	0	0
Local Nature Reserves (LNR)	0	0	0
National Nature Reserves (NNR)	0	0	0
Ramsar Sites	0	0	0
Registered Parks and Gardens	6.6	1.2	4.2
Scheduled Ancient Monuments (SAM)	0.5	0.3	0.9
Sites of Interest for Nature Conservation (SINC)	8	1.6	5.6
Sites of Special Scientific Interest (SSSI)	0.5	0.1	0.4
Special Areas of Conservation (SAC)	0	0	0
Special Protection Areas (SPA)	0	0	0

5.4 Flood Risk from Rivers (Fluvial)

Using the Communities at Risk Register (CaRR) and NRW's Flood Risk Assessment Wales (FRAW) map, a high-level assessment of fluvial flood risk has been undertaken.

The Fluvial dataset has been considered within this Local Strategy as it contains detail on flood risk from larger ordinary watercourses which affect many areas within Monmouthshire. Main river flooding is also included within the dataset, however this falls outside of the scope of this Local Strategy. The high-level assessment has included the approximate separation of areas at risk from either ordinary watercourses or main rivers, the results of which are shown in Table 9.

Locations at risk from other non-local sources of flooding, in this case main river flooding, have been included in brackets in Table 9 for reference.

Figure 12. Trothy SFRA FRAW Map – Rivers (Fluvial)

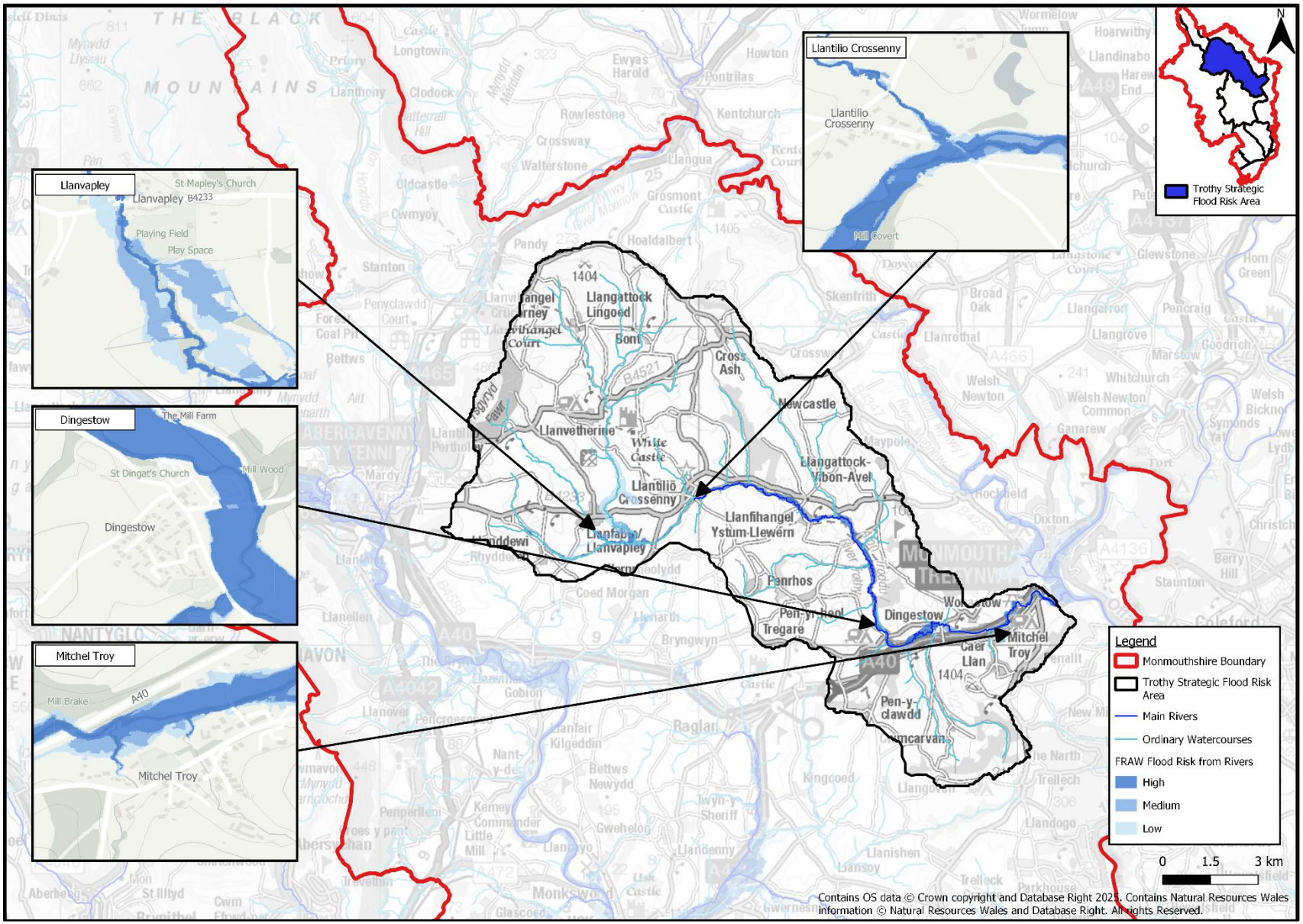


Table 9. Trothy SFRA – Flood Risk Counts from Rivers (Fluvial) (Main river values are shown in brackets)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	2 (1)	0 (1)	4 (3)
Non-Residential Properties at risk of flooding (n)	0 (0)	2 (0)	1 (1)
Key Services at risk of flooding (n)	0 (0)	1 (0)	0 (2)
Listed Buildings (n)	6 (1)	1 (0)	2 (2)
Infrastructure (km)			
Primary/Trunk Roads (km)	0 (0)	0 (0)	0 (0)
Main Line Railways (km)	0 (0)	0 (0)	0 (0)
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	70.5 (134.9)	34.9 (17.3)	85.6 (17.4)
Ancient Woodland	6.2 (2.9)	0.9 (0.2)	1.9 (0)
Country Parks	0 (0)	0 (0)	0 (0)
Local Nature Reserves (LNR)	0 (0)	0 (0)	0 (0)
National Nature Reserves (NNR)	0 (0)	0 (0)	0 (0)
Ramsar Sites	0 (0)	0 (0)	0 (0)
Registered Parks and Gardens	1.8 (7.4)	0.3 (2)	0.7 (2.6)
Scheduled Ancient Monuments (SAM)	0.7 (2.5)	0 (0)	0 (0)
Sites of Interest for Nature Conservation (SINC)	24.2 (51.1)	3.3 (2.1)	4.7 (2.3)
Sites of Special Scientific Interest (SSSI)	0 (0)	0 (0)	0 (0)
Special Areas of Conservation (SAC)	0 (0)	0 (0)	0 (0)
Special Protection Areas (SPA)	0 (0)	0 (0)	0 (0)

5.5 Flood Risk from Groundwater

Flood risk from groundwater has been considered by reference to three datasets. Geological information has been obtained from the British Geological Survey's 1:625,000 scale solid geology and 1:625,000 scale superficial deposits data layers. Modelled groundwater levels after a winter recharge season with 1% AEP have been obtained from JBA's Groundwater Flood Map. Information regarding JBA's Groundwater Flood Map is contained in Chapter 3 of this Local Strategy.

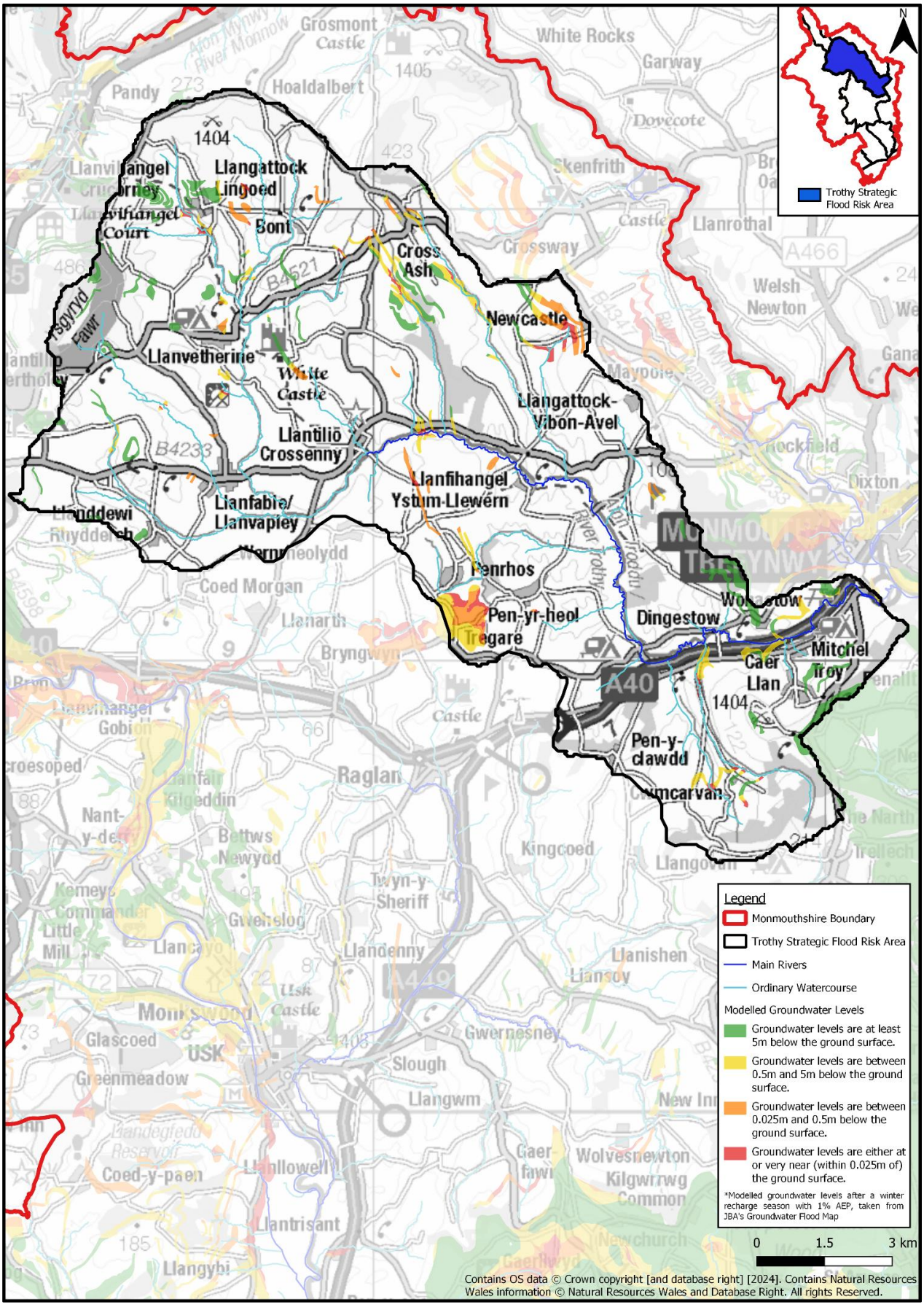
The Trothy SFRA has a bedrock geology of mostly mudstone, siltstone and sandstone. There is a very small presence of sandstone and conglomerate towards the south edge of the SFRA.

Trothy has one significant superficial deposit and two minor deposits. Diamicton (predominantly clay) covers a portion of the centre of the SFRA. Small areas of Alluvium (clay, silt and sand, and sand and gravel) are mapped to the north-east and south-east of Llanvapley. An area of Glacial Sand and Gravel is mapped close to Tregare.

Modelling indicates that through the majority of the Trothy SFRA soils/rock are unlikely to contain significant quantities of shallow groundwater. There are isolated pockets across the SFRA where modelled groundwater levels in the 1% AEP are above 5m below ground level. Many of these appear to correspond with mapped layers of sandstone on 1:50,000 scale geological mapping. A larger area where modelled groundwater levels in the 1% AEP are between ground level and 0.5m of the ground surface is shown around Tregare, associated with the Glacial Sand and Gravel deposit.

Modelled groundwater levels in the 1% AEP are shown in Figure 13. Transparent areas on the mapping indicate a negligible risk of groundwater emergence due to the nature of the local geological deposits and depth of ground water below ground level.

Figure 13. Trothy SFRA – Flood Risk from Groundwater



5.6 Flood Action Plan

The actions proposed within the Trothy SFRA Flood Action Plan are listed in Table 10 below.

Table 10. Trothy SFRA Action Plan

SFRA Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Trothy 1	**Flood Risk Assessment** Undertake a catchment wide assessment of flood risk to identify properties, businesses and infrastructure at greatest risk of flooding from local sources.	Trothy SFRA	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Commenced
Trothy 2	**Mitchel Troy** Undertake an assessment of culvert capacities and flood risk from local sources including at Parc Pentre and along the Garthy Brook.	Mitchel Troy	Protection	14 & 15	Medium Term	Low	Revenue	Not Started
Trothy 3	**Natural Flood Management** Develop and implement previously identified Natural Flood Management schemes at Llantilio Crossenny, Dingestow and Mitchel Troy and discuss with landowners. Review potential for additional NFM measures at these locations.	Trothy SFRA	Preparedness, Protection	8, 10 & 15	Short Term	Medium	Capital	Commenced

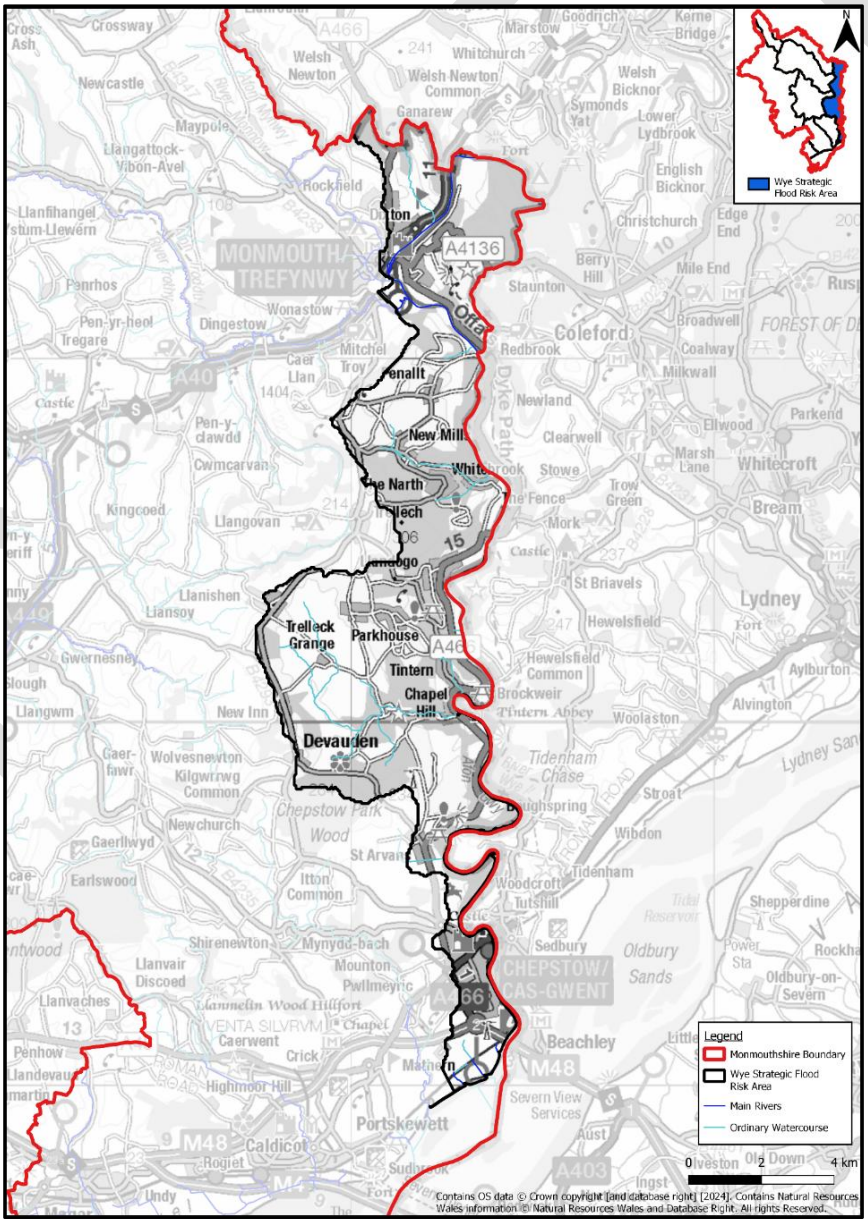
6 Wye SFRA Flood Action Plan

This Action Plan describes the nature, extent and location of flood risk within the Wye Strategic Flood Risk Area (SFRA) with an emphasis on local sources of flood risk i.e. surface water, small watercourses and ground water. It also sets out the actions MCC will undertake, or are already in the process of undertaking, to manage flood risk from local sources.

6.1 Wye SFRA Description

The Wye Strategic Flood Risk Area (SFRA) is one of the larger SFRAs in Monmouthshire covering approximately 81km². The SFRA is located along the eastern boundary of Monmouthshire, where the River Wye flows north to south from Monmouth to Chepstow along the Wye Valley, as shown in Figure 14. To the north, the eastern side of Monmouth falls within this SFRA as do the smaller settlements of The Narth, Llandogo and Tintern. At the southern end is the town of Chepstow where the River Wye meets the Severn Estuary.

Figure 14. Wye Strategic Flood Risk Area



The landscape exhibits a mixture of land uses; predominantly agricultural land, parklands and a number of woodlands and forestry's which fall within the designated Wye Valley National Landscape. Topography along the SFRA typically consists of steep sided slopes and lower areas of flood plain along the River Wye and its valley. At Monmouth, the River Monnow and Trothy join the River Wye at the southern end of the town, whilst the Manor Brook and White Brook fall west - east to the River Wye from The Narth. Downstream at Tintern, the Catbrook, Angidy River and Limekiln Brook fall to the River Wye, which at this location is tidal.

6.2 History of Flooding

As LLFA, MCC holds records of notable flood events from surface water and ordinary watercourses that have affected properties and infrastructure within the Wye SFRA. Properties at Tintern have experienced flooding from events relating to several ordinary watercourses which include the Catbrook, Angidy River and Limekiln Brook. These are typically steep and fast responding watercourses which can result in flash flooding and significant out of bank flows that can affect low lying properties.

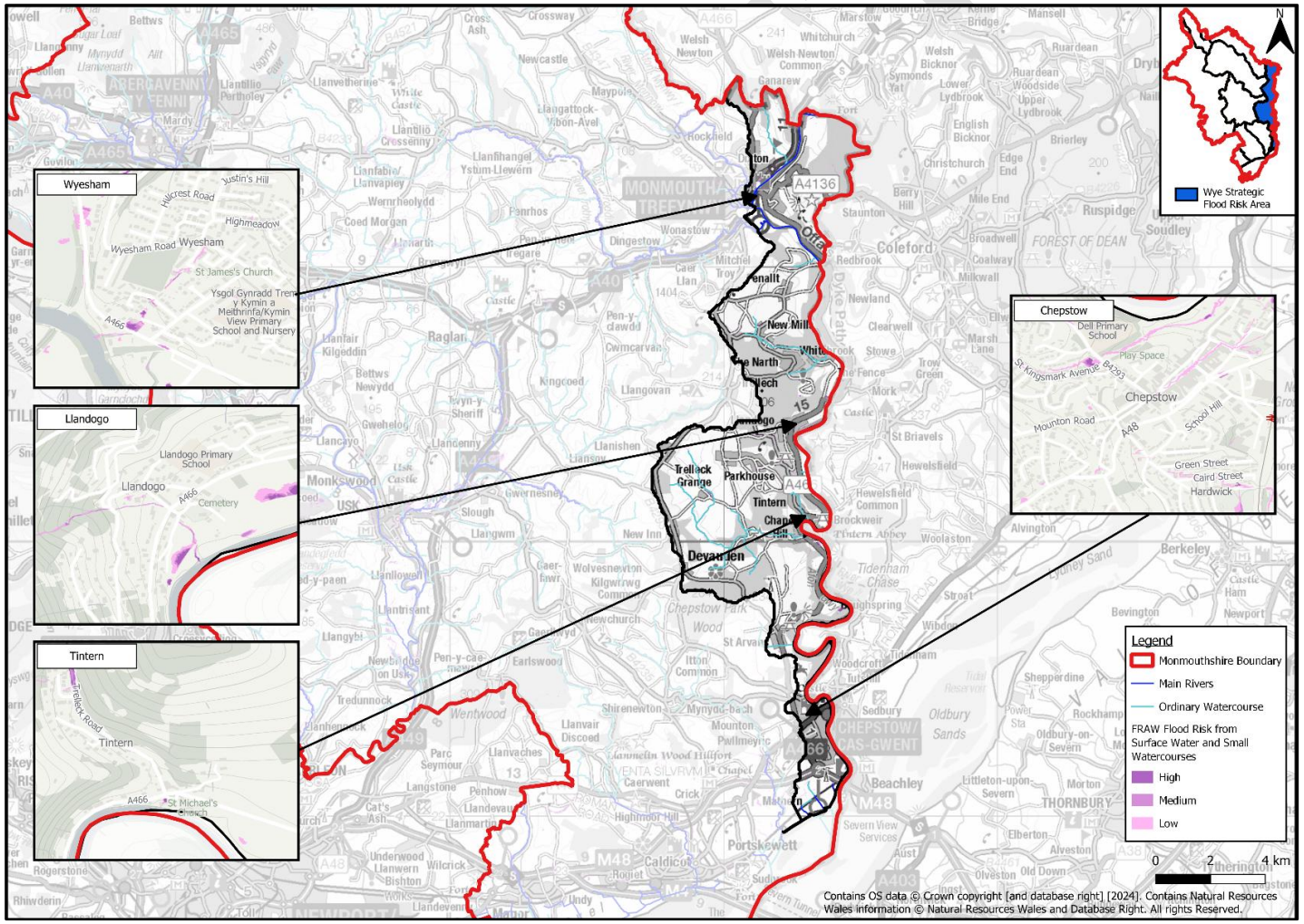
Other areas where properties have been affected include Buckholt, Wyesham, Penallt, Llanishen, Llandogo and The Narth. Properties here are affected from a combination of surface water runoff and ordinary watercourses. Whilst other locations are known to have been affected by more localised flooding, such incidents are not always reported or require further investigation.

In regard to main river flooding from the River Wye, large areas of Monmouth including Riverside Park, Redbrook Road and the tidal reaches through Tintern and Chepstow are particularly prone to significant flooding during larger fluvial and tidal events. As this Local Strategy focusses on local sources of flood risk, details of main river flooding events, such as those that occurred in 2020 in Monmouth and Tintern can be found in previously published Section 19 Flood Reports which are available on MCC's website.

6.3 Flood Risk from Surface Water & Small Watercourses (Pluvial)

Flood risk from surface water and small watercourses within the Wye SFRA can be found on NRW's Flood Risk Assessment Wales (FRAW) map. Small watercourses are defined as those ordinary watercourses with a catchment of <3km². The main areas at risk are highlighted in Figure 15 below.

Figure 15. Wye SFRA FRAW Map – Surface Water & Small Watercourses (Pluvial)



Using the Communities at Risk Register (CaRR), an assessment of flood risk from surface water and small watercourses has been undertaken. The CaRR's *"Addresses at Risk"* GIS layer has been used to assess Residential, Non-Residential Properties and Key Services at risk.

As shown in Table 11, 9 residential properties are shown to be at high risk of surface water flooding in the Wye SFRA. These properties are generally scattered across the SFRA with the majority being in Monmouth and Chepstow. This is partly due to the large areas of impermeable surfaces across these built-up urban areas.

There are 17 properties shown to be at medium risk and 209 at low risk. As with the properties at high risk, the majority of these are scattered throughout the SFRA, with the largest concentrations found in Monmouth, Tintern and Chepstow.

Non-residential properties and key services at risk of surface water flooding are found in the centre of the SFRA and at Monmouth and Chepstow.

Minor sections of the A466 and M48 (trunk road) are at medium and low risk of flooding from surface water and small watercourses.

The results of the assessment of flood risk from surface water and small watercourses is shown in Table 11 below.

Table 11. Wye SFRA – Flood Risk Counts from Surface Water and Small Watercourses (Pluvial)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	9	17	209
Non-Residential Properties at risk of flooding (n)	0	6	39
Key Services at risk of flooding (n)	1	3	5
Listed Buildings (n)	0	1	5
Infrastructure (km)			
Primary/Trunk Roads (km)	0	0.1	0.3
Main Line Railways (km)	0	0	0
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	8.1	3.7	16.8
Ancient Woodland	3.5	1.7	7.7
Country Parks	0	0	0
Local Nature Reserves (LNR)	0.1	0.1	0.7
National Nature Reserves (NNR)	0.1	0	0.2
Ramsar Sites	0	0	0
Registered Parks and Gardens	0.2	0.3	1.9
Scheduled Ancient Monuments (SAM)	0.5	0.1	0.6
Sites of Interest for Nature Conservation (SINC)	2.3	0.9	3.7
Sites of Special Scientific Interest (SSSI)	0.5	0.69	2.61
Special Areas of Conservation (SAC)	0.4	0.5	1.8
Special Protection Areas (SPA)	0	0	0

6.4 Flood Risk from Rivers (Fluvial)

Using the Communities at Risk Register (CaRR) and NRW's Flood Risk Assessment Wales (FRAW) map, a high-level assessment of fluvial flood risk has been undertaken.

The Fluvial dataset has been considered within this Local Strategy as it contains detail on flood risk from larger ordinary watercourses which affect many areas within Monmouthshire. Main river flooding is also included within the dataset, however this falls outside of the scope of this Local Strategy. The high-level assessment has included the approximate separation of areas at risk from either ordinary watercourses or main rivers, the results of which are shown in Table 12.

Locations at risk from other non-local sources of flooding, in this case main river flooding, have been included in brackets in Table 12 for reference.

Figure 16. Wye SFRA FRAW Map – Rivers (Fluvial)

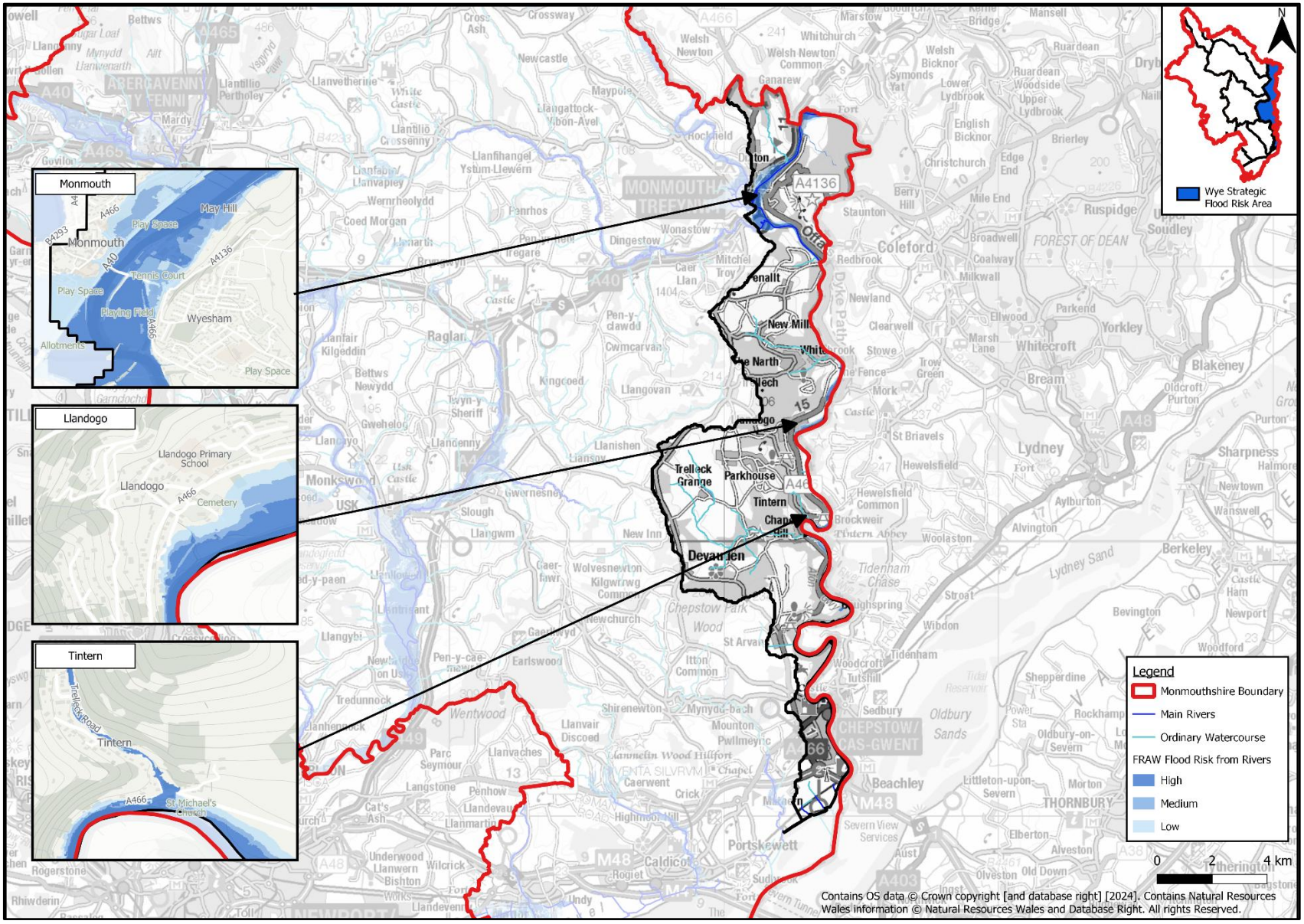


Table 12. Wye SFRA – Flood Risk Counts from Ordinary Watercourses (Fluvial) (Main river counts in brackets)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	8 (5)	4 (20)	8 (121)
Non-Residential Properties at risk of flooding (n)	0 (2)	0 (8)	0 (52)
Key Services at risk of flooding (n)	2 (1)	0 (3)	0 (14)
Listed Buildings (n)	5 (6)	0 (3)	1 (51)
Infrastructure (km)			
Primary/Trunk Roads (km)	0.1 (0.3)	0 (1.6)	0.1 (4.9)
Main Line Railways (km)	0 (0)	0 (0)	0 (0)
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	10.5 (133.0)	1.1 (27.1)	3.2 (44.8)
Ancient Woodland	7.1(9.7)	0.8 (1.7)	1.4 (0)
Country Parks	0 (0)	0 (0)	0 (0)
Local Nature Reserves (LNR)	0 (0)	0 (0)	0 (0)
National Nature Reserves (NNR)	0 (0.1)	0 (0.2)	0 (0.6)
Ramsar Sites	0 (0)	0 (0)	0 (0)
Registered Parks and Gardens	0 (1.9)	0 (0.3)	0 (6.3)
Scheduled Ancient Monuments (SAM)	0 (0.1)	0 (0)	0.3 (2.1)
Sites of Interest for Nature Conservation (SINC)	3.5 (5.6)	0.5 (0.4)	0.8 (0.5)
Sites of Special Scientific Interest (SSSI)	0.1 (120.3)	0 (5.0)	0 (7.3)
Special Areas of Conservation (SAC)	0.1 (120.4)	0 (3.6)	0 (7.3)
Special Protection Areas (SPA)	0 (0)	0 (0)	0 (0)

6.5 Flood Risk from Groundwater

Flood risk from groundwater has been considered by reference to three datasets. Geological information has been obtained from the British Geological Survey's 1:625,000 scale solid geology and 1:625,000 scale superficial deposits data layers. Modelled groundwater levels after a winter recharge season with 1% AEP have been obtained from JBA's Groundwater Flood Map. Information regarding JBA's Groundwater Flood Map is contained in Chapter 3 of this Strategy.

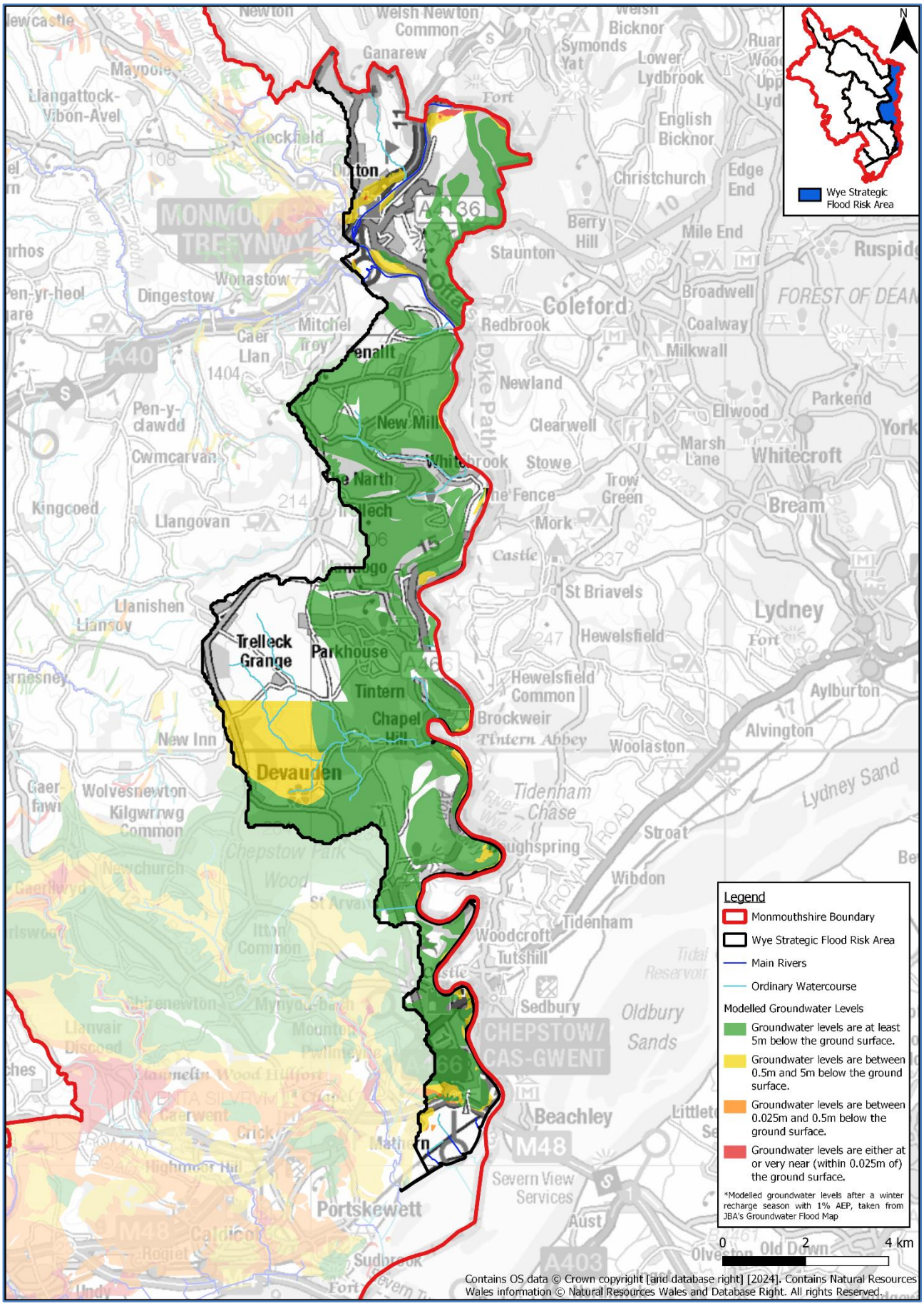
The bedrock geology in the Wye SFRA is primarily interbedded sandstone and conglomerate. There are also small regions of limestone with subordinate sandstone and argillaceous rocks towards the south of the SFRA.

The Wye SFRA contains very little superficial deposit.

Across most of the Wye SFRA modelled groundwater levels in the 1% AEP are at least 5 metres below the ground surface. Isolated areas in the north and south of the Wye SFRA and a larger area north of Devauden have modelled groundwater levels in the 1% AEP between 0.5 and 5m below ground level.

Modelled groundwater levels in the 1% AEP are shown in Figure 17. Transparent areas on the mapping indicate a negligible risk of groundwater emergence due to the nature of the local geological deposits and depth of ground water below ground level.

Figure 17. Wye SFRA – Flood Risk from Groundwater



6.6 Flood Action Plan

The actions proposed within the Wye SFRA Flood Action Plan are listed in Table 13 below.

Table 13. Wye SFRA Action Plan

SFRA Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Wye 1	**Flood Risk Assessment** Undertake a catchment wide assessment of flood risk to identify properties, businesses and infrastructure at greatest risk of flooding from local sources.	Wye SFRA	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Commenced
Wye 2	**Redbrook Road, Monmouth** Consider options to reduce flood risk to properties and prevention of water flowing through the old railway embankment.	Monmouth	Preparedness, Protection	10 & 15	Medium Term	Medium	Capital	Not Started
Wye 3	**Tudor Road, Wyesham** Construction of cut off ditch to prevent overland runoff affecting properties.	Wyesham	Protection	15	Short Term	Medium	Capital	Commenced
Wye 4	**Wye Bridge, Monmouth** Consider viability over the provision and installation of a CCTV camera to remotely monitor debris accumulation levels on the Wye Bridge, Monmouth.	Monmouth	Preparedness	4, 5, 10 & 15	Medium Term	Low	Capital	Not started
Wye 5	**Llandogo** Identify and implement options to reduce flood risk from blockages of the culvert inlet opposite the Sloop Inn.	Llandogo	Protection	15	Short Term	Medium	Capital	Commenced
Wye 6	**Tintern Property Flood Resilience** Working with other Risk Management Authorities, review viability of property flood resilience scheme for properties at risk from all sources of flooding.	Tintern	Preparedness, Protection	10 & 15	Long Term	High	Capital	Not Started
Wye 7	**Angidy Valley Catchment Study** Undertake a detailed assessment of flood risk and potential mitigation options.	Tintern	Preparedness, Protection	8, 9, 10, 14 & 15	Long Term	Medium	Capital	Not Started
Wye 8	**Tintern River Gauge** Consider viability of installing a river level gauge at Tintern to monitor tidal levels to aid road closure forecasting.	Tintern	Preparedness	5 & 15	Long Term	Medium	Capital	Commenced

Wye 9	**Tintern Community Flood Plan** Support the local community in developing a community flood plan.	Tintern	Preparedness	4 & 7	Medium Term	Low	Revenue	Not Started
Wye 10	**Tintern** Undertake a detailed survey of the Catbrook and consider potential works to reduce flood risk along Trellech Road, the A466 and properties at and adjacent to Fryers Row.	Tintern	Protection, Recovery and Review	8, 14 & 15	Short Term	Medium	Capital	Commenced
Wye 11	**Natural Flood Management** Develop previously identified Natural Flood Management options across the catchment of the Limekiln Brook, Tintern and discuss with landowners.	Tintern	Preparedness, Protection	8, 10 & 15	Long Term	Medium	Capital	Not Started

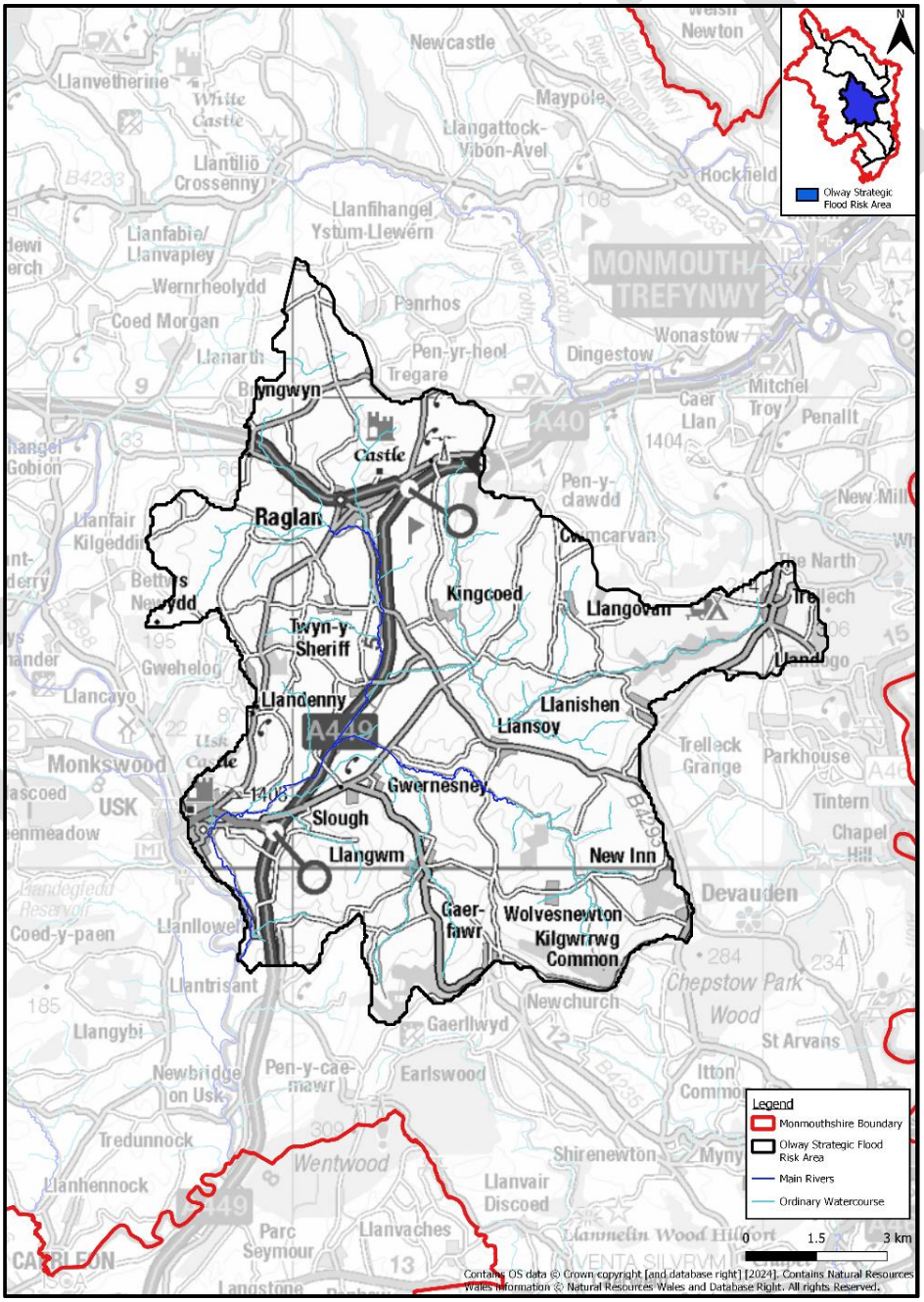
7 Olway SFRA Flood Action Plan

This Action Plan describes the nature, extent and location of flood risk within the Olway Strategic Flood Risk Area (SFRA) with an emphasis on local sources of flood risk i.e. surface water, small watercourses and ground water. It also sets out the actions MCC will undertake, or are already in the process of undertaking, to manage flood risk from local sources.

7.1 Olway SFRA Description

The Olway SFRA is located in the centre of Monmouthshire and covers approximately 115km² making it the third largest SFRA in the County. The Olway is a tributary to the River Usk, which it meets downstream of Usk town at Llanllowell, as shown in Figure 18.

Figure 18. Olway Strategic Flood Risk Area



The predominantly rural settlements in this SFRA are typically surrounded by pastureland and woodlands, include Raglan in the north, Trellech in the east, Llangwm in the south. The eastern edge of Usk also falls within this SFRA boundary which runs through the centre of the town. A number of ancient monuments are located within the SFRA including Trecastle motte and bailey near Raglan and Gaer Fawr hillfort near Llangwm, as well as castles at Raglan and Usk. The SFRA also has Sites of Special Scientific Interest, including Cwrt-y-Bela a Springdale, which is located in the southwest and Cobbler's Plain Meadows in the northeast.

The Olway Brook and Nant y Wilcae are the two largest watercourses within this SFRA, both of which are designated main rivers for which NRW are the Risk Management Authority. The Nant y Wilcae flows from the north, where at Raglan it is fed by the Barton Brook, an ordinary watercourse, at the downstream end of the village, before joining the Olway Brook south of Llandenny. Another main river, the Pill Brook, also joins the Olway south of Llandenny. The Olway then flows to Usk, where a number of properties are protected by an NRW maintained flood embankment, before continuing south where it joins the River Usk downstream of Llanllowell. Notable named ordinary watercourses include the Wecha Brook north of Llandenny, Dyffryn Brook and the Nant y March at Llangwm, and the Penarth Brook near Trellech.

The topography of the Olway SFRA is generally low lying but has higher elevations in the northwest near Rhiw-Iâs and Trellech in the east, which is close to the Wye SFRA border. Higher elevations are also located in the southern region of the Olway SFRA which stretches from Gaer-fawr to Devauden in the east.

7.2 History of Flooding

As LLFA, MCC hold records of a number of notable flood events relating to ordinary watercourses and surface water that have affected properties and infrastructure within the Olway SFRA. Areas at high risk from local sources and those that have experienced flooding in recent years are spread across the SFRA.

In the north at Raglan, properties and local roads have been affected by the Barton Brook, with the channel being significantly narrowed where it runs adjacent to properties at the northern end of the village. At the southern end of Raglan, the Nant y Wilcae becomes a designated main river when it flows beneath the R62 Usk Road. In this area, the channel's capacity can be exceeded resulting in localised flooding.

Further south at Gwernesney, flooding from a small ordinary watercourse and overland runoff can add to out of bank flows from the Olway Brook, resulting in flooding to large areas of agricultural land, including Usk Showground. This flooding can also affect a small number of local properties and the B4235. At Llangwm, the Dyffryn Brook and the Nant y March flow immediately adjacent to numerous properties before converging in the centre of the village. A small number of properties have been affected by flooding from both of these watercourses in the past.

The eastern side of Usk falls within the Olway SFRA, where the Olway Brook, a designated main river, can affect Chepstow Road and surrounding properties, some of which are defended by an NRW embankment at the rear of Black Barn Lane. At the north eastern edge of the town, residential properties and Monmouth Road are susceptible to surface water flooding, with this area being badly affected during a significant rainfall event in May 2023.

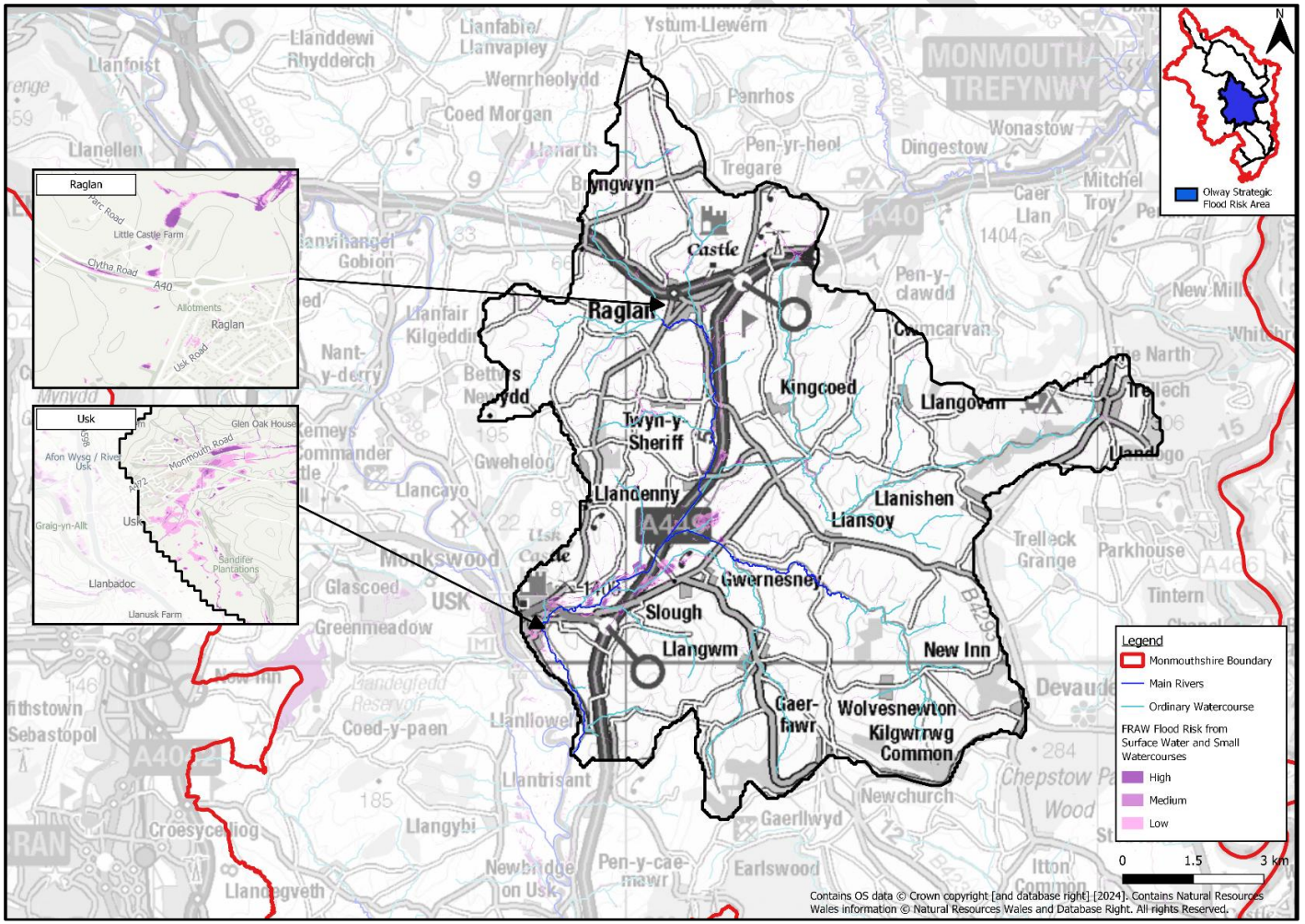
Other notable events that have been reported to the LLFA include those at Trellech and Llanllowell. Following repeated flood events in several villages, MCC successfully applied for and delivered property flood resilience schemes to properties in Llangwm (2021) and Llanllowell (2023).

It should be noted the above is not intended to be an exhaustive list and doesn't cover more regular minor instances of flooding that can occur.

7.3 Flood Risk from Surface Water & Small Watercourses (Pluvial)

Flood risk from surface water and small watercourses within the Olway SFRA can be found on NRW's Flood Risk Assessment Wales (FRAW) map. Small watercourses are defined as those ordinary watercourses with a catchment of <3km². The main areas at risk are highlighted in Figure 19 below.

Figure 19. Olway SFRA FRAW Map – Surface Water & Small Watercourses (Pluvial)



Using the Communities at Risk Register (CaRR), an assessment of flood risk from surface water and small watercourses has been undertaken. The CaRR's *"Addresses at Risk"* GIS layer has been used to assess Residential, Non-Residential Properties and Key Services at risk.

As shown in Table 14, 19 residential properties are shown to be at high risk. These properties are spread across the SFRA with the highest numbers located in and near to Raglan, Usk, Gwernesney and along the B4235 near Llangwm.

Properties at medium and low risk of flooding are mainly located in Usk and Raglan. In total there are 9 residential properties at medium risk and 55 at low risk.

Non-residential properties and Key Services at risk of surface water flooding are mainly found in and near to Raglan.

Using the FRAW maps, minor sections of the A449 trunk road are shown to be at high and low risk of surface water flooding.

The results of the assessment of flood risk from surface water and small watercourses is shown in Table 14 below.

Table 14. Olway SFRA – Flood Risk Counts from Surface Water and Small Watercourses (Pluvial)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	19	9	55
Non-Residential Properties at risk of flooding (n)	1	1	7
Key Services at risk of flooding (n)	2	0	1
Listed Buildings (n)	0	0	0
Infrastructure (km)			
Primary/Trunk Roads (km)	0.1	0	0.3
Main Line Railways (km)	0	0	0
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	35.2	14.8	67.3
Ancient Woodland	6.8	1.7	6
Country Parks	0	0	0
Local Nature Reserves (LNR)	0	0	0
National Nature Reserves (NNR)	0	0	0
Ramsar Sites	0	0	0
Registered Parks and Gardens	1	0.3	0.8
Scheduled Ancient Monuments (SAM)	0.8	0.4	1.8
Sites of Interest for Nature Conservation (SINC)	4	1.1	3.5
Sites of Special Scientific Interest (SSSI)	0.7	0.2	0.5
Special Areas of Conservation (SAC)	0	0	0
Special Protection Areas (SPA)	0	0	0

7.4 Flood Risk from Rivers (Fluvial)

Using the Communities at Risk Register (CaRR) and NRW's Flood Risk Assessment Wales (FRAW) map, a high-level assessment of fluvial flood risk has been undertaken.

The Fluvial dataset has been considered within this Local Strategy as it contains detail on flood risk from larger ordinary watercourses which affect many areas within Monmouthshire. Main river flooding is also included within the dataset, however this falls outside of the scope of this Local Strategy. The high-level assessment has included the approximate separation of areas at risk from either ordinary watercourses or main rivers, the results of which are shown in Table 15.

Locations at risk from other non-local sources of flooding, in this case main river flooding, have been included in brackets in Table 15 for reference.

Figure 20. Olway SFRA FRAW Map – Rivers (Fluvial)

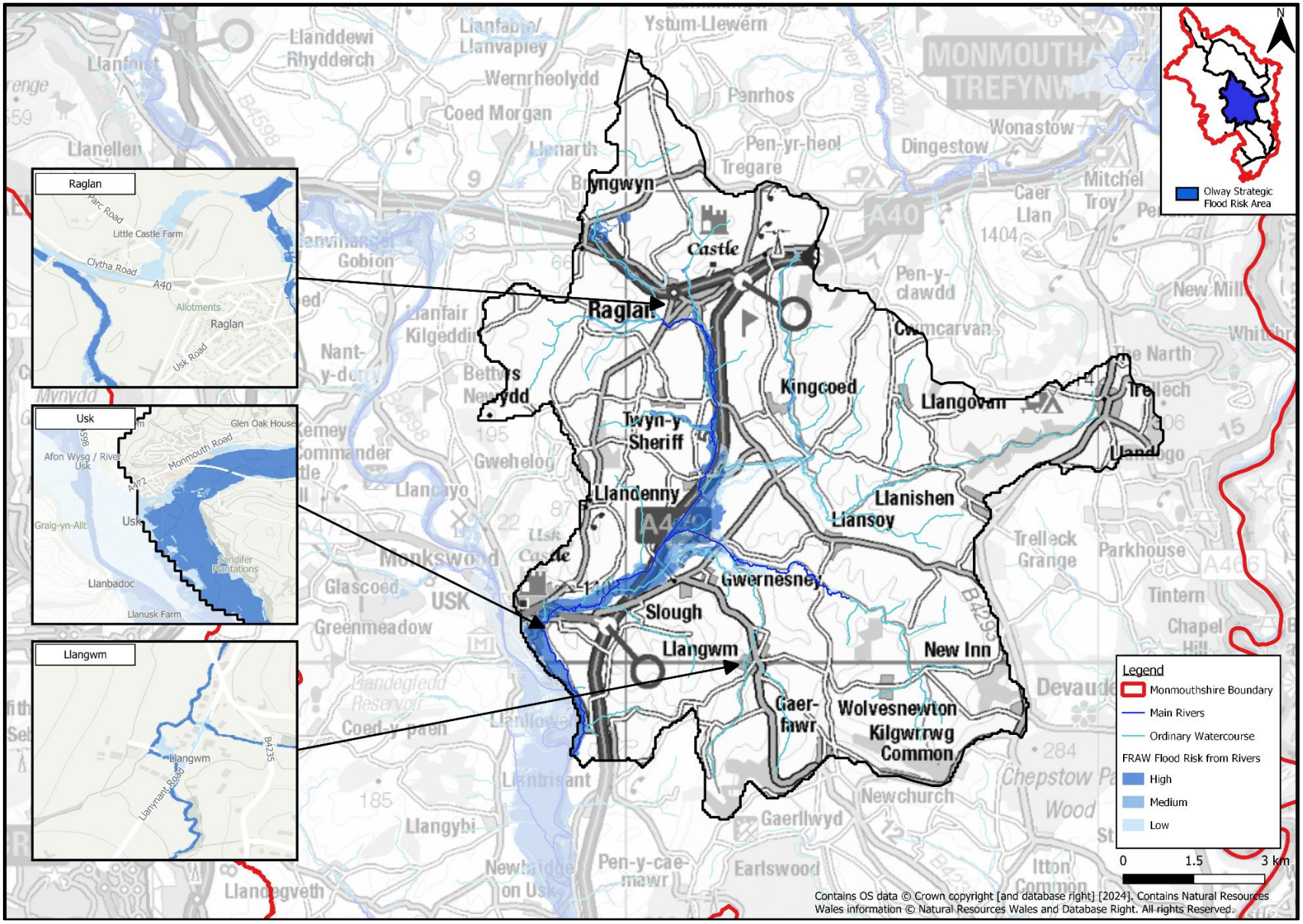


Table 15. Olway SFRA – Flood Risk Counts from Rivers (Fluvial) (Main river counts in brackets)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	4 (0)	2 (1)	9 (55)
Non-Residential Properties at risk of flooding (n)	0 (0)	0 (0)	9 (3)
Key Services at risk of flooding (n)	1 (0)	0 (0)	1 (1)
Listed Buildings (n)	1 (0)	0 (0)	1 (15)
Infrastructure (km)			
Primary/Trunk Roads (km)	0 (0)	0 (0)	0.4 (0.1)
Main Line Railways (km)	0 (0)	0 (0)	0 (0)
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	52.9 (128.8)	10.7 (37.1)	45.7 (62.0)
Ancient Woodland	3.0 (0.5)	0.4 (0)	0.7 (0)
Country Parks	0 (0)	0 (0)	0 (0)
Local Nature Reserves (LNR)	0 (0)	0 (0)	0 (0)
National Nature Reserves (NNR)	0 (0)	0 (0)	0 (0)
Ramsar Sites	0 (0)	0 (0)	0 (0)
Registered Parks and Gardens	2.3 (0)	0.3 (0)	0.8 (0)
Scheduled Ancient Monuments (SAM)	2.4 (3.8)	0.3 (0.4)	0.8 (0.4)
Sites of Interest for Nature Conservation (SINC)	8.7 (17.8)	1.0 (0.7)	2.8 (0.8)
Sites of Special Scientific Interest (SSSI)	0.3 (0.2)	0 (0)	0 (0)
Special Areas of Conservation (SAC)	0 (0.2)	0 (0)	0 (0)
Special Protection Areas (SPA)	0 (0)	0 (0)	0 (0)

7.5 Flood Risk from Groundwater

Flood risk from groundwater has been considered by reference to three datasets. Geological information has been obtained from the British Geological Survey's 1:625,000 scale solid geology and 1:625,000 scale superficial deposits data layers. Modelled groundwater levels after a winter recharge season with 1% AEP have been obtained from JBA's Groundwater Flood Map. Information regarding JBA's Groundwater Flood Map is contained in Chapter 3 of this Strategy.

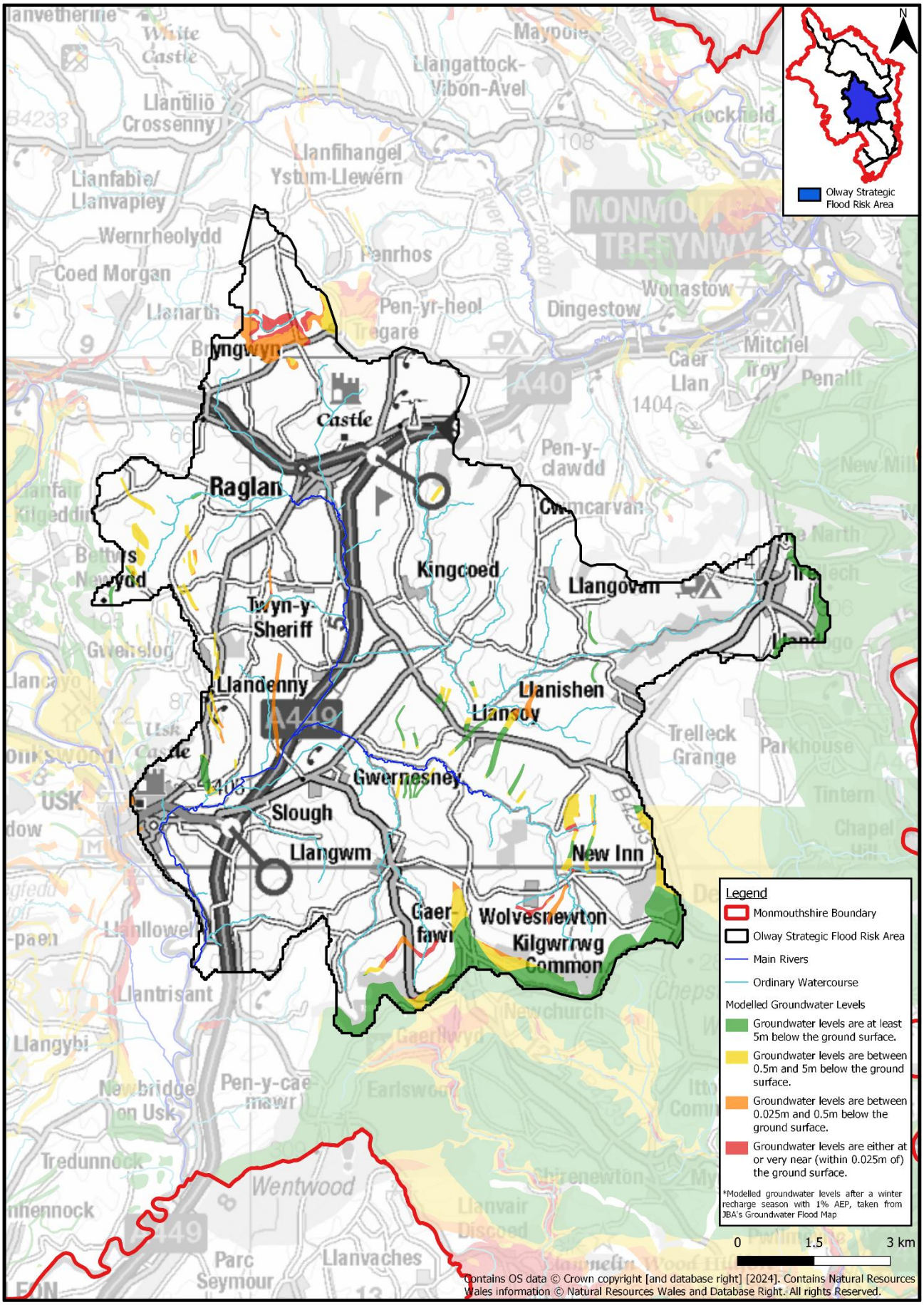
The Olway SFRA has a bedrock geology that is almost entirely mudstone, siltstone and sandstone.

There are three variations of superficial deposits within the Olway SFRA. Diamicton (predominantly clay) has a presence towards the north of the SFRA, around Raglan. A small area of glacial sand and gravel is present around Tregare, in the north of the SFRA and spans into the Trothy SFRA. A clay, silt and sand deposit (Alluvium) runs through the centre of the Olway SFRA, associated with the Olway itself.

In a small part of the north of the Olway SFRA, around Tregare, modelled groundwater levels in the 1% AEP are high, ranging between 0.025 and 0.5 metres below ground level. This is the part of the SFRA which has superficial deposits of sand and gravel.

Modelled groundwater levels in the 1% AEP are shown in Figure 21. Transparent areas on the mapping indicate a negligible risk of groundwater emergence due to the nature of the local geological deposits and depth of ground water below ground level.

Figure 21. Olway SFRA – Flood Risk from Groundwater



7.6 Flood Action Plan

The actions proposed within the Olway SFRA Flood Action Plan are listed in Table 16 below.

Table 16. Olway SFRA Action Plan

SFRA Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Olway 1	**Flood Risk Assessment** Undertake a catchment wide assessment of flood risk to identify properties, businesses and infrastructure at greatest risk of flooding from local sources.	Olway SFRA	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Commenced
Olway 2	**Old Monmouth Road, Raglan** Review culvert capacity and consider options to improve conveyance of the unnamed watercourse crossing the C28.9.	Raglan	Protection	14 & 15	Medium Term	Low	Revenue	Not Started
Olway 3	**Chepstow Road, Usk Catchment Assessment** Undertake a catchment assessment and record details of all surface water and land drainage features discharging into the Olway Brook at Chepstow Road, Usk on the Highways and Flood Management Asset Database.	Usk	Preparedness, Protection	11, 12 & 14	Short Term	Low	Revenue	Commenced
Olway 4	**Natural Flood Management** Develop previously identified Natural Flood Management options across the catchment of the Barton Brook, Raglan and discuss with landowners.	Raglan	Preparedness, Protection	8, 10 & 15	Long Term	Medium	Capital	Not Started
Olway 5	**Natural Flood Management** Develop previously identified Natural Flood Management options across the catchment of the Pill Brook east of Llangwm and discuss with landowners.	Llangwm	Preparedness, Protection	8, 10 & 15	Long Term	Medium	Capital	Not Started
Olway 6	**Natural Flood Management** Develop previously identified Natural Flood Management options across the catchment of the Pontyrhydan Brook east of Raglan and discuss with landowners.	Raglan	Preparedness, Protection	8, 10 & 15	Long Term	Medium	Capital	Not Started

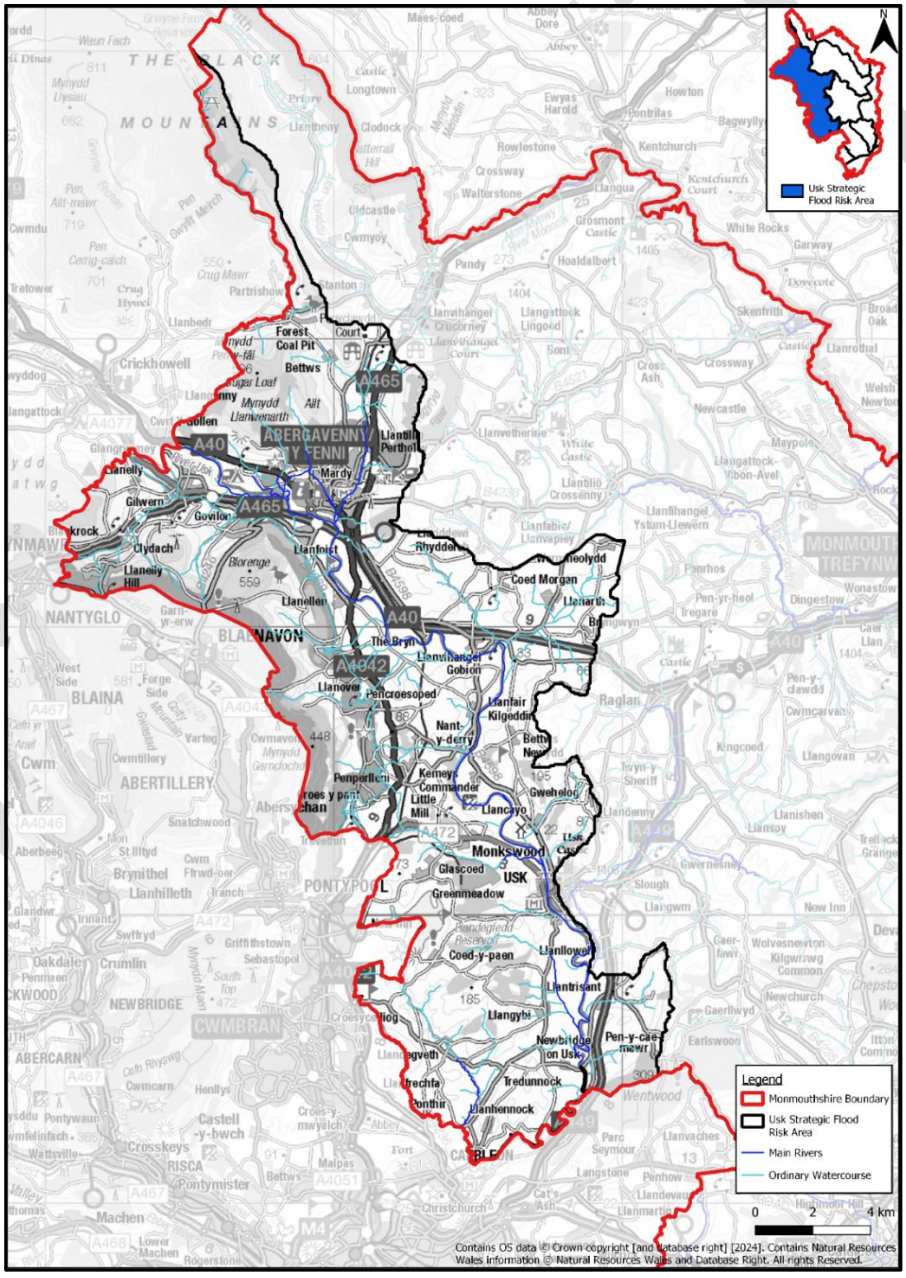
8 Usk SFRA Flood Action Plan

This Action Plan describes the nature, extent and location of flood risk within the Usk Strategic Flood Risk Area (SFRA) with an emphasis on local sources of flood risk i.e. surface water, small watercourses and ground water. It also sets out the actions MCC will undertake, or are already in the process of undertaking, to manage flood risk from local sources.

8.1 Usk SFRA Description

The Usk SFRA is located in the western region of Monmouthshire and borders the Honddu, Trothy, Olway and Nedern Brook & West Pill Reen SFRA's to the east as shown in Figure 22. The SFRA covers approximately 274km² and is the largest in the county.

Figure 22. Usk Strategic Flood Risk Area



Within the Usk SFRA there are many small villages and towns. The main settlements include Abergavenny in the north and Usk in the southeast. The landscape exhibits a mixture of land uses; predominantly agriculture (mainly pastoral and some arable), but also parkland and woodlands.

A network of small watercourses flow across the Usk SFRA before entering the River Usk, which is a designated main river, that flows through the centre of the SFRA catchment, predominantly in a north to south direction. The River Usk enters the Newport City Council area at Caerleon and ultimately flows into the Severn Estuary at Newport. The River Usk is a designated main river for which NRW are the Risk Management Authority, part of their remit is to maintain the flood defences at Usk Town and Llanllowell. At Abergavenny, the Afon Cibi and the Gavenny River run through the town as do a small number of largely unnamed culverted watercourses. To the west, the River Clydach and Nant Dyar converge at Clydach, before flowing northeast adjacent to the A465, where the River Clydach passes beneath the Monmouthshire and Brecon Canal and through Gilwern to the River Usk. Further south, unnamed ordinary watercourses at Llanfihangel Gobion, Llanvair Kilgeddin, Usk and Llanbadoc have contributed to localised flooding events in the past.

Topography in the Usk SFRA varies, with areas of large floodplain along the Usk Valley, to rolling countryside and steeper hills to the north around Abergavenny, where the Black Mountains and Bannau Brycheiniog National Park cross into Monmouthshire.

The Abergavenny CaRR community is a designated Flood Risk Area as identified in the Severn Preliminary Flood Risk Assessment, produced by NRW and the Environment Agency in 2018. Designated Flood Risk Areas required the production of a Flood Risk Management Plan (FRMP), as per the Flood Risk Regulations 2009 (FRR). This Flood Action Plan is intended to meet these requirements.

8.2 History of Flooding

LLFA records of historic flooding within the Usk SFRA show the most significant events are mainly related to the River Usk. These events have affected numerous properties, businesses and local infrastructure in areas such as Llanwenarth, Abergavenny, Llanfihangel Gobion, Usk and Llanbadoc. Details of these events have been recorded in published Section 19 Flood Reports available on MCC's website.

Areas at high risk from local sources of flooding and those that have experienced flooding in recent years are spread across the SFRA. In the north, properties and infrastructure in Llanelly Hill, Govilon, Llanwenarth and Abergavenny have been impacted by surface water runoff from higher ground and blockages in watercourses and culverts resulting in out of bank flows. LLFA records also show properties have been affected by such local sources of flooding at Llanellen, Llanover, The Bryn, Penperlleni, Llanfihangel Gobion, Pant-y-goitre, Llanfair Kilgeddin, Little Mill and Usk.

At Usk and Llanbadoc, the River Usk can have a significant influence on smaller ordinary watercourses and surface water drainage systems, by preventing these from discharging during times of flood. This has resulted in multiple residential properties and businesses being affected in areas such as Llanbadoc, Woodside, Abergavenny Road and Porthycarne Gate. Properties in these areas have benefitted from property flood resilience schemes delivered in 2021-2023 by MCC, through Welsh Government grant funding.

Also in Usk in times of flood, out of bank flows from the Olway Brook, itself a designated main river, can affect Chepstow Road and surrounding properties, some of which are defended by an NRW embankment at the rear of Black Barn Lane. These out of bank flows can enter a network of small

ditches and an ordinary watercourse, in fields to the rear of Usk Prison. This watercourse, known locally as The Black Ditch, which is said to have been the medieval town boundary ditch, can become flood locked at the point it discharges to the River Usk adjacent to Usk Athletic Club. This results in flooding to areas such as the lower end of Mill Street and Maryport Street, as well as the Athletic Club grounds.

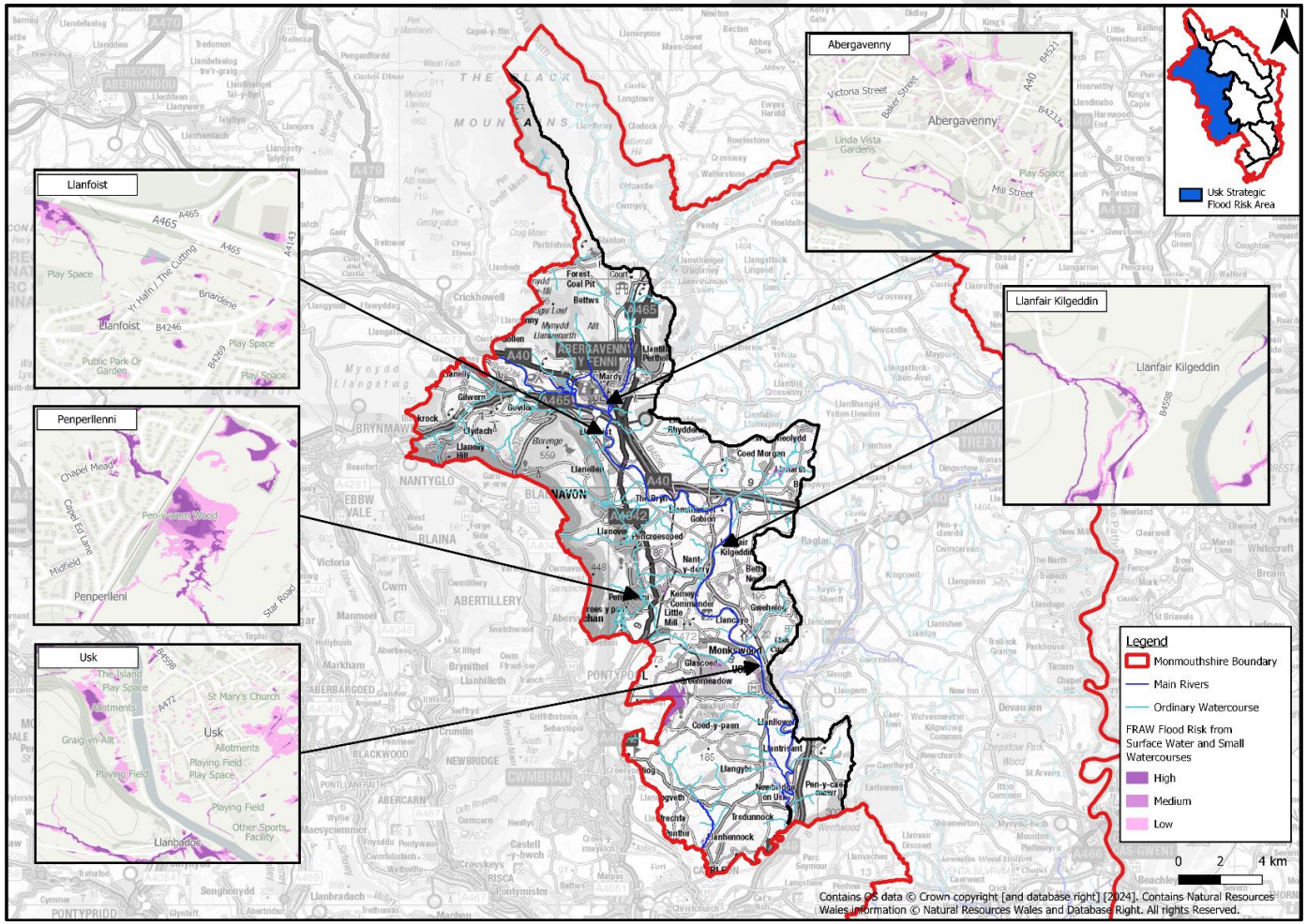
Villages such as Llanbadoc, Llanllowell and Llantrisant are also at high risk of flooding from local sources. Properties and infrastructure have been affected in the past from localised flood events resulting in surface water runoff and watercourses breaking their banks. Properties in each of the aforementioned villages have also benefited from property flood resilience schemes delivered by MCC through Welsh Government grant funding.

It should be noted the above is not intended to be an exhaustive list and doesn't cover more regular minor instances of flooding that can occur.

8.3 Flood Risk from Surface Water & Small Watercourses (Pluvial)

Flood risk from surface water and small watercourses within the Usk SFRA can be found on NRW's Flood Risk Assessment Wales (FRAW) map. Small watercourses are defined as those ordinary watercourses with a catchment of <3km². The main areas at risk are highlighted in Figure 23 below.

Figure 23. Usk SFRA FRAW Map – Surface Water & Small Watercourses (Pluvial)



Using the Communities at Risk Register (CaRR), an assessment of flood risk from surface water and small watercourses has been undertaken. The CaRR's *"Addresses at Risk"* GIS layer has been used to assess Residential, Non-Residential Properties and Key Services at risk.

As shown in Table 17, 125 residential properties are shown to be at high risk in the Usk SFRA. These properties are largely found in the north of the SFRA in Abergavenny and Llanelly Hill. This is partly due to the large areas of impermeable surfaces across the urban extent increasing rainfall runoff and causing a rapid response to rainfall but is largely due to these urban areas being where flood risk receptors are located. Further to the south, Penperlleni and Llanfair Kilgeddin also contain several properties at high risk of surface water flooding.

Properties at medium and low risk of flooding are mainly located in urban areas of Llanelly Hill, Abergavenny, Usk and Penperlleni. In total there are 82 residential properties at medium risk and 450 at low risk.

Non-residential properties and Key Services at risk of surface water flooding are largely found in main settlements of Abergavenny and Usk.

Minor sections of trunk roads and main line railway are at high risk of surface water flooding; this includes the main railway line between Abergavenny and Pontypool. Small areas of the A40 and the A4042 are also at high risk of flooding from surface water and small watercourses.

The results of the assessment of flood risk from surface water and small watercourses is shown in Table 17 below.

Table 17. Usk SFRA – Flood Risk Counts from Surface Water and Small Watercourses (Pluvial)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	125	82	450
Non-Residential Properties at risk of flooding (n)	17	22	80
Key Services at risk of flooding (n)	2	4	9
Listed Buildings (n)	7	2	7
Infrastructure (km)			
Primary/Trunk Roads (km)	1	0.7	3.5
Main Line Railways (km)	1	0	1.7
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	90.8	32.6	135.4
Ancient Woodland	29.7	8.7	27.7
Country Parks	0.9	0.3	1.4
Local Nature Reserves (LNR)	0.1	0.5	1.3
National Nature Reserves (NNR)	1.1	0.6	1.8
Ramsar Sites	0	0	0
Registered Parks and Gardens	17.1	4.3	16.5
Scheduled Ancient Monuments (SAM)	2.6	0.4	1.3
Sites of Interest for Nature Conservation (SINC)	8.0	2.2	8.9
Sites of Special Scientific Interest (SSSI)	16.3	5.2	41.8
Special Areas of Conservation (SAC)	2.8	1.3	5.0
Special Protection Areas (SPA)	0	0	0

8.4 Flood Risk from Rivers (Fluvial)

Using the Communities at Risk Register (CaRR) and NRW's Flood Risk Assessment Wales (FRAW) map, a high-level assessment of fluvial flood risk has been undertaken.

The Fluvial dataset has been considered within this Local Strategy as it contains detail on flood risk from larger ordinary watercourses which affect many areas within Monmouthshire. Main river flooding is also included within the dataset, however this falls outside of the scope of this Local Strategy. The high-level assessment has included the approximate separation of areas at risk from either ordinary watercourses or main rivers, the results of which are shown in Table 18.

Locations at risk from other non-local sources of flooding, in this case main river flooding, have been included in brackets in Table 18 for reference.

Figure 24. Usk SFRA FRAW Map – Rivers (Fluvial)

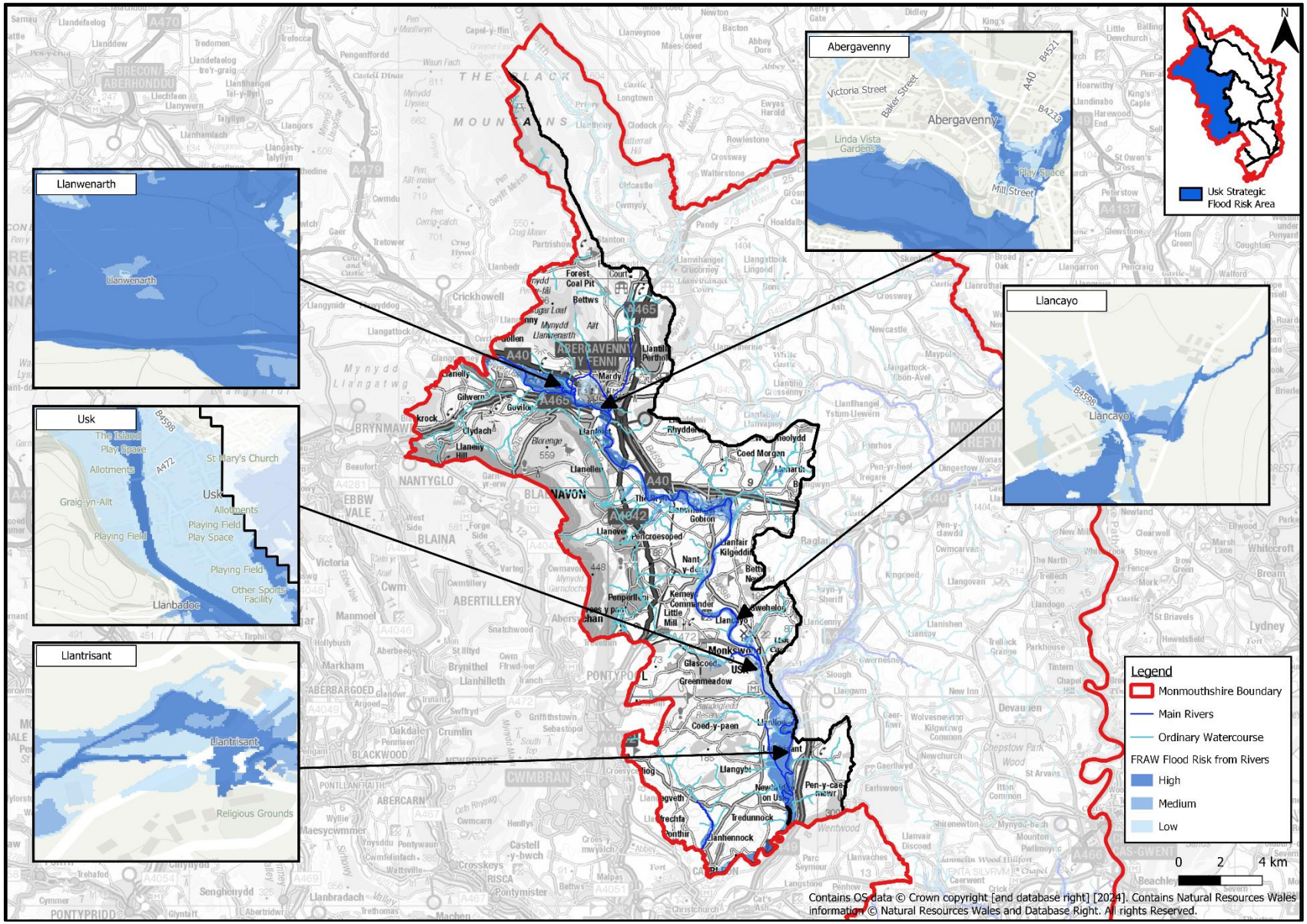


Table 18. Usk SFRA – Flood Risk Counts from Rivers (Fluvial) (Main river counts in brackets)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	14 (138)	9 (156)	44 (491)
Non-Residential Properties at risk of flooding (n)	7 (12)	1 (31)	3 (118)
Key Services at risk of flooding (n)	2 (6)	0 (4)	1 (19)
Listed Buildings (n)	15 (21)	2 (15)	21 (174)
Infrastructure (km)			
Primary/Trunk Roads (km)	0.3 (0.7)	0.4 (0.3)	0.5 (3.5)
Main Line Railways (km)	0.1 (0.1)	0.1 (0)	0.1 (0)
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	107.6 (751.2)	29.4 (138.2)	102.3 (144.5)
Ancient Woodland	30.2 (11.3)	4.1 (2.3)	12.0 (0)
Country Parks	0.1 (0)	1.1 (0)	14.8 (0.8)
Local Nature Reserves (LNR)	0 (0)	0 (0)	0 (0)
National Nature Reserves (NNR)	0.4 (0)	0.1 (0)	0.1 (0)
Ramsar Sites	0 (0)	0 (0)	0 (0)
Registered Parks and Gardens	30.3 (22.2)	5.0 (4.1)	23.4 (3.6)
Scheduled Ancient Monuments (SAM)	0.1 (0.4)	0 (0.2)	0.3 (1.1)
Sites of Interest for Nature Conservation (SINC)	2.5 (33.7)	1.3 (8.4)	1.4 (11.5)
Sites of Special Scientific Interest (SSSI)	9.3 (238.7)	0.6 (1.9)	1.0 (3.3)
Special Areas of Conservation (SAC)	8.7 (238.5)	0.6 (1.9)	0.9 (1.6)
Special Protection Areas (SPA)	0 (0)	0 (0)	0 (0)

8.5 Flood Risk from Groundwater

Flood risk from groundwater has been considered by reference to three datasets. Geological information has been obtained from the British Geological Survey's 1:625,000 scale solid geology and 1:625,000 scale superficial deposits data layers. Modelled groundwater levels after a winter recharge season with 1% AEP have been obtained from JBA's Groundwater Flood Map. Information regarding JBA's Groundwater Flood Map is contained in Chapter 3 of this Strategy.

The majority of the bedrock geology in the Usk SFRA comprises a varied sequence of near horizontally bedded sedimentary rocks with distribution controlled by topography. Older rock is present in the base of the Usk Valley with younger rock exposed on the hills to the west. The sequence generally comprises mudstones in the valley base, up into interbedded sandstones and mudstones, a conglomerate layer, a sequence of limestones, a sequence of mudstones, and, on the top of the western hills, a sequence of sandstones and mudstones with interbedded coal seams.

As a complication to the general horizontal sequence described above, the Usk inlier (located between Clytha and Llandegfedd) comprises a more deformed, and in places steeply dipping, sequence of older rocks (mudstones, siltstones, limestones and sandstone).

Much of the river valley of the Usk is lined by superficial deposits comprising glaciofluvial sand and gravel, river terrace deposits (sand and gravel) and alluvium of the modern river (a sequence of clay, silt, sand and gravel). Alluvial fan deposits (sand and gravel) associated with steeply sloping watercourses flowing from the surrounding hills are mapped in a number of locations, including Gilwern, Llanwenarth, Cantref and a rural location between Llanellen and Llanover. Away from the mountains and the base of the river valley, much of the Usk SFRA is covered by a layer of glacial till (generally sandy and gravelly clay).

A significant area of artificial deposits is recorded around Llanelly Hill in the north-west of the Usk SFRA. The majority of this represents disused coal spoil tips.

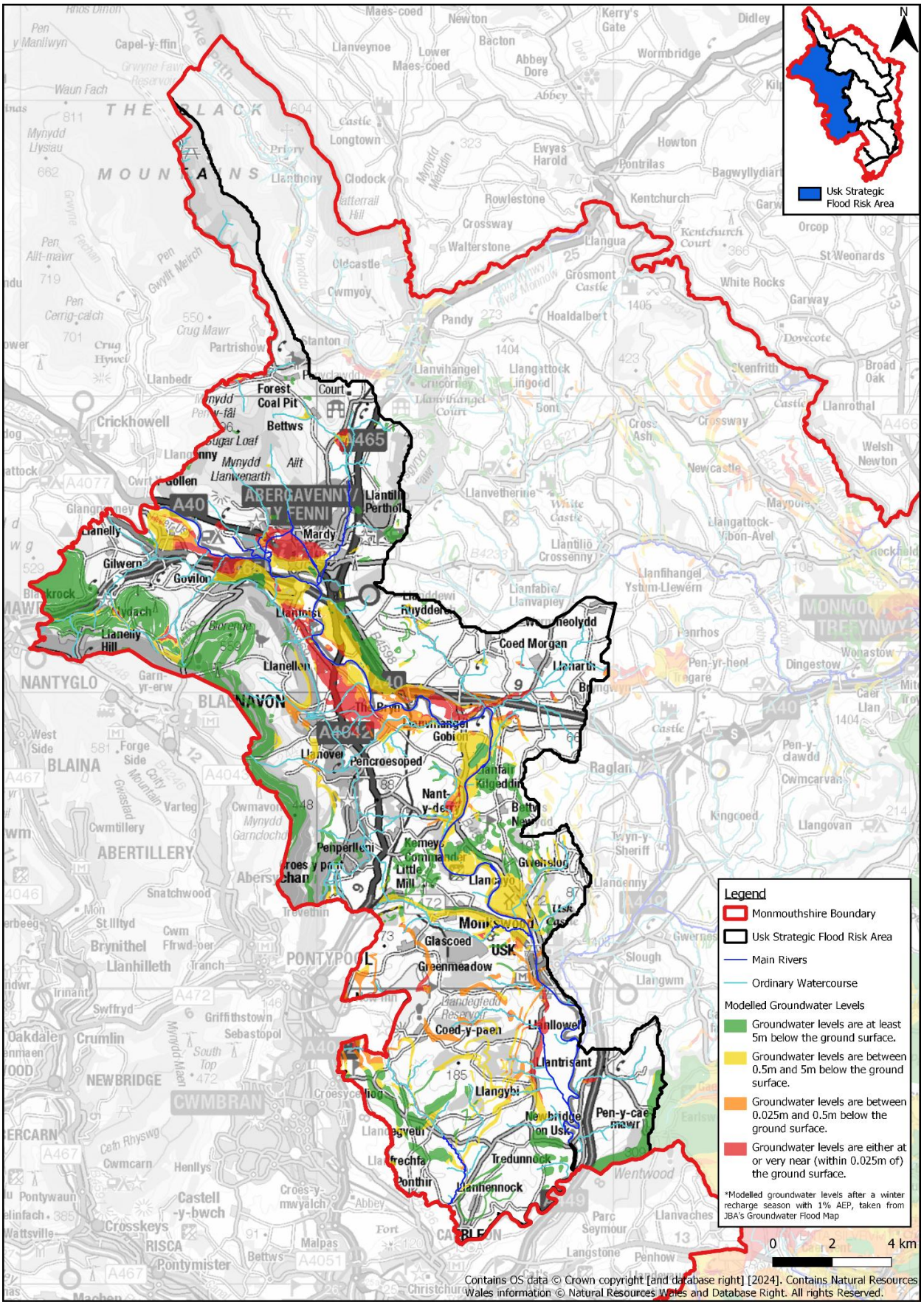
Across much of the Usk SFRA modelled groundwater levels in the 1% AEP are at least 5 metres below the ground surface.

Modelled groundwater levels in the 1% AEP at or very near (within 0.025m) the ground surface are mapped in some rural areas, generally associated with the flood plain of the River Usk, but also in the Cantref area of Abergavenny, where they appear to be associated with Alluvial Fan Deposits relating to the Afon Cibi and Nant Iago.

Areas of modelled groundwater levels in the 1% AEP between 0.5m and 5m below the ground surface are mapped in the northern part of Gilwern, in the southern part of Abergavenny, in the southern parts of Govilon and across much of Llanfoist.

Modelled groundwater levels in the 1% AEP are shown in Figure 25. Transparent areas on the mapping indicate a negligible risk of groundwater emergence due to the nature of the local geological deposits and depth of ground water below ground level.

Figure 25. Usk SFRA – Flood Risk from Groundwater



8.6 Flood Action Plan

The actions proposed within the Usk SFRA Flood Action Plan are listed in Table 19 below.

Table 19. Usk SFRA Action Plan

SFRA Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Usk 1	**Flood Risk Assessment** Undertake a catchment wide assessment of flood risk to identify properties, businesses and infrastructure at greatest risk of flooding from local sources.	Usk SFRA	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Commenced
Usk 2	**Woodside, Llanbadoc, Usk Flood Alleviation Scheme** Undertake detailed design and produce a Full Business Case for the preferred option identified in the completed Outline Business Case for managing flood risk from local sources.	Usk	Protection	15	Short Term	High	Capital	Commenced
Usk 3	**Woodside, Llanbadoc, Usk Flood Alleviation Scheme** Construction of the preferred option following completion of the Full Business Case and Detailed Design.	Usk	Protection	15	Medium Term	Very High	Capital	Commenced
Usk 4	**Usk Town Bridge** Undertake a structural assessment of Usk Town Bridge parapet wall opposite Woodside Cottages.	Usk	Protection	15	Short Term	Low	Revenue	Not Started
Usk 5	**Abergavenny Flood Risk Area** Undertake an assessment of flood risk within the Flood Risk Area by Natural Resources Wales Preliminary Flood Risk Assessment.	Abergavenny	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Not Started
Usk 6	**Llanwenarth Community Flood Plan** Support the local community in developing a community and/or individual flood plans.	Llanwenarth	Preparedness	4 & 7	Short Term	Low	Revenue	Not Started
Usk 7	**Abergavenny Culverted Watercourses** Investigate culverted watercourses through Abergavenny town, to identify and record location, construction detail, structural condition, ownership and maintenance responsibility and record on the	Abergavenny	Preparedness	10, 11, 12 & 14	Long Term	Medium	Revenue	Not Started

	Highways and Flood Management Asset Database.							
Usk 8	**Monmouthshire and Brecon Canal** Consider undertaking an assessment of overtopping and breach risk from the Monmouthshire and Brecon Canal.	Usk SFRA	Preparedness, Protection	4, 5, 10, 11, & 14	Long Term	Medium	Revenue	Not Started
Usk 9	**Road Closures** Consider requirement for signage and/or physical barriers to close local roads during significant flooding, including the R64/R41 Llanarth junction, B4598 at Usk and Llanfihangel Gobion and the R110 Newbridge on Usk.	Llanfihangel Gobion	Preparedness, Protection	12 & 15	Short Term	Low	Revenue	Commenced
Usk 11	**Nant Iago, Llanwenarth** Assess options to reduce flood risk from the Nant Iago upstream of the A40 crossing.	Llanwenarth	Protection	15	Short Term	Low	Capital	Commenced
Usk 12	**Llanfair Kilgeddin** Review previously identified options to reduce flood risk from local sources and consider viability of implementing a flood scheme.	Llanfair Kilgeddin	Protection	15	Long Term	Medium	Capital	Commenced
Usk 13	**Natural Flood Management** Develop previously identified Natural Flood Management options across the catchment of the unnamed ordinary watercourse that runs along the western edge of Llanfair Kilgeddin.	Llanfair Kilgeddin	Preparedness, Protection	8, 10 & 15	Long Term	Medium	Capital	Not Started
Usk 14	**Natural Flood Management** Develop previously identified Natural Flood Management options across the Cibi Brook, Abergavenny catchment and discuss with landowners.	Abergavenny	Preparedness, Protection	8, 10 & 15	Long Term	Medium	Capital	Not Started
Usk 15	**Natural Flood Management** Develop previously identified Natural Flood Management options across the River Gavenny, Abergavenny catchment and discuss with landowners.	Abergavenny	Preparedness, Protection	8, 10 & 15	Long Term	Medium	Capital	Not Started
Usk 16	**Natural Flood Management** Develop previously identified Natural Flood Management options across the catchment of the unnamed ordinary watercourse upstream and to the west of Llanbadoc.	Llanbadoc	Preparedness, Protection	8, 10 & 15	Long Term	Medium	Capital	Not Started

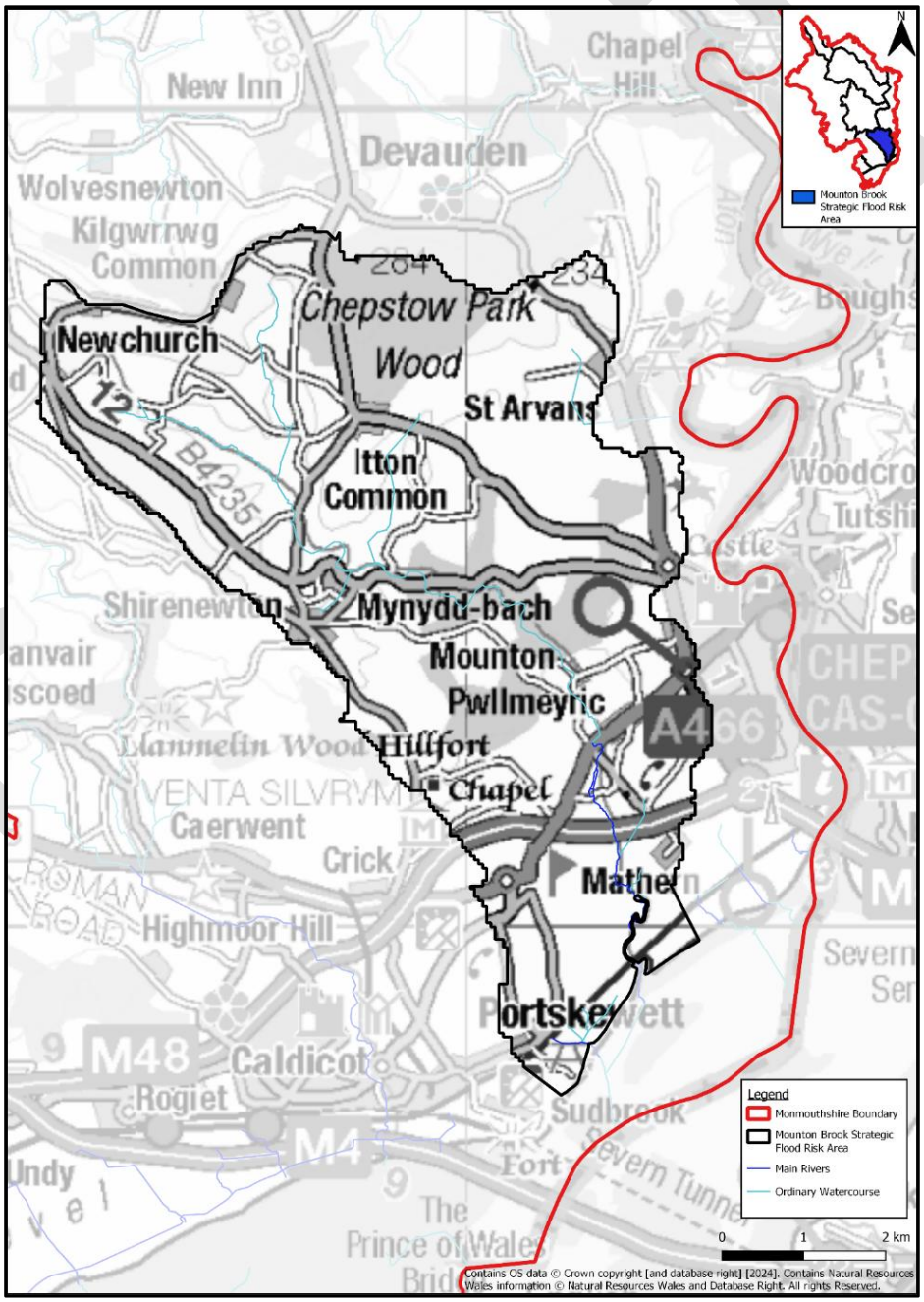
9 Mounton Brook SFRA Flood Action Plan

This Action Plan describes the nature, extent and location of flood risk within the Mounton Brook Strategic Flood Risk Area (SFRA) with an emphasis on local sources of flood risk i.e. surface water, small watercourses and ground water. It also sets out the actions MCC will undertake, or are already in the process of undertaking, to manage flood risk from local sources.

9.1 Mounton Brook SFRA Description

The Mounton Brook SFRA covers approximately 44km² and is located in the southeastern region of Monmouthshire, bordering the Wye, Olway and Nedern Brook & West Pill Reen SFRAs as shown in Figure 26.

Figure 26: Mounton Brook Strategic Flood Risk Area



The main settlements within the Mounton Brook SFRA include Itton, Shirenewton, Mynydd-bach, Pwllmeyric and Mathern. Western edges of St Arvans and Chepstow also fall within this SFRA boundary. Some significant historic buildings include Moynes Court and Mathern Palace, which are located near Mathern. At the southern end, the M48, A48 and the Gloucester to South Wales railway cross the SFRA.

The Mounton Brook flows in a southerly direction along the spine of the SFRA and becomes a designated main river south of the A48 at Pwllmeyric. The brook then continues in a southerly direction where it outfalls into the Severn Estuary.

Topography of the SFRA is relatively low lying in the south, with the largest elevations in the north. The southern edge of this SFRA borders the Severn Estuary where low lying areas are defended by NRW maintained coastal defences, in the form of earth embankments, that stretch for a length of approximately 2.6km. The Mounton Brook and other smaller ordinary watercourses south of the M4 fall within the Gwent Internal Drainage District which is managed by NRW (formerly the Caldicot and Wentlooge Internal Drainage Board). This region also has areas that have been designated Sites of Special Scientific Interest and Special Areas of Conservation.

9.2 History of Flooding

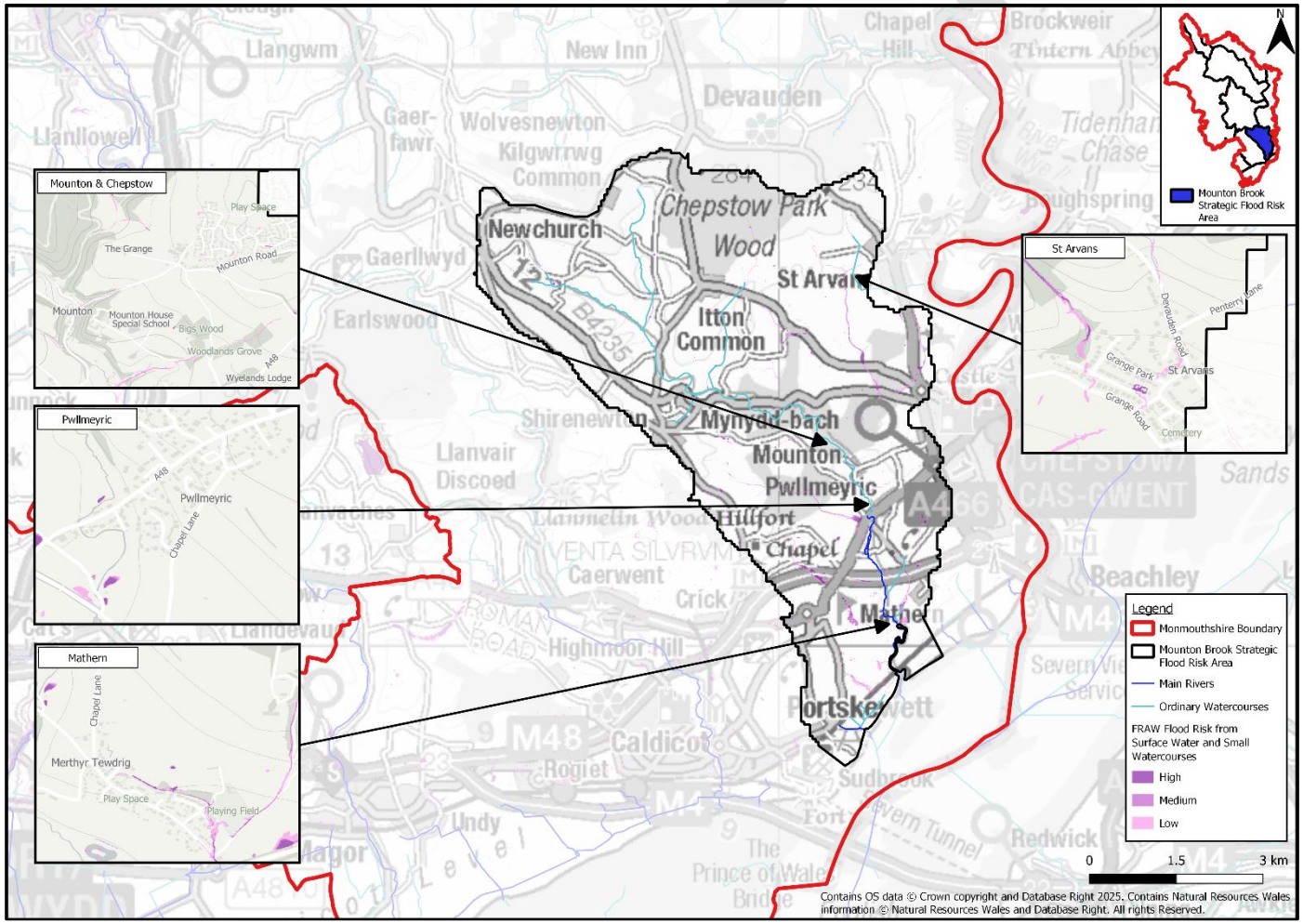
LLFA records of historic flood events within the Mounton Brook SFRA are mainly associated with properties located immediately adjacent to the Mounton Brook, between Mynydd Bach and Mounton, with only a small number of reports of internal property flooding. Isolated issues with surface water flooding to land and the local road network have also been reported across the SFRA.

Given the rural nature of the catchment, reports of blockages to local watercourses, which could increase flood risk, are not uncommon. These are dealt with by MCC through powers under the Land Drainage Act 1991, in areas where MCC are the Land Drainage Authority. Natural Resources Wales are the Land Drainage Authority for areas falling within the Gwent Internal Drainage District, which covers areas in the south of the SFRA.

9.3 Flood Risk from Surface Water & Small Watercourses (Pluvial)

Flood risk from surface water and small watercourses within the Mounton Brook SFRA can be found on NRW's Flood Risk Assessment Wales (FRAW) map. Small watercourses are defined as those ordinary watercourses with a catchment of <3km². The main areas at risk are highlighted in Figure 27 below.

Figure 27: Mounton Brook SFRA FRAW Map – Surface Water & Small Watercourses (Pluvial)



Using the Communities at Risk Register (CaRR), an assessment of flood risk from surface water and small watercourses has been undertaken. The CaRR's *"Addresses at Risk"* GIS layer has been used to assess Residential, Non-Residential Properties and Key Services at risk.

In total 8 residential properties are shown to be at high risk. The majority of these properties are located near to St Arvans, Mathern and along the eastern SFRA border close to Chepstow.

Residential properties at medium and low risk of flooding are also generally located in the east. In total there are 5 residential properties at medium risk and 42 at low risk.

A very small area of Primary/Trunk roads are shown to be at high risk of surface water flooding which include sections of the M48 motorway that passes through the south of the SFRA.

The results of the assessment of flood risk from surface water and small watercourses is shown in Table 20 below.

Table 20. Mounton Brook SFRA – Flood Risk Counts from Surface Water and Small Watercourses (Pluvial)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	8	5	42
Non-Residential Properties at risk of flooding (n)	0	0	2
Key Services at risk of flooding (n)	0	0	2
Listed Buildings (n)	1	2	0
Infrastructure (km)			
Primary/Trunk Roads (km)	0.1	0.1	0.2
Main Line Railways (km)	0	0	0
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	8.6	6.1	24.4
Ancient Woodland	1.6	1.7	5.8
Country Parks	0	0	0
Local Nature Reserves (LNR)	0	0	0
National Nature Reserves (NNR)	0	0	0
Ramsar Sites	0	0	0
Registered Parks and Gardens	2.3	3.2	6.6
Scheduled Ancient Monuments (SAM)	0	0	0
Sites of Interest for Nature Conservation (SINC)	0.7	0.5	2.2
Sites of Special Scientific Interest (SSSI)	0.1	0	0.1
Special Areas of Conservation (SAC)	0	0	0
Special Protection Areas (SPA)	0	0	0

9.4 Flood Risk from Rivers (Fluvial)

Using the Communities at Risk Register (CaRR) and NRW's Flood Risk Assessment Wales (FRAW) map, a high-level assessment of fluvial flood risk has been undertaken.

The Fluvial dataset has been considered within this Local Strategy as it contains detail on flood risk from larger ordinary watercourses which affect many areas within Monmouthshire. Main river flooding is also included within the dataset, however this falls outside of the scope of this Local Strategy. The high-level assessment has included the approximate separation of areas at risk from either ordinary watercourses or main rivers, the results of which are shown in Table 21.

Locations at risk from other non-local sources of flooding, in this case main river and tidal flooding, have been included in brackets in Table 21 for reference.

Figure 28. Mounton Brook SFRA FRAW Map – Rivers (Fluvial)

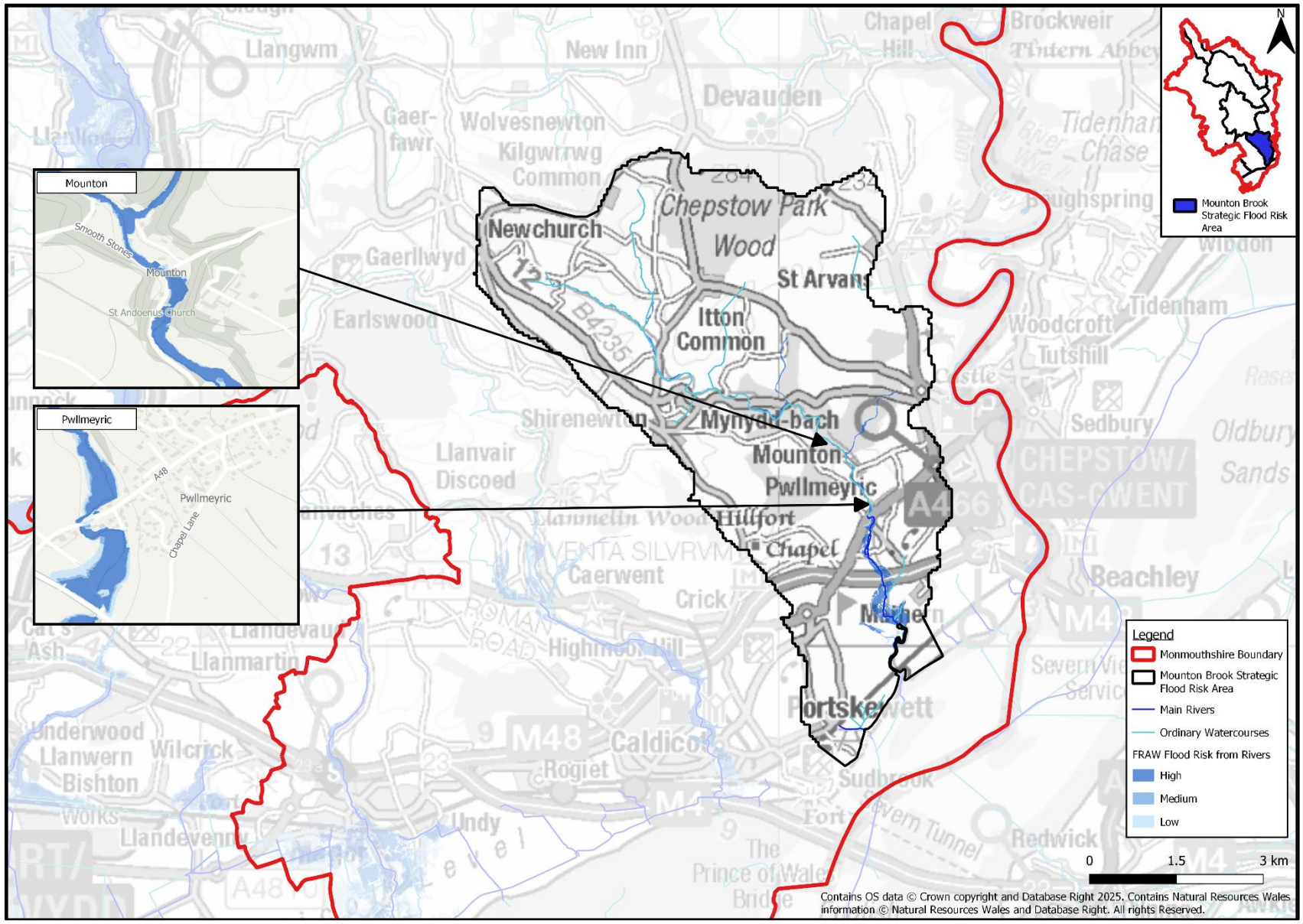


Table 21. Mounton Brook SFRA – Flood Risk Counts from Rivers (Fluvial) (Main river counts in brackets)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	2 (1)	0 (0)	5 (0)
Non-Residential Properties at risk of flooding (n)	0 (0)	0 (0)	0 (0)
Key Services at risk of flooding (n)	0 (0)	0 (0)	0 (0)
Listed Buildings (n)	0 (0)	0 (0)	0 (0)
Infrastructure (km)			
Primary/Trunk Roads (km)	0 (0)	0 (0)	0 (0)
Main Line Railways (km)	0 (0)	0 (0)	0 (0)
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	5.1 (29.3)	1.1 (4.6)	1.6 (3.9)
Ancient Woodland	5.7 (0.5)	0.8 (0.1)	1.2 (0)
Country Parks	0 (0)	0 (0)	0 (0)
Local Nature Reserves (LNR)	0 (0)	0 (0)	0 (0)
National Nature Reserves (NNR)	0 (0)	0 (0)	0 (0)
Ramsar Sites	0 (0)	0 (0)	0 (0)
Registered Parks and Gardens	7.2 (0.7)	1.4 (0.2)	1.3 (0.2)
Scheduled Ancient Monuments (SAM)	0 (0)	0 (0)	0 (0)
Sites of Interest for Nature Conservation (SINC)	1.3 (0.7)	0.1 (0.1)	0.3 (0.2)
Sites of Special Scientific Interest (SSSI)	2.6 (0)	1.0 (0)	0.8 (0)
Special Areas of Conservation (SAC)	0 (0)	0 (0)	0 (0)
Special Protection Areas (SPA)	0 (0)	0 (0)	0 (0)

9.5 Flood Risk from Groundwater

Flood risk from groundwater has been considered by reference to three datasets. Geological information has been obtained from the British Geological Survey's 1:625,000 scale solid geology and 1:625,000 scale superficial deposits data layers. Modelled groundwater levels after a winter recharge season with 1% AEP have been obtained from JBA's Groundwater Flood Map. Information regarding JBA's Groundwater Flood Map is contained in Chapter 3 of this report.

The predominant bedrock lithology of the Mounton Brook SFRA is limestone with subordinate sandstone and argillaceous rocks. A small area in the north of the SFRA is comprised of sandstone and conglomerate, interbedded. Mudstone, siltstone and sandstone infringe upon a southern portion of the SFRA.

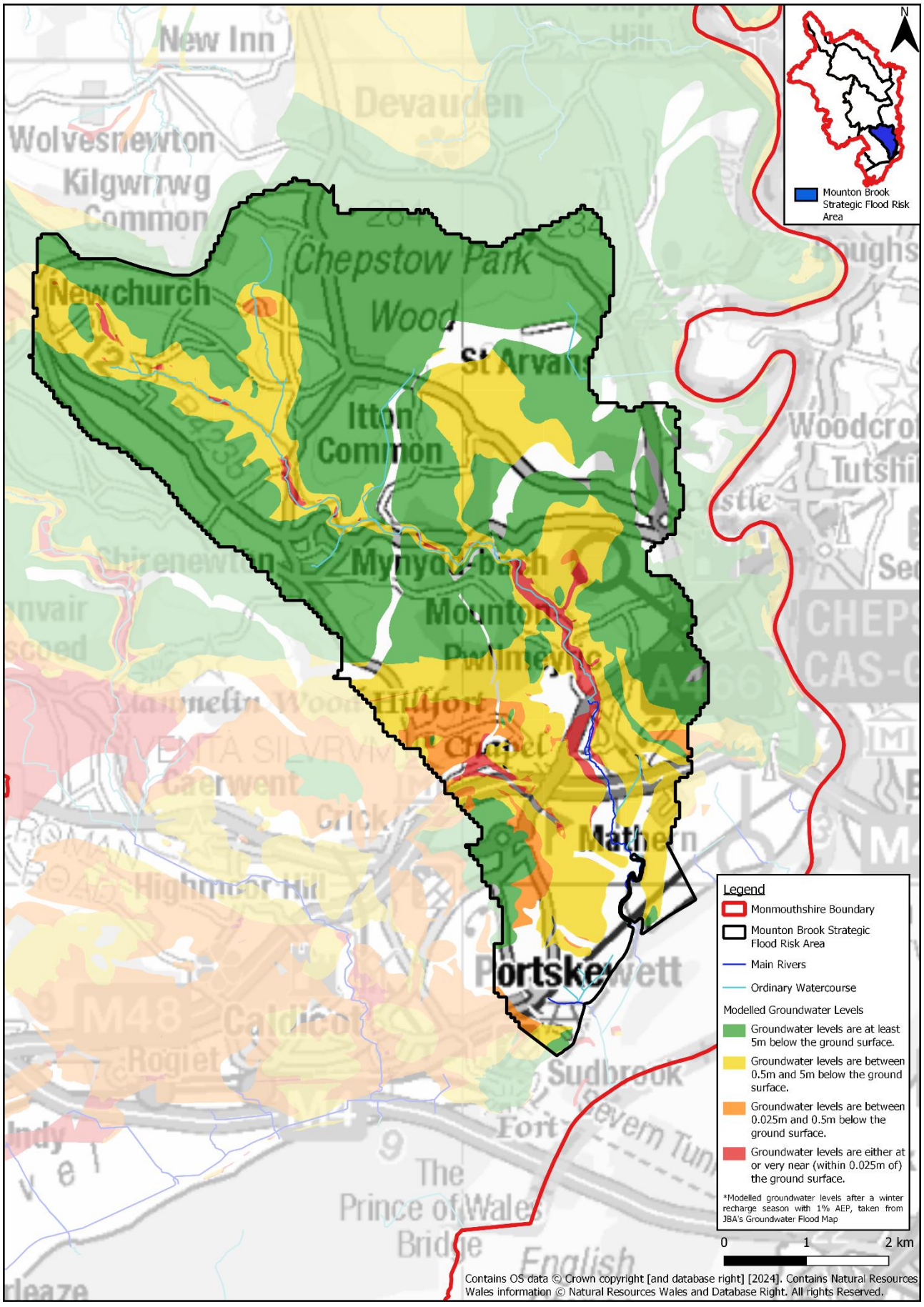
Superficial deposits are present only in the south of the Mounton Brook SFRA. These comprise River Terrace Deposit (sand and gravel) and strips of Alluvium (clay, silt and sand) associated with the Mounton Brook and the Severn Estuary.

The majority of the Mounton Brook SFRA is modelled to have groundwater present. In the northern two-thirds of the SFRA, modelled groundwater levels in the 1% AEP are typically at least 5m below ground level.

A small area of river corridor, along the Mounton Brook to the south of the SFRA, is shown to have modelled groundwater levels in the 1% AEP within 0.025m of ground level. This is where limestone with subordinate sandstone is located, which has influenced groundwater depths. Across the south of the SFRA, modelled groundwater levels in the 1% AEP typically range between 0.5m and 5m below the ground surface.

Modelled groundwater levels in the 1% AEP are shown in Figure 29. Transparent areas on the mapping indicate a negligible risk of groundwater emergence due to the nature of the local geological deposits and depth of ground water below ground level.

Figure 29. Mounton Brook SFRA – Flood Risk from Groundwater



9.6 Flood Action Plan

The actions proposed within the Mounton Brook SFRA Flood Action Plan are listed in Table 22 below.

Table 22. Mounton Brook SFRA Action Plan

SFRA Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Mounton Brook 1	**Flood Risk Assessment** Undertake a catchment wide assessment of flood risk to identify properties, businesses and infrastructure at greatest risk of flooding from local sources.	Mounton Brook SFRA	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Commenced
Mounton Brook 2	**Mounton** Identify and review options to reduce known flood risk from local sources.	Mounton	Preparedness, Protection	8, 9, 10, 14, & 15	Medium Term	Low	Capital	Not Started
Mounton Brook 3	**Mathern** Identify and review options to reduce known flood risk from local sources.	Mathern	Preparedness, Protection	8, 9, 10, 14, & 15	Medium Term	Low	Capital	Not Started

10 Nedern Brook & West Pill Reen SFRA Flood Action Plan

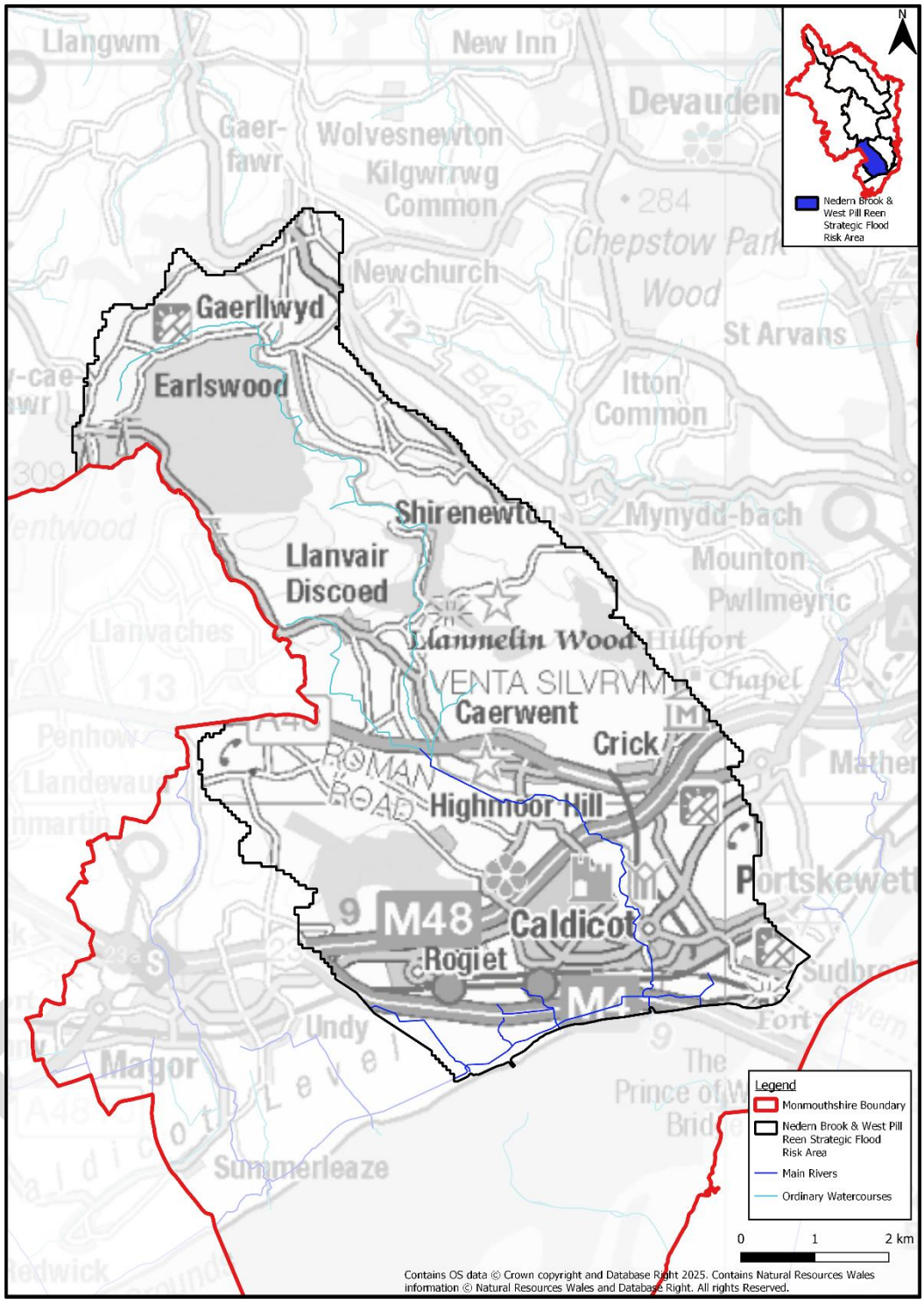
This Action Plan describes the nature, extent and location of flood risk within the Nedern Brook & West Pill Reen Strategic Flood Risk Area (SFRA) with an emphasis on local sources of flood risk i.e. surface water, small watercourses and ground water. It also sets out the actions MCC will undertake, or are already in the process of undertaking, to manage flood risk from local sources.

10.1 Nedern Brook & West Pill Reen SFRA Description

The Nedern Brook & West Pill Reen SFRA is located in the south of Monmouthshire and covers a total area of approximately 55km². Due to the location of the main settlements and the two catchments being comparatively small in area, the Nedern Brook & West Pill Reen catchments have been combined to form one SFRA. The West Pill Reen catchment is located in the south western corner of the SFRA, covering an area of approximately 7.8km², where it drains to the Severn Estuary south of Rogiet.

This SFRA is bordered by the Mounton Brook, Olway, Usk and Mill Reen SFRA's as shown on Figure 30. The southern boundary runs along the Severn Estuary, where the Prince of Wales Bridge connects South Wales to England.

Figure 30. Nedern Brook & West Pill Reen Strategic Flood Risk Area



The main settlements and more urbanised areas can be found in the south, these include Caerwent, Rogiet, Caldicot, Crick and Portskewett. This is also where the major travel infrastructure is located such as the A48, M48, M4 carriageways and the South Wales railway, all of which run in an east to west direction. Further north lies the village of Llanvair Discoed and eastern side of Wentwood forest.

Topography of the SFRA is relatively low lying in the south, with the largest elevations in the north. The southern edge of this SFRA borders the Severn Estuary for a length of 5.3km. Here low-lying areas are defended by stretches of natural high ground and NRW maintained coastal defences, typically in the form of raised embankments.

The Nedern Brook is an NRW designated main river with a catchment upstream of Caldicot of approximately 46km² that is predominately rural in nature. The main flows rise in the Wentwood area northwest of Caldicot. There an ordinary watercourse known as the Castrogi Brook rises and flows southwards with other small tributaries to form the Nedern Brook at Caerwent. Here and south of the A48 the Nedern Brook is a designated main river.

There is a Site of Special Scientific Interest (SSSI) to the northeast of Caldicot known as the Nedern Brook Wetlands. There, a large viaduct carries the M48 motorway over the Nedern Brook and the large lake which forms during winter months. The Nedern Brook continues southwards through Caldicot County Park and the Severn Bridge Industrial Estate before it outfalls to the Severn Estuary immediately downstream of the point it passes below the M4 motorway.

The Nedern Brook experiences low flows in summer months, partly due to the underlying limestone rock and swallow holes in the bed of the brook. The flows in the limestone are understood to feed the Great Spring that affected the construction of the Severn Tunnel, where flows are pumped out at Sudbrook to keep the tunnel dry.

The Gwent Internal Drainage District covers a large area of the southern end of the SFRA, extending northwards along the channel of the Nedern Brook to the M48 motorway. Here, an extensive network of reens drain land reclaimed from the Severn Estuary during Roman times. This network of reens (ordinary watercourses) also includes several reens which have been designated as main rivers, including the West Pill Reen, Ifton Reen, Summerway Reen and Back Ditch.

10.2 History of Flooding

Historic flooding issues within Caldicot have mainly been associated with the Nedern Brook which has caused extensive flooding within the Country Park and Severn Bridge Industrial Estate, most recently during February/March 2020. Although very few residential properties were flooded directly from the Nedern during that event, many more lie within the extreme flood outline. Furthermore, many local surface water drainage systems can become flood locked when the Nedern is in spate, resulting in the backing up of flows into residential areas.

The area of Castle Lea and Jolyons Court, which lies adjacent to the country park, has experienced flooding on numerous occasions, caused by flood water entering an open grill chamber which can then back up and surcharge in the residential street. The detail of this and the wider impacts of the above event in 2020 have been recorded in the “Caldicot Section 19 Flood Report” published on MCC’s website. LLFA records also shown historic flooding in Caldicot at Derry View, Castle Lodge Crescent, Newport Road/Severn View junction.

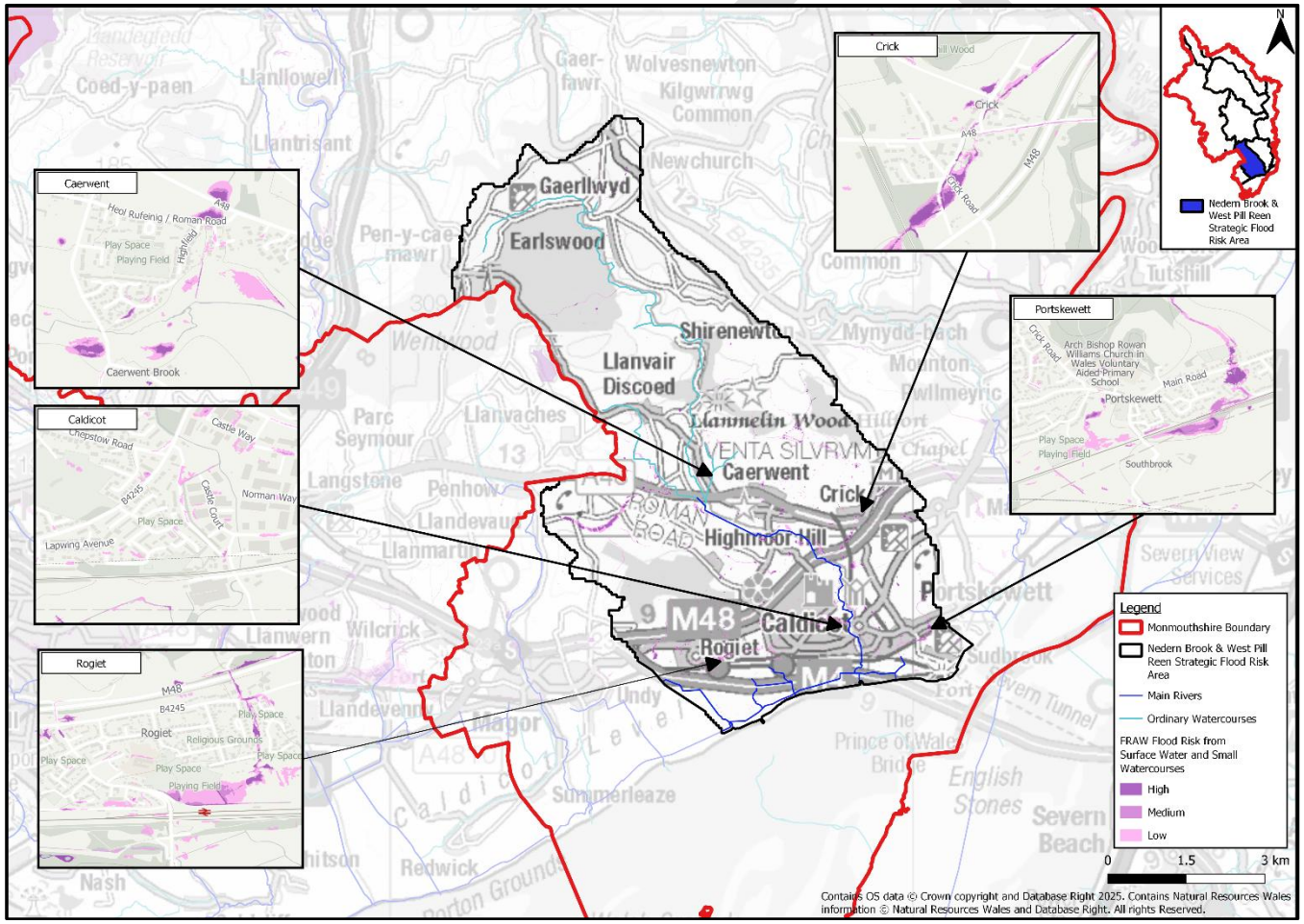
LLFA records show that in Rogiet, surface water flooding has affected local roads and properties at Manor Court, Llanfihangel near Rogiet (Caldicot Road), Minnets Lane, Station Road and Buzzard Close. Further east at Portskewett, overland flows and surface water has affected properties along Main Road, The Close and Treetops.

At Crick, the junction of the B122/A48 has experienced numerous surface water flooding incidents at the low spot which has also affected adjacent properties. This area is shown to be at risk on NRW’s FRAW map from surface water and small watercourses. Historic records also show surface water flooding events at Caerwent, Llanvair Discoed and Earlswood.

10.3 Flood Risk from Surface Water & Small Watercourses (Pluvial)

Flood risk from surface water and small watercourses within the Nedern Brook & West Pill Reen SFRA can be found on NRW's Flood Risk Assessment Wales (FRAW) map. Small watercourses are defined as those ordinary watercourses with a catchment of <3km². The main areas at risk are highlighted in Figure 31 below.

Figure 31. Nedern Brook & West Pill Reen SFRA FRAW Map – Surface Water & Small Watercourses (Pluvial)



Using the Communities at Risk Register (CaRR), an assessment of flood risk from surface water and small watercourses has been undertaken. The CaRR's *"Addresses at Risk"* GIS layer has been used to assess Residential, Non-Residential Properties and Key Services at risk.

In total 25 residential properties are shown to be at high risk. The majority of these properties are located in the southern part of the SFRA in Rogiet, Caldicot and Portskewett. Properties at medium and low risk are also mainly located in the south at Caerwent, Crick, Rogiet, Caldicot and Portskewett.

Non-residential properties and Key Services at risk of surface water flooding are largely found in the main settlements of Caldicot and Rogiet. Most of these are at low to medium risk of surface water and small watercourse flooding.

Minor sections of the main railway line, which links Newport and Chepstow are at medium and low risk of surface water flooding. Very small areas of the A48 west of Crick and the M48 motorway are shown to be at low risk of surface water flooding.

The results of the assessment of flood risk from surface water and small watercourses is shown in Table 23 below.

Table 23. Nedern Brook & West Pill Reen SFRA – Flood Risk Counts from Surface Water and Small Watercourses (Pluvial)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	25	39	371
Non-Residential Properties at risk of flooding (n)	2	2	46
Key Services at risk of flooding (n)	0	2	6
Listed Buildings (n)	0	0	0
Infrastructure (km)			
Primary/Trunk Roads (km)	0	0	0.2
Main Line Railways (km)	0	0.1	0.8
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	15.8	9.9	35.8
Ancient Woodland	0.9	0.6	2.6
Country Parks	0.1	0.2	1.4
Local Nature Reserves (LNR)	0	0	0
National Nature Reserves (NNR)	0	0	0
Ramsar Sites	0	0	0
Registered Parks and Gardens	0	0	0
Scheduled Ancient Monuments (SAM)	0.4	0.3	1
Sites of Interest for Nature Conservation (SINC)	0.6	0.5	2.1
Sites of Special Scientific Interest (SSSI)	0.8	0.6	3.3
Special Areas of Conservation (SAC)	0	0	0
Special Protection Areas (SPA)	0	0	0

10.4 Flood Risk from Rivers (Fluvial)

Using the Communities at Risk Register (CaRR) and NRW's Flood Risk Assessment Wales (FRAW) map, a high-level assessment of fluvial flood risk has been undertaken.

The Fluvial dataset has been considered within this Local Strategy as it contains detail on flood risk from larger ordinary watercourses which affect many areas within Monmouthshire. Main river flooding is also included within the dataset, however this falls outside of the scope of this Local Strategy. The high-level assessment has included the approximate separation of areas at risk from either ordinary watercourses or main rivers, the results of which are shown in Table 24.

Locations at risk from other non-local sources of flooding, in this case main river and tidal flooding, have been included in brackets in Table 24 for reference.

Figure 32. Nedern Brook & West Pill Reen SFRA FRAW Map – Rivers (Fluvial)

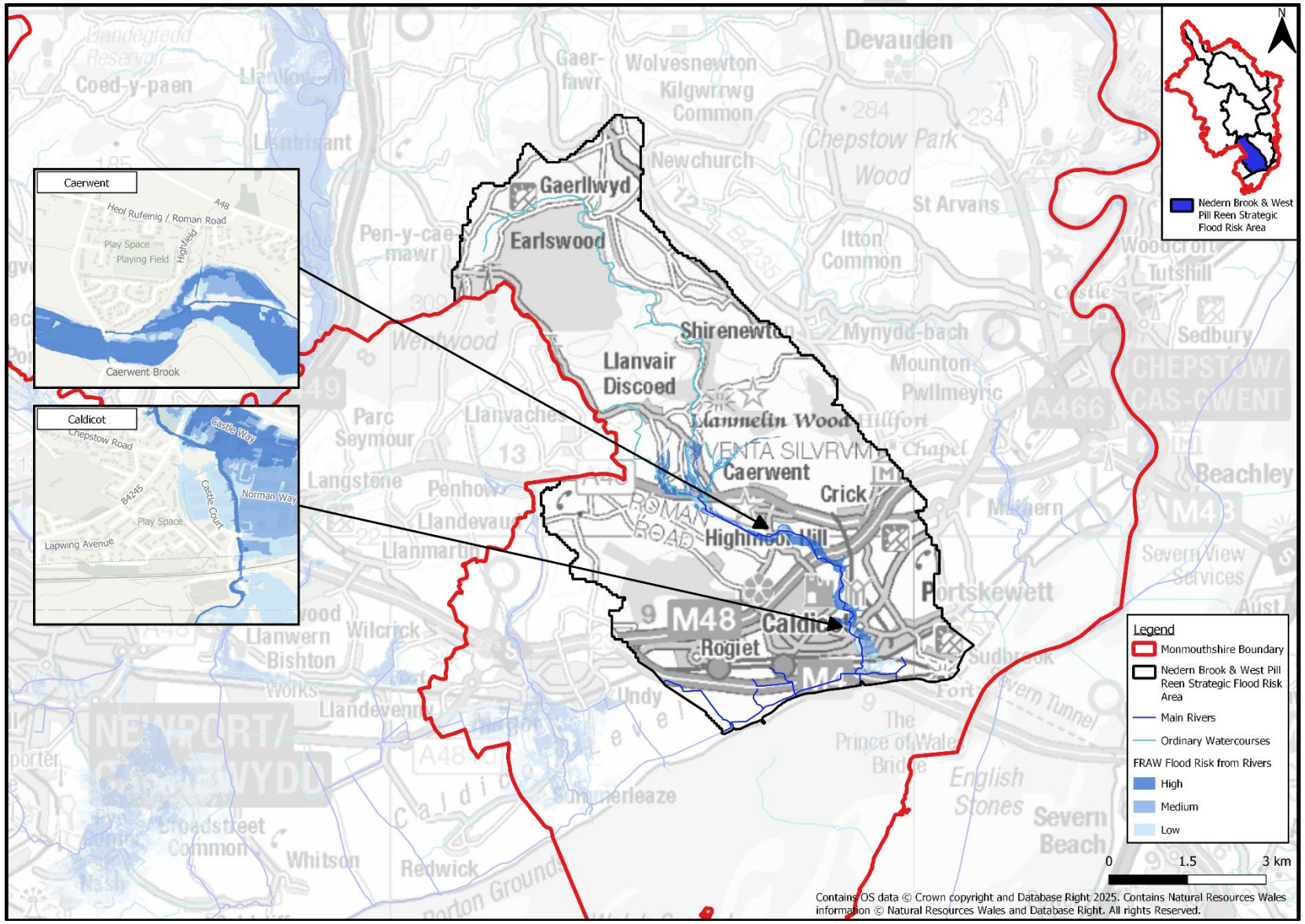


Table 24. Nedern Brook & West Pill Reen SFRA – Flood Risk Counts from Ordinary Watercourses (Fluvial) (Main river counts in brackets)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	6 (1)	6 (0)	6 (2)
Non-Residential Properties at risk of flooding (n)	0 (10)	0 (27)	0 (57)
Key Services at risk of flooding (n)	0 (0)	0 (2)	0 (1)
Listed Buildings (n)	0 (0)	0 (0)	0 (0)
Infrastructure (km)			
Primary/Trunk Roads (km)	0 (0)	0 (0)	0 (0)
Main Line Railways (km)	0 (0)	0 (0)	0 (0)
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	37.1 (53.2)	5.8 (37.1)	10.0 (12.6)
Ancient Woodland	2.6 (0)	0.3 (0)	0.6 (0)
Country Parks	0 (10.5)	0 (0)	0 (2.2)
Local Nature Reserves (LNR)	0 (0)	0 (0)	0 (0)
National Nature Reserves (NNR)	0 (0)	0 (0)	0 (0)
Ramsar Sites	0 (0)	0 (0)	0 (0)
Registered Parks and Gardens	0 (0)	0 (0)	0 (0)
Scheduled Ancient Monuments (SAM)	0 (0)	0 (0.4)	0 (0)
Sites of Interest for Nature Conservation (SINC)	1.9 (0.1)	0.2 (0.7)	0.3 (1.1)
Sites of Special Scientific Interest (SSSI)	0.2 (25.8)	0 (0)	0 (9.2)
Special Areas of Conservation (SAC)	0 (0)	0 (0)	0 (0)
Special Protection Areas (SPA)	0 (0)	0 (0)	0 (0)

10.5 Flood Risk from Groundwater

Flood risk from groundwater has been considered by reference to three datasets. Geological information has been obtained from the British Geological Survey's 1:625,000 scale solid geology and 1:625,000 scale superficial deposits data layers. Modelled groundwater levels after a winter recharge season with 1% AEP have been obtained from JBA's Groundwater Flood Map. Information regarding JBA's Groundwater Flood Map is contained in Chapter 3 of this Strategy.

The Nedern Brook & West Pill Reen SFRA has an abundance of bedrock geologies; limestone with subordinate sandstone and argillaceous rocks located in the centre of the SFRA. Sandstone and conglomerate, interbedded are present towards the north and south. Smaller mudstone, siltstone and sandstone bedrock compositions exist towards the centre of the SFRA.

The Nedern Brook & West Pill Reen SFRA is underlain by superficial deposits only towards the southern edge of the SFRA. These deposits mainly consist of clay, silt and sand but also include small amounts of sand and gravel deposits.

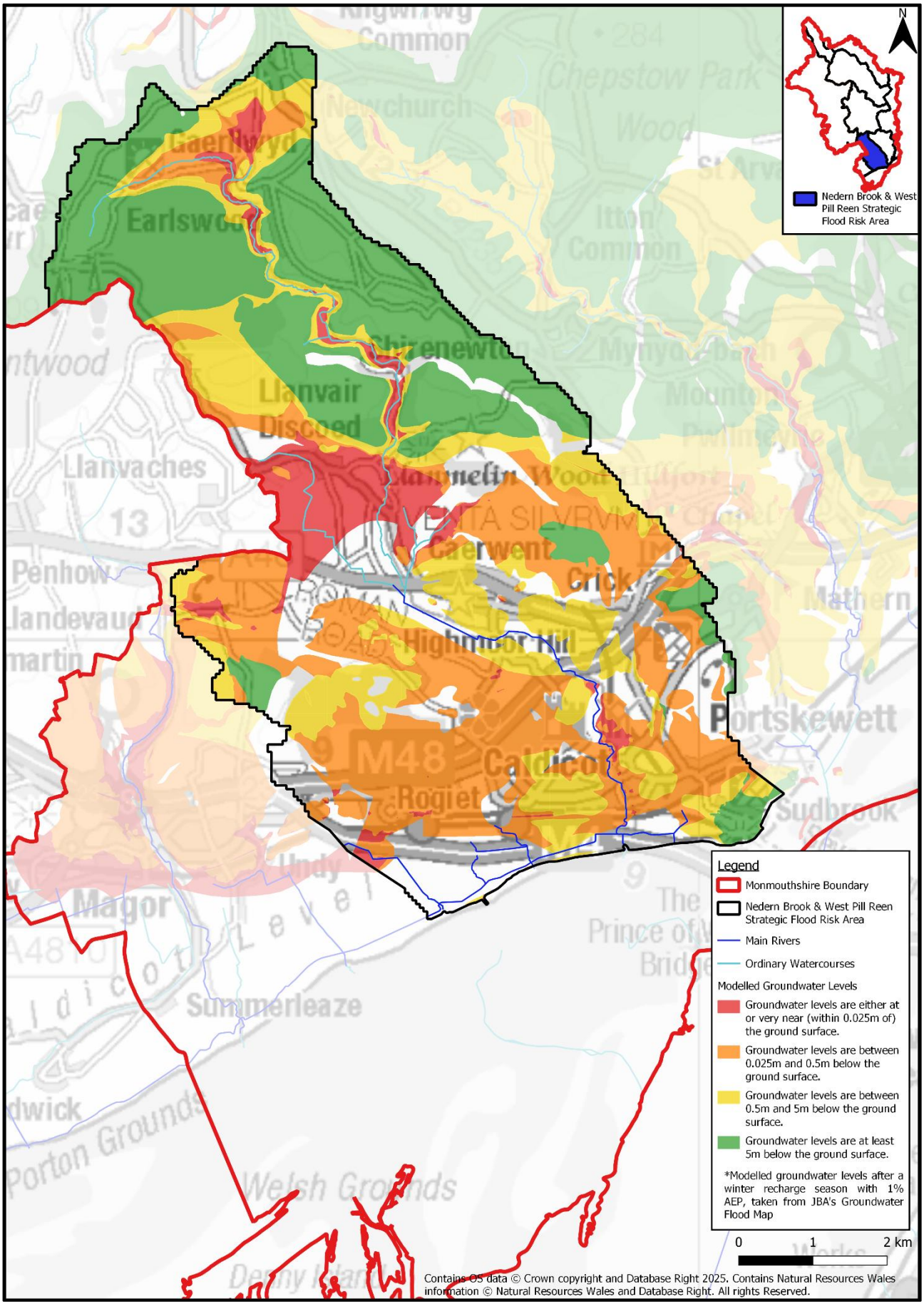
Groundwater is modelled to be present across the majority of the SFRA. Areas with modelled groundwater levels in the 1% AEP within 0.025m of the ground surface include a large area to the south of Llanvair Discoed, and along the river corridor of the Nedern Brook. Within this region the bedrock geology is predominantly limestone. Across the northern extent of the SFRA, modelled groundwater levels in the 1% AEP are predominantly at least 5m below ground level.

Across the southern extent of the SFRA, modelled groundwater levels in the 1% AEP are predominantly between 0.025 and 0.5m below ground level.

Modelled groundwater levels in the 1% AEP are shown in Figure 33. Transparent areas on the mapping indicate a negligible risk of groundwater emergence due to the nature of the local geological deposits and depth of ground water below ground level.

Two notable features in this SFRA are the Nedern Brook Wetlands and the Great Spring. The Nedern Brook Wetlands is a SSSI that is subject to seasonal flooding, when in winter water levels rise in the Carboniferous limestone aquifer below the site to form a temporary freshwater lake. The Great Spring at Sudbrook was encountered during the construction of the Severn Tunnel in 1879, when a sudden influx of fresh water flooded the tunnel. A permanent pumping station at Sudbrook was needed to pump water from the tunnels directly into the Seven Estuary. Those pumps are now managed by Network Rail. A hydrological and hydrogeological investigation at the Nedern Brook Wetland SSSI was undertaken by the British Geological Survey in 2016.

Figure 33. Nedern Brook & West Pill Reen SFRA – Flood Risk from Groundwater



10.6 Flood Action Plan

The actions proposed within the Nedern Brook & West Pill Reen SFRA Flood Action Plan are listed in Table 25 below.

Table 25. Nedern Brook & West Pill Reen SFRA Action Plan

SFRA Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Nedern Brook & West Pill Reen 1	**Flood Risk Assessment** Undertake a catchment wide assessment of flood risk to identify properties, businesses and infrastructure at greatest risk of flooding from local sources.	Nedern Brook & West Pill Reen SFRA	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Commenced
Nedern Brook & West Pill Reen 2	**Caldicot Community Flood Plan** Support the local community in developing a community flood plan.	Caldicot	Preparedness, Protection	7, 8, 9, 14, 15 & 16	Medium Term	Medium	Revenue	Not Started
Nedern Brook & West Pill Reen 3	**Caldicot Country Park** Develop and implement a Catchment Management Plan for the reach of the Nedern Brook running through the Caldicot Castle Country Park to ensure flood risk is suitably considered in the management practices of the watercourse.	Caldicot	Protection	9, 10, 11 & 12	Short	Low	Revenue	Commenced
Nedern Brook & West Pill Reen 4	**Caldicot** Work with other Risk Management Authorities in the consideration and mitigation of flood risk at Castle Lea, Castle Lodge Crescent and Castle Lodge Close.	Caldicot	Protection	10 & 15	Short	Low	Revenue	Commenced
Nedern Brook & West Pill Reen 5	**Portskewett** Identify and review options to reduce known flood risk from local sources.	Portskewett	Preparedness, Protection	8, 9, 10, 14, & 15	Medium Term	Low	Capital	Not Started
Nedern Brook & West Pill Reen 6	**Rogiet** Identify and review options to reduce known flood risk from local sources.	Rogiet	Preparedness, Protection	8, 9, 10, 14, & 15	Medium Term	Low	Capital	Not Started

11 Mill Reen SFRA Flood Action Plan

This Action Plan describes the nature, extent and location of flood risk within the Mill Reen Strategic Flood Risk Area (SFRA) with an emphasis on local sources of flood risk i.e. surface water, small watercourses and ground water. It also sets out the actions MCC will undertake, or are already in the process of undertaking, to manage flood risk from local sources.

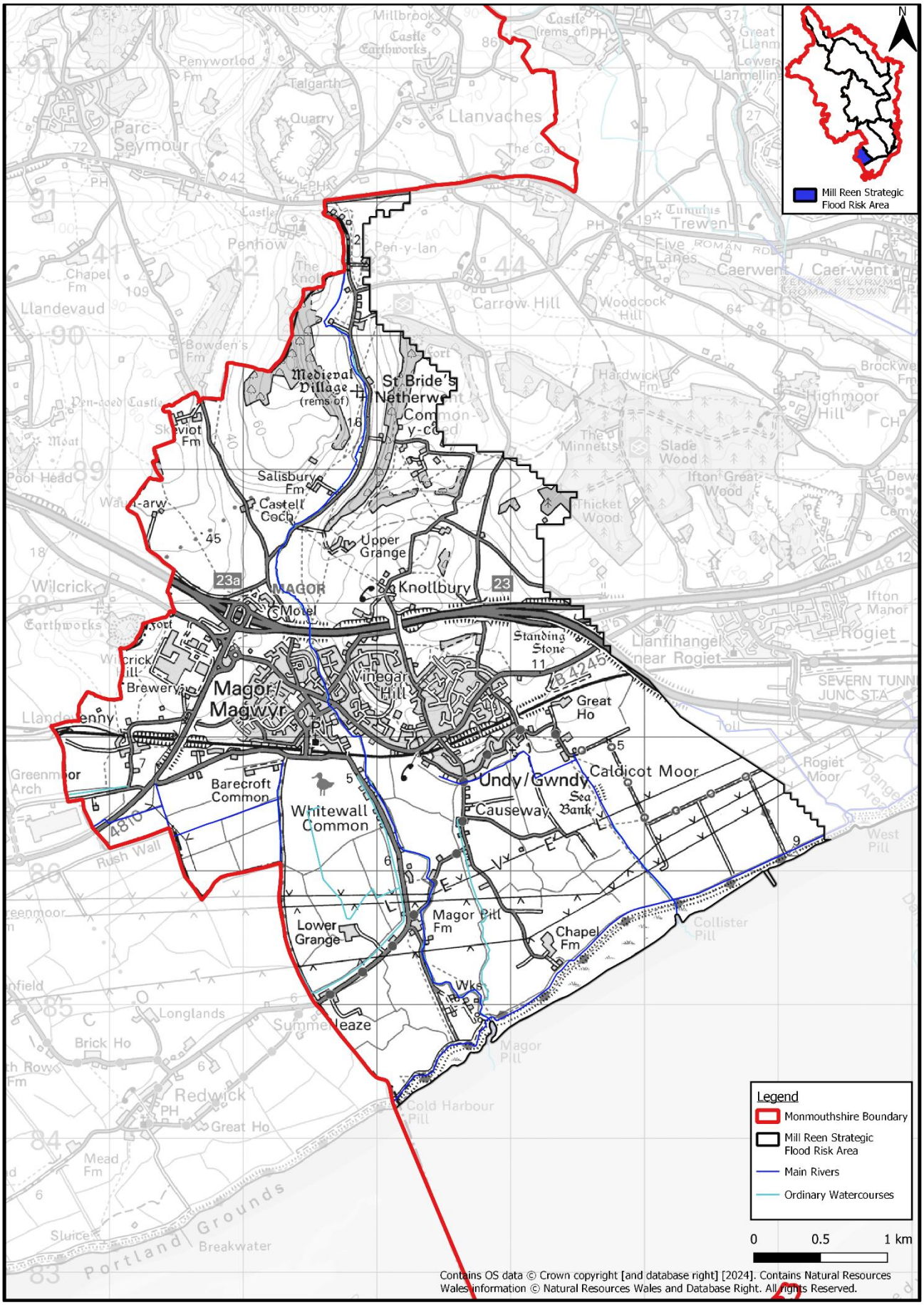
11.1 Mill Reen SFRA Description

The Mill Reen Strategic Flood Risk Area (SFRA) covers approximately 18km² and is located in the south-west of Monmouthshire, where it borders Newport City Council to the west and the Nedern & West Pill Reen SFRA to the east. The SFRA is relatively small in comparison to the other SFRAs with the Severn Estuary along the southern boundary, as shown in Figure 34.

North of the M4 the area is typically rural with high ground to the north. The main settlements of Magor and Undy are located in the centre of the SFRA just south of the M4 motorway, which along with the B4245, bisect the area in an east-west direction. The South Wales Main Line runs in the same direction along the southern edge of the main settlements. The Gwent Levels can be found south of the railway line where an intricate network of reens are managed by Natural Resources Wales as part of the Gwent Internal Drainage District. Coastal defences in the form of raised embankments are located along the southern boundary.

The main watercourse here is the St Brides Brook which runs south from the northern boundary near the county boundary and the B4245. Further downstream the Brook becomes the Mill Reen south of the M4 motorway before discharging to the estuary at Magor Pill. Both watercourses are designated as main rivers.

Figure 34. Mill Reen Strategic Flood Risk Area



11.2 History of Flooding

LLFA records of historic flooding within the Mill Reen SFRA show the most significant event related to the Mill Reen itself. This main river event occurred in December 2020 following an intense period of rainfall falling on saturated ground that resulted in flooding to numerous residential and commercial properties as well as local roads in the Cowleaze, Dancing Hill, Dinch Hill Lane, B4245 and Whitewall areas. Surface water flooding also occurred as a result of local drainage systems being unable to discharge to the reen whilst in spate. Records also include events relating to surface water flooding in Magor at Green Moor Lane, Blenheim Avenue and B4245 Magor Road.

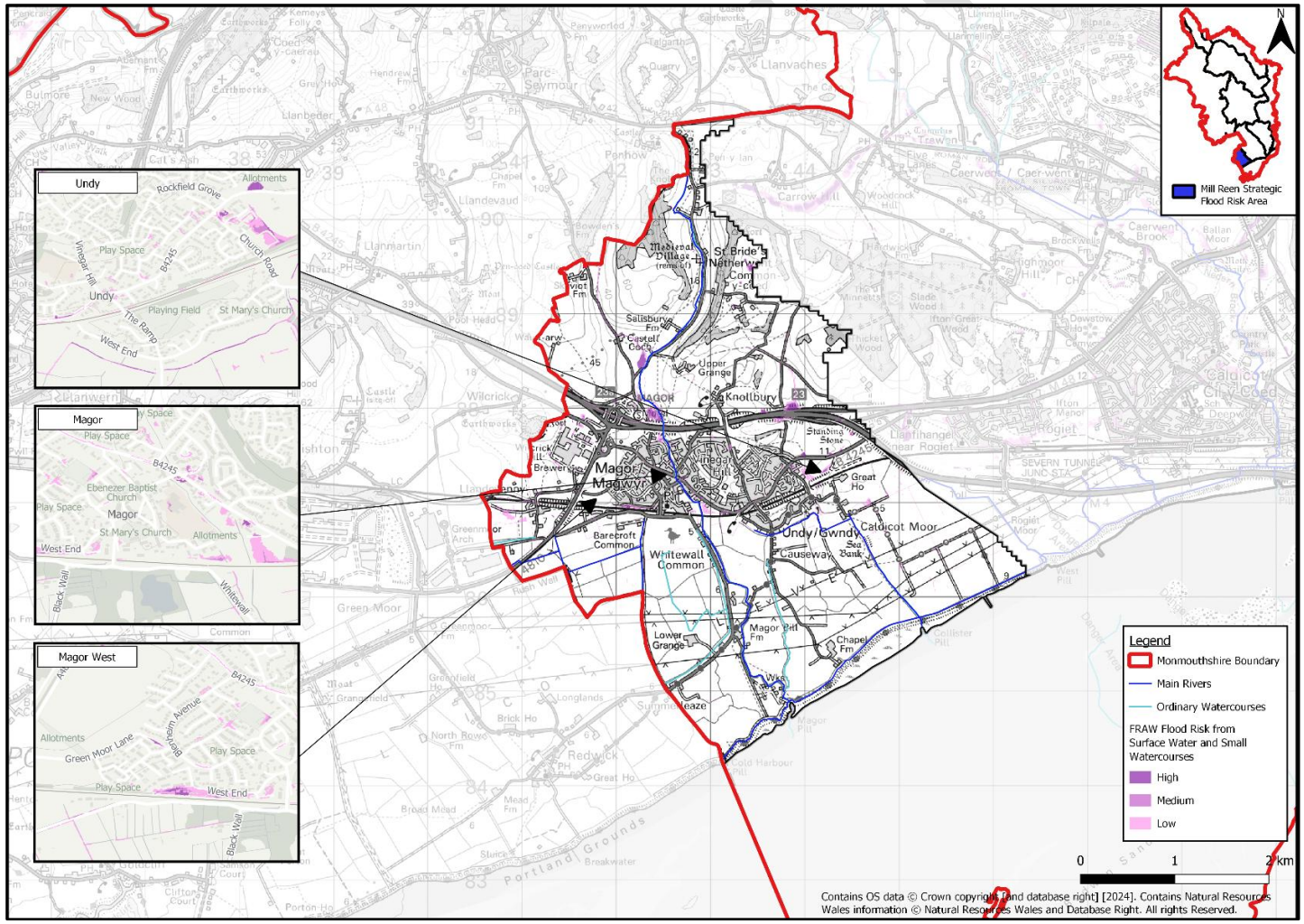
Other notable flooding incidents from local sources in the area include St Brides Road where the adjacent brook can regularly overtop, and surface water flooding at Vinegar Hill and Church Road, Undy.

The main areas at risk from flooding are primarily located adjacent to the St Brides Brook and Mill Reen. Areas at high risk from local sources include West End, Pembroke Court and properties adjacent to the B4245 Main Road.

11.3 Flood Risk from Surface Water & Small Watercourses (Pluvial)

Flood risk from surface water and small watercourses within the Mill Reen SFRA can be found on NRW's Flood Risk Assessment Wales (FRAW) map. Small watercourses are defined as those ordinary watercourses with a catchment of <3km². The main areas at risk are highlighted in Figure 35 below.

Figure 35. Mill Reen SFRA FRAW Map – Surface Water & Small Watercourses (Pluvial)



Using the Communities at Risk Register (CaRR), an assessment of flood risk from surface water and small watercourses has been undertaken. The CaRR's *"Addresses at Risk"* GIS layer has been used to assess Residential, Non-Residential Properties and Key Services at risk.

In total 7 residential properties are shown to be at high risk of surface water flooding in the Mill Reen SFRA. These properties are located in Magor and Undy at the centre of the SFRA. Residential properties at medium to low risk are also located in the more urban areas of Magor and Undy. In total there are 4 residential properties at medium risk and 67 at low risk.

Non-residential properties and key services at risk of surface water flooding are found in Magor towards the west of the SFRA.

Minor sections of the M4 (trunk road) and railway line are at low risk of flooding from surface water and small watercourses.

The results of the assessment of flood risk from surface water and small watercourses is shown in Table 26 below.

Table 26. Mill Reen SFRA – Flood Risk Counts from Surface Water and Small Watercourses (Pluvial)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	7	4	67
Non-Residential Properties at risk of flooding (n)	1	0	6
Key Services at risk of flooding (n)	0	1	1
Listed Buildings (n)	0	0	0
Infrastructure (km)			
Primary/Trunk Roads (km)	0	0	0.1
Main Line Railways (km)	0	0	0.2
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	3.0	1.2	5.5
Ancient Woodland	0	0	0
Country Parks	0	0	0
Local Nature Reserves (LNR)	0	0	0
National Nature Reserves (NNR)	0	0	0
Ramsar Sites	0	0	0
Registered Parks and Gardens	0	0	0
Scheduled Ancient Monuments (SAM)	0.1	0	0.2
Sites of Interest for Nature Conservation (SINC)	0	0.1	0.4
Sites of Special Scientific Interest (SSSI)	0.3	0.4	5.8
Special Areas of Conservation (SAC)	0	0	0
Special Protection Areas (SPA)	0	0	0

11.4 Flood Risk from Rivers (Fluvial)

Using the Communities at Risk Register (CaRR) and NRW's Flood Risk Assessment Wales (FRAW) map, a high-level assessment of fluvial flood risk has been undertaken.

The Fluvial dataset has been considered within this Local Strategy as it contains detail on flood risk from larger ordinary watercourses which affect many areas within Monmouthshire. Main river flooding is also included within the dataset, however this falls outside of the scope of this Local Strategy. The high-level assessment has included the approximate separation of areas at risk from either ordinary watercourses or main rivers, the results of which are shown in Table 27.

Locations at risk from other non-local sources of flooding, in this case main river and tidal flooding, have been included in brackets in Table 27 for reference.

Figure 36. Mill Reen SFRA FRAW Map – Rivers (Fluvial)

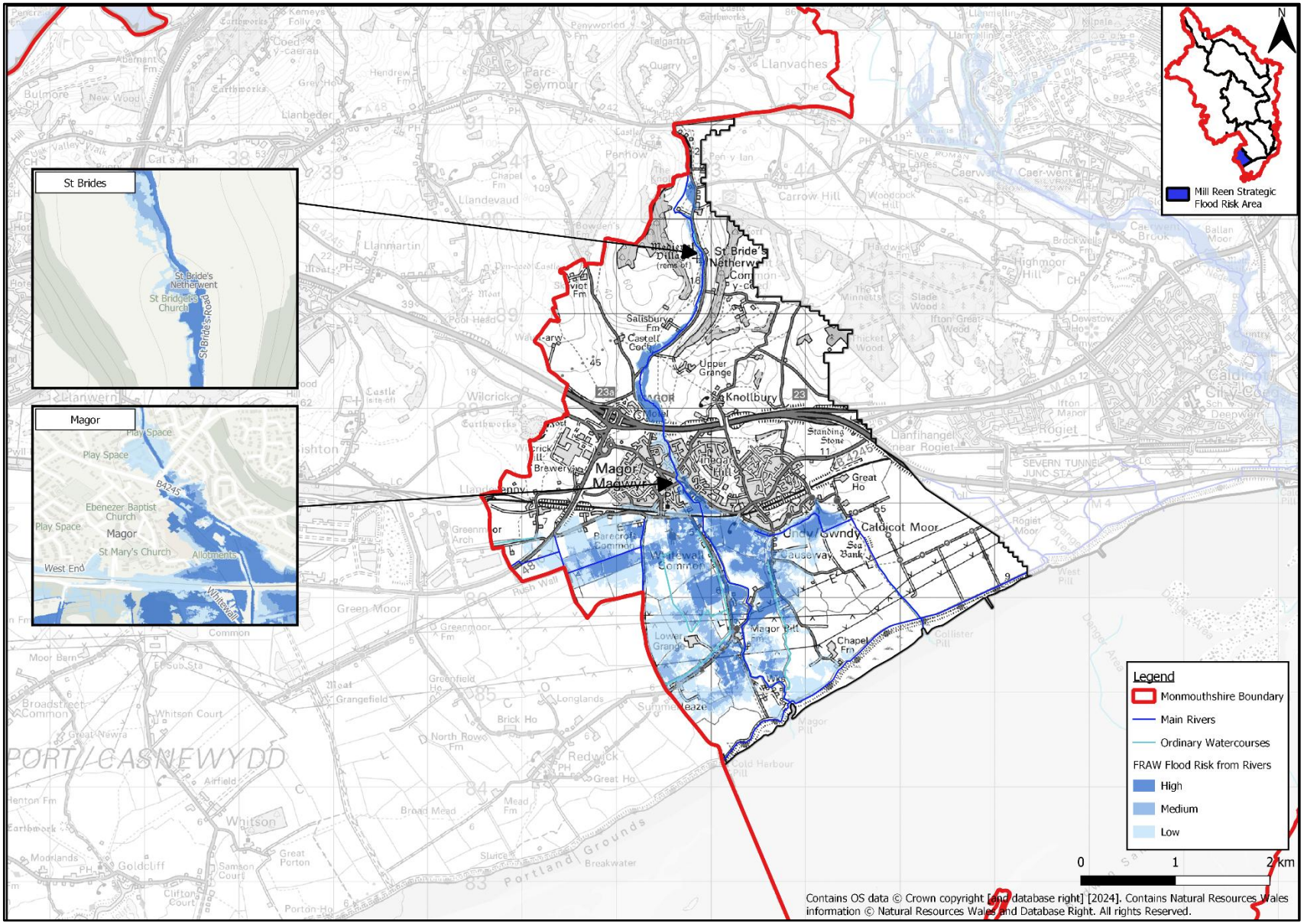


Table 27. Mill Reen SFRA – Flood Risk Counts from Ordinary Watercourses (Fluvial) (Main river counts in Brackets)

Receptor	High Risk (Chance of flooding greater than 3.3% AEP)	Medium Risk (Chance of flooding between 3.3% and 1% AEP)	Low Risk (Chance of flooding between 1% AEP and 0.1% AEP)
Properties (n)			
Residential Properties at risk of flooding (n)	0 (17)	0 (15)	0 (95)
Non-Residential Properties at risk of flooding (n)	0 (1)	0 (3)	0 (3)
Key Services at risk of flooding (n)	0 (1)	0 (0)	0 (1)
Listed Buildings (n)	0 (0)	0 (0)	0 (0)
Infrastructure (km)			
Primary/Trunk Roads (km)	0 (0)	0 (0)	0 (0)
Main Line Railways (km)	0 (0)	0 (0)	0 (0.3)
Environmental (Hectares [ha])			
Agricultural Land - Grades 1, 2 and 3	0 (14.4)	0 (2.7)	0 (3.7)
Ancient Woodland	0 (0)	0 (0)	0 (0)
Country Parks	0 (0)	0 (0)	0 (0)
Local Nature Reserves (LNR)	0 (0)	0 (0)	0 (0)
National Nature Reserves (NNR)	0 (0)	0 (0)	0 (0)
Ramsar Sites	0 (0)	0 (0)	0 (0.2)
Registered Parks and Gardens	0 (0)	0 (0)	0 (0)
Scheduled Ancient Monuments (SAM)	0 (0.5)	0 (0.3)	0 (0.4)
Sites of Interest for Nature Conservation (SINC)	0 (3.9)	0 (4.2)	0 (10.3)
Sites of Special Scientific Interest (SSSI)	0 (102.6)	0.1 (58.3)	0.1 (146.7)
Special Areas of Conservation (SAC)	0 (0)	0 (0)	0 (0.2)
Special Protection Areas (SPA)	0 (0)	0 (0)	0 (0.2)

11.5 Flood Risk from Groundwater

Flood risk from groundwater has been considered by reference to three datasets. Geological information has been obtained from the British Geological Survey's 1:625,000 scale solid geology and 1:625,000 scale superficial deposits data layers. Modelled groundwater levels after a winter recharge season with 1% AEP have been obtained from JBA's Groundwater Flood Map. Information regarding JBA's Groundwater Flood Map is contained in Chapter 3 of this Strategy.

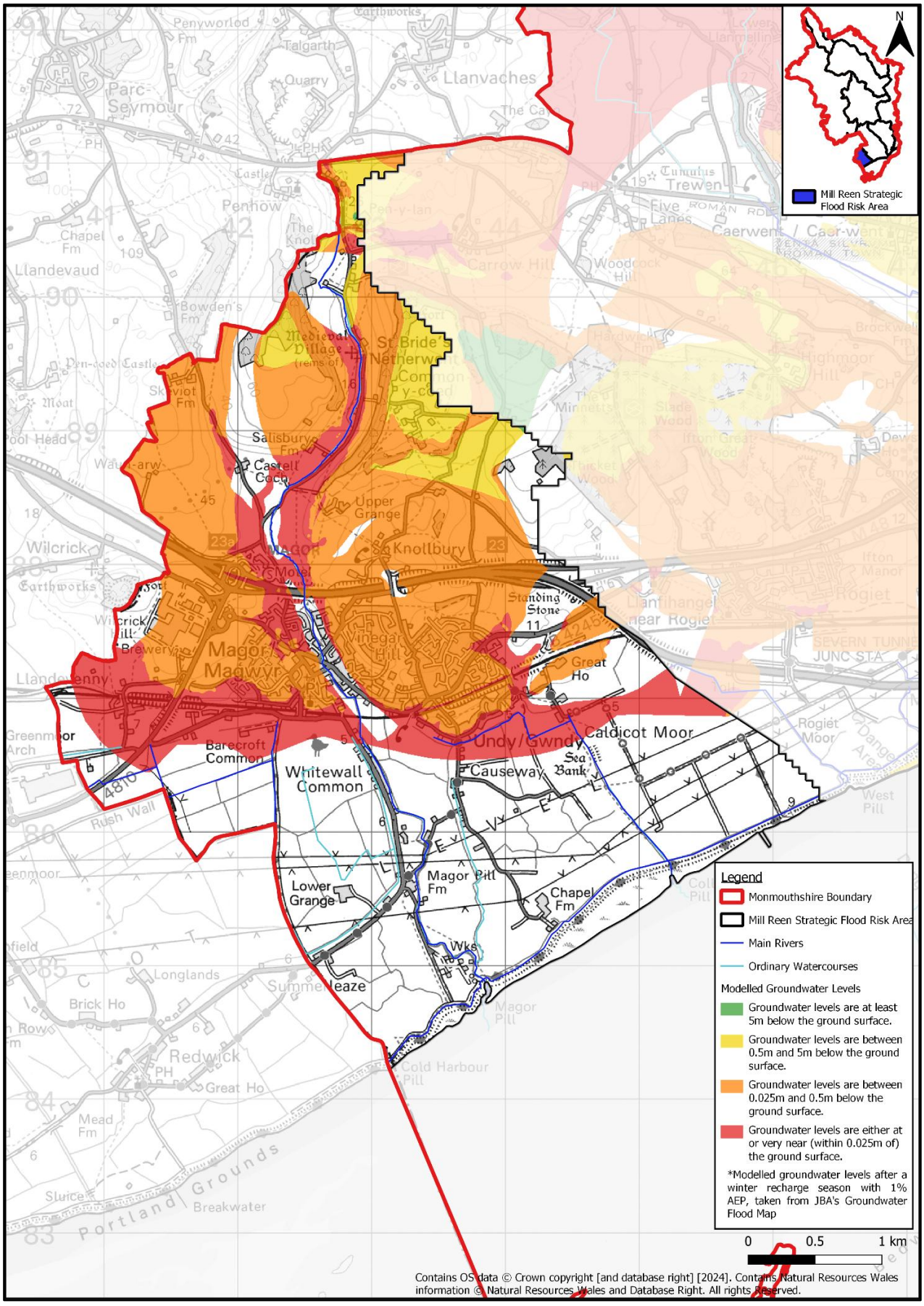
The Mill Reen SFRA has three dominant bedrock geologies: mudstone, siltstone and sandstone in the south, limestone with subordinate sandstone and argillaceous rocks in the north and interbedded sandstone and conglomerate across the west and east of the SFRA.

With regard to superficial deposits, the southernmost area of the SFRA is primarily underlain by tidal flat deposits comprising clay and silt, with alluvium (clay, silt, sand and gravel) present along the main river channel. Further north/inland, head comprising clay, silt, sand and gravel is present in the east of the SFRA with river terrace deposits (sand and gravel) in the west.

In the northern part of the SFRA, where more permeable rocks are present, modelled groundwater levels in the 1% AEP are predominantly shown to be between 0.025m and 0.5m below ground level. A band across the centre of the SFRA, west to east, contains groundwater levels in the 1% AEP modelled within 0.025m of the ground surface, suggesting a significant risk of re-emergence in a very wet year. The bedrock geology in this band contains predominantly limestones and sandstones.

Modelled groundwater levels in the 1% AEP are shown in Figure 37. Transparent areas on the mapping indicate a negligible risk of groundwater emergence due to the nature of the local geological deposits and depth of ground water below ground level. This includes the large expanse of Tidal Flat Deposits across the southern section of the SFRA.

Figure 37. Mill Reen SFRA – Flood Risk from Groundwater



11.6 Flood Action Plan

The actions proposed within the Mill Reen SFRA Flood Action Plan are listed in Table 28 below.

Table 28. Mill Reen SFRA Action Plan

SFRA Ref.	Action	Location	Action Type	Link to LFRMS Measure	Timescale	Cost	Funding	Status
Mill Reen 1	**Flood Risk Assessment** Undertake a catchment wide assessment of flood risk to identify properties, businesses and infrastructure at greatest risk of flooding from local sources.	Mill Reen SFRA	Preparedness, Protection	7, 8, 9, 10, 14, 15 & 16	Medium	Medium	Revenue	Commenced
Mill Reen 2	**Magor Community Flood Plan** Support the local community in developing a community flood plan.	Magor	Preparedness	4 & 7	Medium	Low	Revenue	Not Started
Mill Reen 3	**Magor** Identify and review options to reduce known flood risk from local sources.	Magor	Preparedness, Protection	8, 9, 10, 14, & 15	Medium	Medium	Capital	Not Started
Mill Reen 4	**Undy** Identify and review options to reduce known flood risk from local sources.	Undy	Preparedness, Protection	8, 9, 10, 14, & 15	Medium	Medium	Capital	Not Started