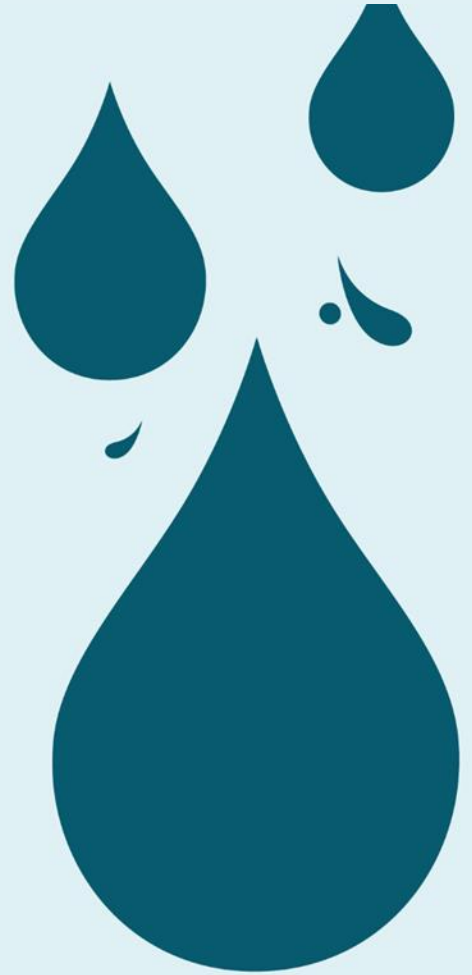


Hampshire Catchment Prioritisation

Enbourne Catchment Management Plan

Hampshire County Council
December 2021



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This document has 34 pages including the cover.

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Rev 2.0	Enbourne Catchment Prioritisation	SH				

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Hampshire County Council Economy,
Transport and Environment Department,
The Castle, Winchester,
Hampshire,
SO23 8UD

Tel: 0845 603 5638
Fax: 01962 847055
www.hants.gov.uk

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Foreword



From working with communities developing new flood action plans, to improving the management of our natural resources, the County Council's ambition is to be at the forefront of flood risk and water management creating a **safer, more resilient Hampshire**. Our priority is to **protect people, homes, businesses, and key infrastructure** by:

- **Reducing** risks and managing water resources through effective planning and design.
- **Reducing** future flooding by lessening or removing existing risks.
- **Adapting** to flood risk in order to minimise the impact and enable normal life to return as soon as possible.
- **Enabling** communities to be better prepared to react to flood events and recover more easily; and
- **Adopting** effective practices that are sustainable and affordable now and in the future and adaptable to future climate change and prediction.

Under the [Flood and Water Management Act of 2010](#), each Lead Local Flood Authority (LLFA) across the country is required to produce a Local Flood Risk Management Strategy (LFRMS). Hampshire County Council is LLFA for Hampshire and our first LFRMS was adopted in 2013, since then our knowledge of the broad nature and extent of flood risk and the implications of poor water management across Hampshire has been built upon. In light of this, Hampshire County Council has updated its LFRMS and released a [Local Flood and Water Management Strategy \(LFWMS\)](#) in November 2020.

The LFWMS has changed the way we look at flood risk and water management in the county, by taking a more holistic view of the **overall management of water both in terms of its quality and quantity**. **The strategy also takes into account the growing effects of any risks associated with Climate Change and future development on regional water management.**

In order to represent flood and water management risk in a more realistic and accurate way, the County Council has adopted a **catchment-based approach**, modelled on geographic river catchment boundaries, this allows the natural movement of water to be modelled regardless of the administrative area it lies within or the Risk Management Authority (RMA) responsible for its management

The County Council has undertaken analysis of each of the eighteen river basin catchments which fall within the Hampshire boundary and produced a **Flood and Water Catchment Management Plan (FWCMP or CMP)** for each one.

This document sets out the CMP for the **Enbourne catchment area**. This document highlights the areas within the catchment area that are at an increased risk of flooding, when compared to the rest of the catchment, as well as the various sources of flooding applicable to each area. This plan should be read alongside the County Council's LFRMS, which sets out our strategy and policy for flood risk and water management in its widest sense.

Councillor Rob Humby
Executive Member for Economy, Transport and Environment

Executive Summary

This Catchment Management Plan (CMP) follows the approach set out in [Hampshire County Council's Local Flood and Water Management Strategy \(LFWMS\)](#). This CMP seeks to **identify and prioritise areas** within the Enbourne river basin catchment that are at an **increased risk of flooding** due to **geographical, geological, or developmental features**, this may include areas which have experienced flooding in **past events**. The plan also uses other factors to determine a catchment's vulnerability to flooding and associated water management issues. These factors include **density of housing, presence of critical infrastructure and vulnerability of residents**.

The CMP seeks to understand **how and why the Enbourne catchment floods**, in order to support the introduction of a stepped approach to **interventions and preventative measures** that will reduce flood risk and improve overall water management, including drought, both now and in the future. The plan seeks to incorporate the associated future risks presented by challenges such as **climate change and increased development needs**.

Lastly, the plan is designed to **encourage greater collaboration** between partners, whether they be local residents, Risk Management Authorities (RMAs) or other organisations, to **share data and responsibilities** in order to develop appropriate Action Plans that will improve upon the catchment's resilience to current and future risks of flooding.

Figure 1 – Local Flood and Water Management Strategy Plan

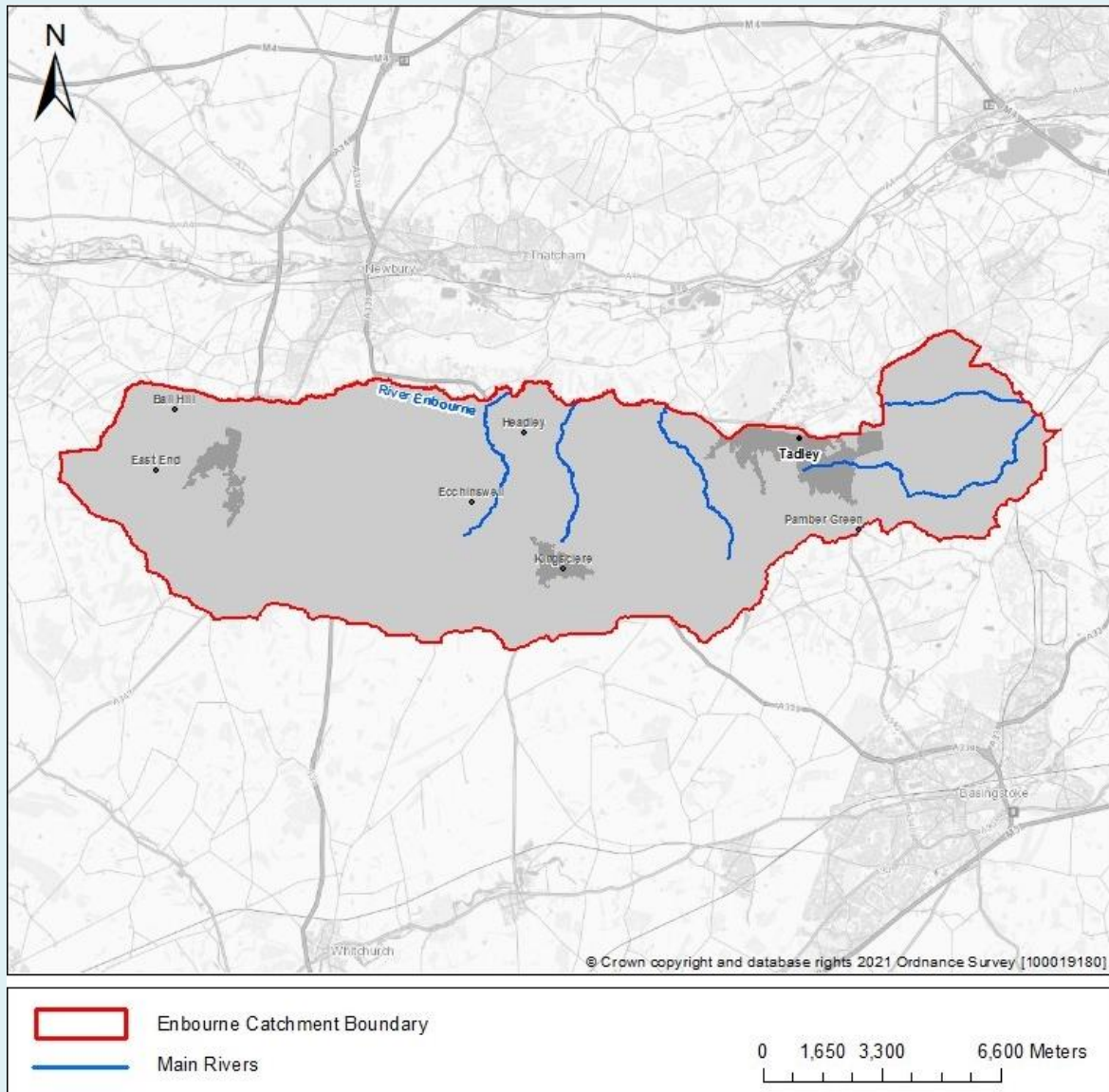


The above diagram demonstrates how the Local Flood and Water Management Strategy acts as an overarching document, drawing together Hampshire County Council's overall aspirations and policy direction for flood and water management in the county. Below this will sit a suite of **18 catchment plans**, of which this is one, based on the individual river basin catchments which fall either fully or partially within the county's borders. Individual action plans will then be developed, based on risk, for prioritised areas or communities of each catchment.

The Catchment

The **Enbourne catchment** is **146km²** in size and consists of mainly rural communities but with significant areas of urban development, mostly located along Kiln Pond, Bishop's Wood Stream, Silchester Brook and other unnamed tributaries.

Figure 2 – Study Area



The **sources of flooding** for the Enbourne catchment include **surface water, fluvial, sewers** and **groundwater**, depending on the area within the catchment. Details and description of the major sources of flooding are included in **Catchment Description Section** of this report. This CMP has adapted the Hampshire Catchment Prioritisation tool, developed in 2017, to assess the risk and impact of flooding in the Enbourne catchment area from different sources at a strategic level.

Communities vulnerable to similar sources of flooding have been grouped together and ranked in descending order of risk, impact, and damage. Groups that met the minimum criteria were classified as Priority Areas that are at the most significant risk of flooding. This has identified **1 Priority Area** that are at the most significant risk of flooding: **Tadley**.

Tangible **Action Plans** will be developed for each of these Priority Areas to mitigate flood risk. The Action Plans will include a range of possible interventions and measures such as:

- **Natural flood management** measures.
- Management of water in **upper catchments**.
- Management of water through the catchment, for example, **sustainable drainage systems (SuDS)**.
- **Hard engineering measures** such as flood defence walls/embankments and structures.
- Directed policy development and guidance.
- Property Level Resilience; and
- Emergency response.

Figure 3 – Natural Flood Management Hierarchy



Hampshire County Council will implement its statutory duties to ensure that **new developments will not increase flood risk**, with a move towards seeking betterment in the more vulnerable areas highlighted in this CMP. Only new developments that demonstrate an understanding of **sustainable water management and environmental sensitivity**, and which provide appropriate mitigation and adaptation, based on the **Preferred Discharge Destination Hierarchy** (figure 4) will be encouraged. This will ensure that the Enbourne catchment becomes more resilient to flood risk both now and in the future.

Figure 4– Preferred Discharge Destination Hierarchy

Preferred discharge destination hierarchy

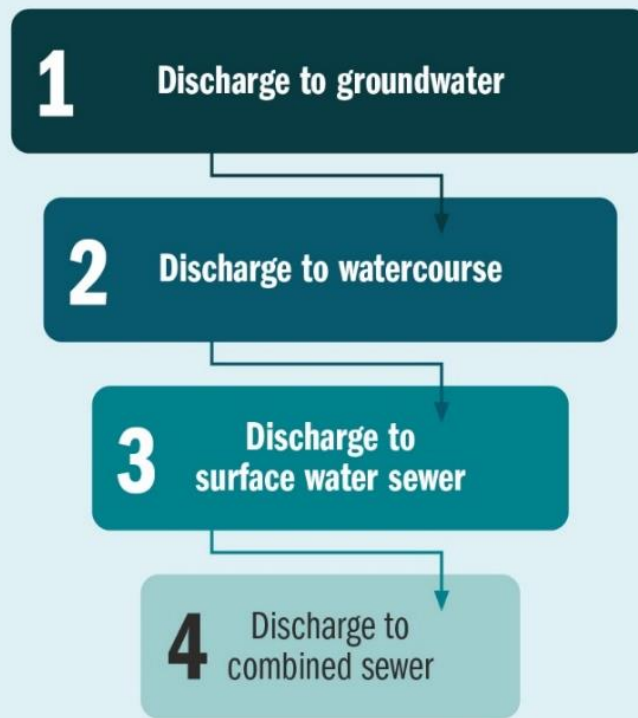


Figure 6 - Hampshire Catchment Areas

Catchment areas



In 2017, a Geographical Information System (GIS) based **Catchment Prioritisation Tool** was developed for Hampshire County Council to help identify those catchments most at risk from flooding within the county. By combining risk adjusted scores based on up to nine different criteria and taking into account both risk to assets from different sources of flooding, recorded evidence of past flooding, and the future challenges of Climate Change, the CPT provides a **robust, evidence-based approach** to support the strategic prioritisation of investment, inform discussions with key stakeholders, and underpin the Lead Local Flood Authority's LFWMS.

The Hampshire catchment prioritisation tool has been used to support the principal objectives of this CMP:

- Establish the **causes and sources of flood risk** within the Enbourne catchment area and identify the geographic areas and communities that are at the highest risk of flooding.
- Assess the **potential impact** of flooding to the properties and strategic infrastructure assets located within those areas; and
- **Inform** the development of effective Action Plans that can be used by the County Council, risk management authorities and other partners, and local communities to improve water management and resilience to flooding in the catchment area both now and in the future.

Key Stakeholders

There are a **number of key stakeholders** that play an important role in improving water management and flood resilience across the Enbourne catchment. These key stakeholders are also involved in the preparation of **Flood Action Plans** and **maintenance of existing infrastructure** and have provided information in the development of this CMP. Hampshire County Council has formed the **Hampshire Strategic Flood Risk Partnership Board**, which involves the relevant Risk Management Authorities, to share ideas and steer the strategic direction of flood management in the Hampshire area. These and other key stakeholders, and their responsibilities, are listed in the table below.

Table 1 - Key Stakeholders

Organisation	Risk Management Authority (as per the Flood and Water Management Act) and member of the Strategic Flood Risk Partnership Board	Role within the Enbourne Catchment Plan	Specific Role
Environment Agency	Yes	Main River and sea flooding overview	Responsible for managing flood risk from main rivers and the sea and has a strategic overview of all sources of flooding and coastal erosion Statutory Consultee
Lead Local Flood Authority (Hampshire County Council)	Yes	Managing local flood risk sources (i.e., surface water, ground water and ordinary watercourses)	Consenting authority for ordinary watercourses Developing a plan/strategy for local sources of flooding Emergency Planning function Preparing and submitting bids to mitigate local sources of flooding Working with local communities on flood resilience plans Statutory Consultee on major planning applications
Highway Authority (Hampshire County Council and Highways England)	Yes	Highway drainage infrastructure	Drainage of the highway
National Park	N/A	N/A	N/A
Basingstoke and Dean Borough Council	Yes	Planning and emergency planning role within the Council's jurisdictions	Local Plans & Planning Policy, Determining/Enforcing planning applications Preparing and submitting bids to mitigating local sources of flooding Working with local communities on flood resilience plans, Environmental Health- Powers on

Organisation	Risk Management Authority (as per the Flood and Water Management Act) and member of the Strategic Flood Risk Partnership Board	Role within the Enbourne Catchment Plan	Specific Role
			private sewer systems, Riparian Landowner
Coastal Partners	N/A	N/A	N/A
Water and sewerage companies – Thames Water	Yes	Responsible for the risk of flooding to water supply and sewerage facilities and the risk to others from the failure of their infrastructure	Preparation of Infiltration Reduction plans and Drainage Action Plans (DAPs), Drainage and Wastewater Management Plans
Network Rail	No	Railway drainage infrastructure	Drainage of the railway
Hampshire and Isle of Wight Wildlife Trust	No	Lead on biodiversity issues	Provide input on natural solutions to help prevent flooding; land management; water quality issues etc.
Kennet Catchment Partnership	No	Partnership of organisations interested in improving the water environment	Coordinating local projects and resources, providing advice, guidance, networking, awareness raising
Parish and Town Councils: Tadley, Aldermaston and Pamber *	No	Flood Action Groups and other community groups	Responsible for managing the flood risk on their property including any <u>watercourse</u> and <u>private sewers</u> .
Riparian landowners	No		Responsible for managing the flood risk on their property including any <u>watercourse</u> and <u>private sewers</u> .

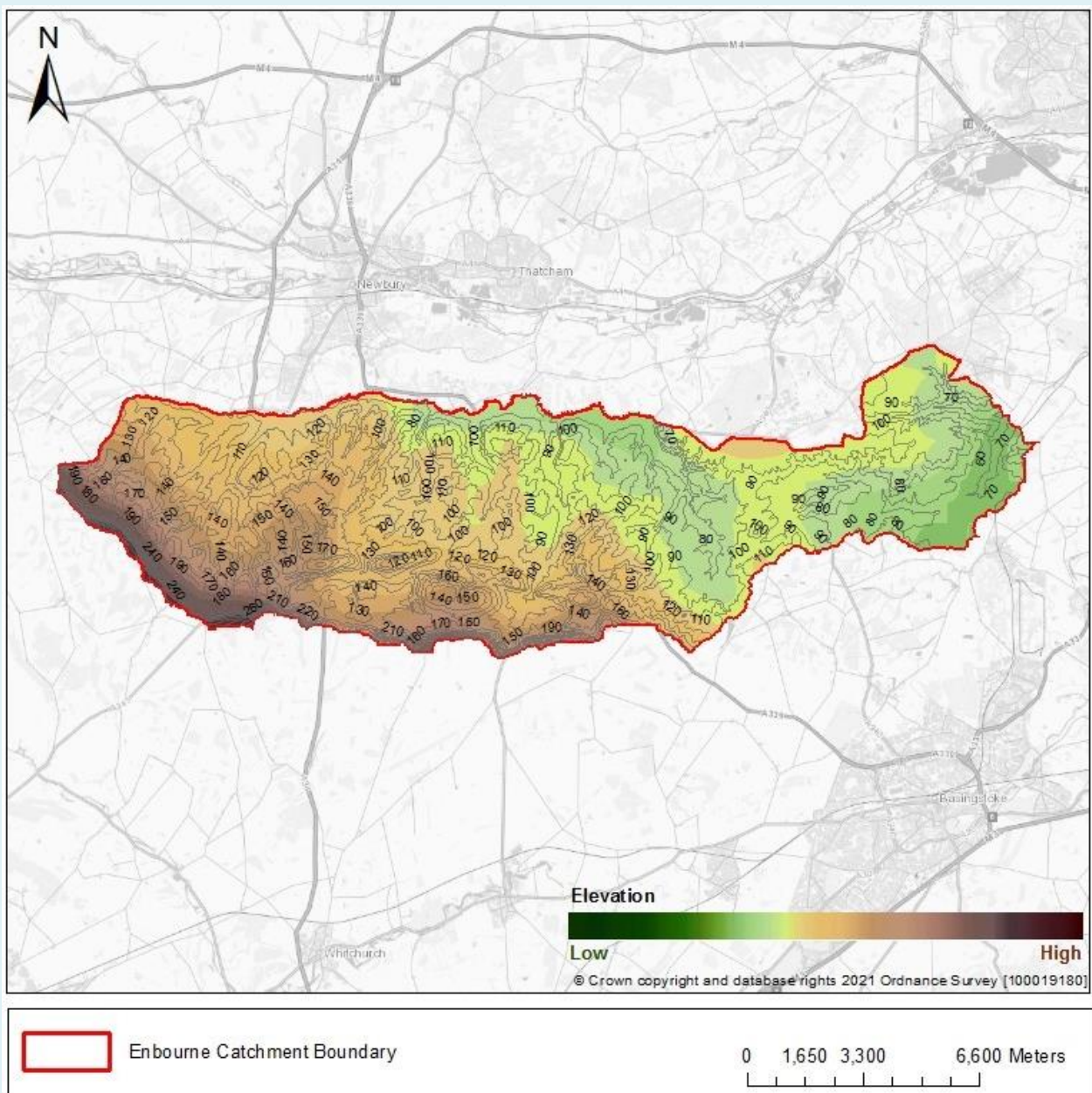
* Hampshire County Council will work with all parishes where relevant. The parishes listed are those covering the Catchment Priority Areas in this plan.

Hampshire County Council will encourage effective partnership working and ensure that all roles and responsibilities are clearly defined for risk management authorities and other key stakeholders across the Enbourne catchment.

Enbourne Catchment Description

The Enbourne catchment area is 146km². The River Enbourne forms the northern boundary of Hampshire and so, in this instance, also the northern boundary of the catchment. The catchment falls northeast from a local high point of 261m AOD at the top of Beacon Hill along the southwestern boundary of the catchment to a local low point of 60m AOD, near Hythe End at the confluence of the River Enbourne and an unnamed tributary on the northern boundary. A second sub-catchment has been included in the Enbourne on the eastern side of the catchment with an even lower discharge point. This occurs at the south-eastern corner of the catchment near Tan House Bridge at the confluence between the Silchester Brook and the West End Brook. Here ground levels are as low as 55m AOD.

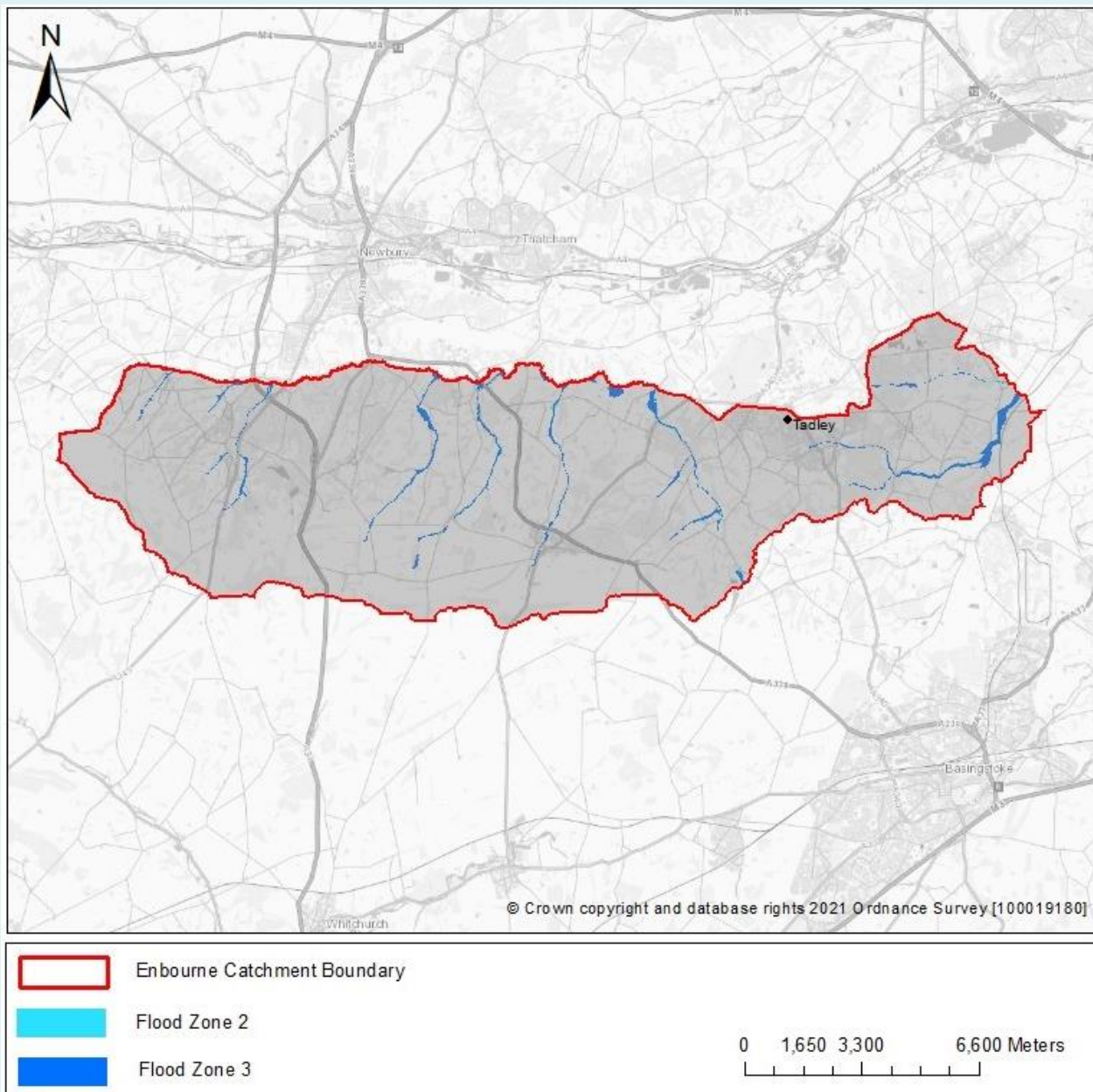
Figure 7 – Topography of the Enbourne catchment



The catchment comprises of the **River Enbourne**, the **West End Brook**, **Bishop's Wood Stream**, **Honeymill Brook**, **Silchester Brook**, **Kiln Pond**, and various unnamed tributaries. The River Enbourne originates outside of Hampshire in West Berkshire but starts to form the Hampshire boundary at the confluence between the River Enbourne and an unnamed tributary near Hazelwood Stud in the far west of the catchment. Most watercourses in this catchment flow north directly into the River Enbourne. The Bishop's Wood Stream, the Kiln Pond, the West End Brook and the Silchester Brook however, flow east before joining the Foundry Brook within the Borough of Wokingham. While this small sub-catchment does not flow into the River Enbourne directly, both the Enbourne and the Foundry Brook flow into the River Kennet (located outside of Hampshire) and so they have been grouped together within this catchment plan.

The chalk aquifer on the southern side of the catchment feeds these watercourses which form at the boundary between the White and Grey chalk and the less permeable Thames Group and Gault Formation. The catchment is mostly rural in nature but with a few urban areas in places. As such an unnamed, Main River tributary flows through Kingsclere and the Bishop's Wood Stream, the Kiln Pond and the Silchester Brook flow through Tadley.

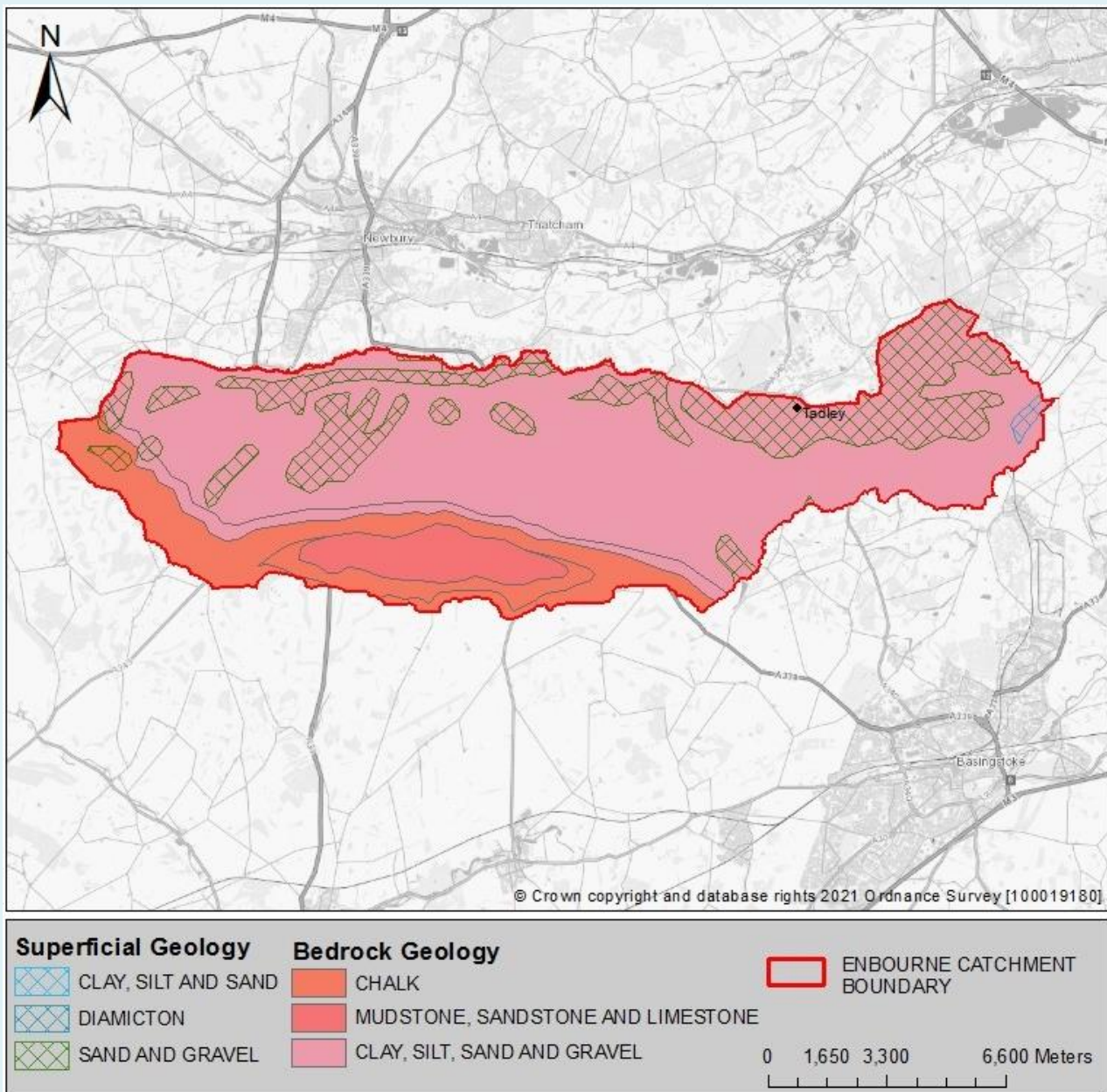
Figure 8 - Environment Agency Flood Map for Planning (Rivers and Sea) for the Enbourne catchment



Along the southern boundary runs a strip of highly permeable white Chalk with some areas of grey chalk, which serve as the principal aquifer for the Enbourne. Here, responses of watercourse levels to rainfall are low relative to the rest of the catchment. Within the band of chalk is a small area of Gault Formation and Upper Greensand Formation, a combination of mudstone, sandstone, and limestone. Given the lower permeability in this area, one or two small watercourses have formed in this area.

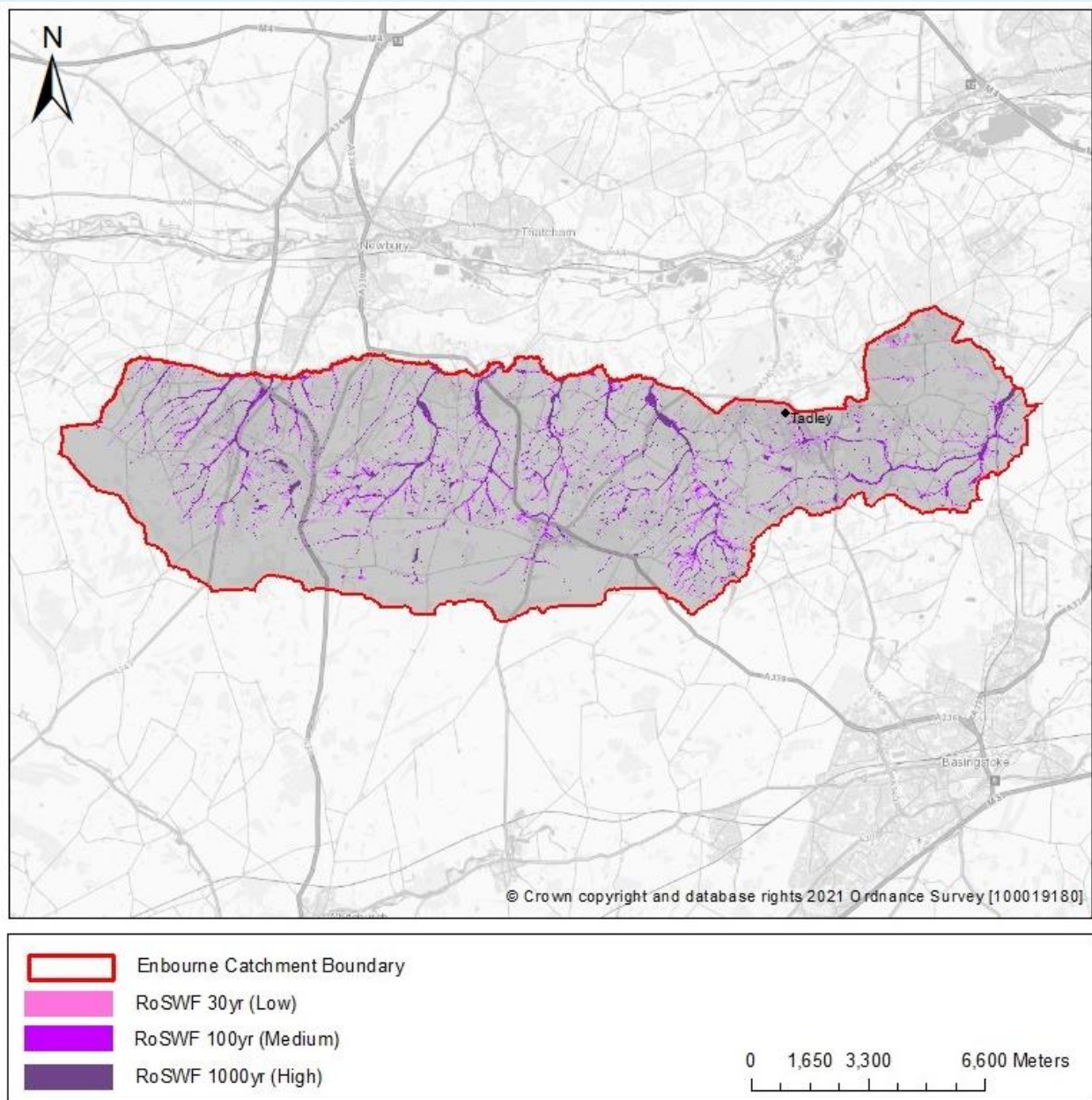
The rest of the central and northern area of the catchment consists of the much less permeable Thames Group which is made up of clay, silt, sand, and gravel. Patches of superficial geology, mostly in the form of sand and gravel, overlays the Thames Group, particularly along the northern boundary. As a result, watercourses form at the boundary between the permeable chalk and the less permeable Thames Group. Wells are also dotted around the southern part of the catchment. Where permeable superficial geology overlays the less permeable Thames Group, issues with perch water tables may also be a problem.

Figure 9- Geology of the Enbourne catchment



The response of the watercourse levels to rainfall within the central and northern half of the catchment is higher due to increased urbanisation and density of impermeable surfaces, and the reduced permeability of the underlying bedrock formation. This is reflected in the Environment Agency’s (EA) Flood Map for Planning (Figure 8), and in the Risk of Flooding from Surface Water (RoFSW) map (Figure 10), where the extent of fluvial and pluvial flooding is higher compared with the southern half of the catchment.

Figure 10 - Environment Agency Flood Risk from Surface Water Map for the Enbourne catchment



It should be noted that the flood extent shown in the figures does not account for existing drainage features that are likely to be prevalent in the urban areas of the catchment, therefore the risks shown are precautionary. The impact that drainage has on the risk of surface water and fluvial flooding may be investigated further for high priority groups where projects relating to mitigating flood risk may be undertaken.

Climate and Flood Risk

The proximity of Hampshire to Europe means that the area is affected by continental weather influences and is out of the path of most Atlantic depressions, with their associated cloud, wind, and rain. This provides some shelter from rain bearing south-westerly winds, particularly in the north of Hampshire. The South Downs, being the most exposed to these depressions, is the wettest.

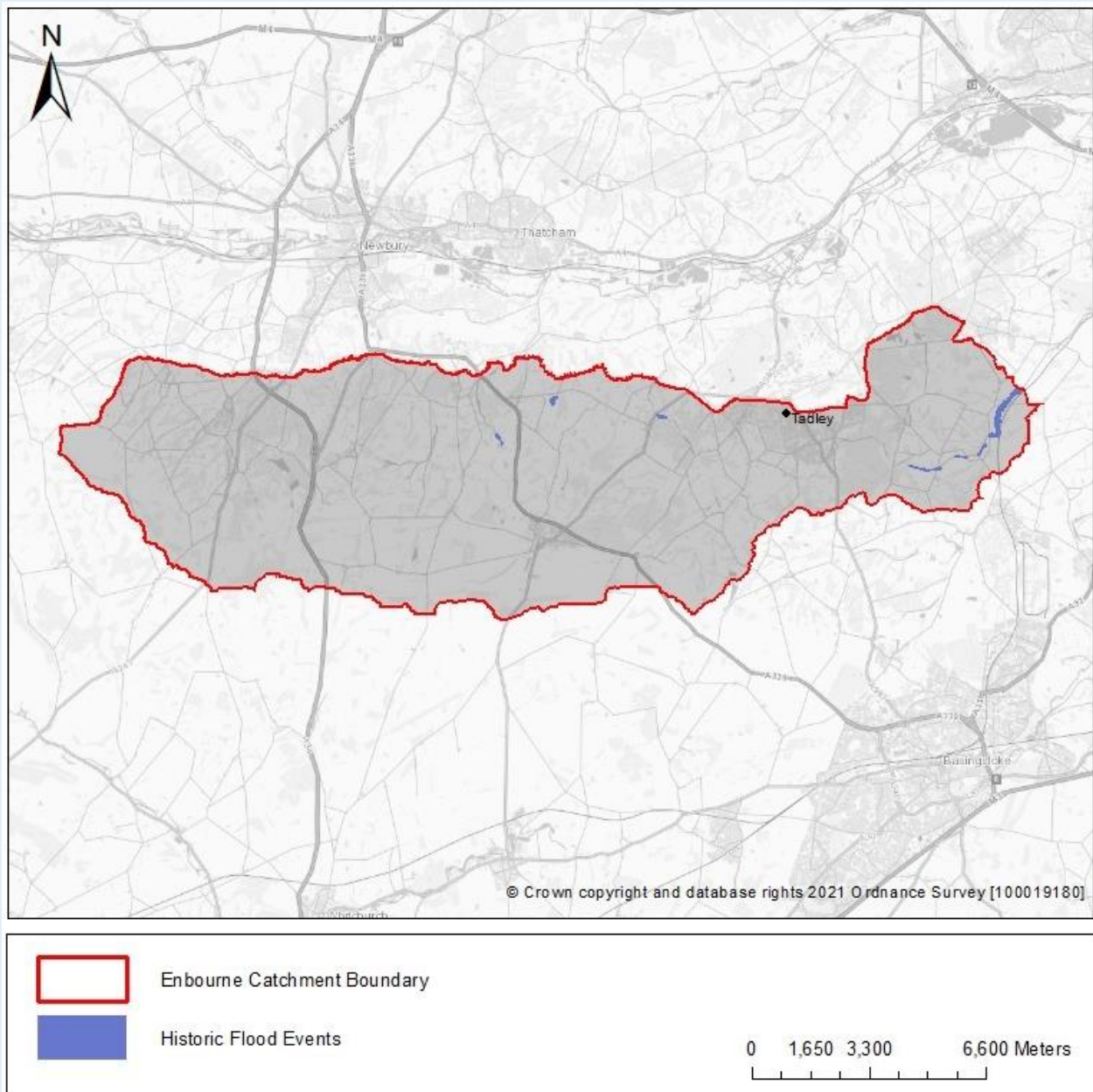
Rainfall is generally well distributed through the year but with pronounced maximums in autumn and early winter. In the north of Hampshire, there are significant amounts of rain in the summer associated with high intensity, convective rainfall that can result in short duration flooding. In winter, prolonged rainfall can lead to wide-spread flooding especially where soils are saturated. Hampshire is also vulnerable to drought if a drier than average winter and consecutive summer occur, as reservoirs and chalk aquifers will not have fully recharged.

Flooding within the Enbourne catchment occurs from **rivers, surface water, groundwater, sewers, and other artificial sources**. Indicative model outputs from these sources of flooding, as well as historical records of flooding within the catchment, are available in the Basingstoke and Dean Borough Council's **Strategic Flood Risk Assessments (SFRA)**. It is important to recognise that during a flood event, flooding can and does occur from a **combination of sources**. This is particularly relevant when considering the historical records and reports of flooding which show that incidents have been scattered throughout the Enbourne catchment, along the paths of the watercourses and existing overland flow routes, as shown in the figure below.

In the chalk areas of the Enbourne catchment there are a **limited number of permanent watercourse features**. Chalk is a major aquifer capable of absorbing large amounts of rainfall and releasing it slowly over a long period. This buffering effect, together with the mainly rural nature of the chalk area, means that the southern part of the Enbourne catchment has relatively narrow ranges of flow in a normal year and generally floods within a very limited geographical extent from short to medium duration heavy rainfall. However, after prolonged rainfall the water table in the chalk aquifer can rise to the surface causing springs to erupt in the valley floors and the creation of temporary watercourses. This can lead to groundwater flooding lasting for several months in very wet winters.

In the northern and central areas of the catchment, rainfall on what is predominantly Thames Group (clay, silt, sand, and gravel), Gault Formation and Upper Greensand Formation (mudstone, sandstone, and limestone) produces relatively rapid runoff. This shortening of the response time in this part of the catchment leads to higher risks of both surface water and fluvial flooding in a number of areas.

Figure 11 - Recorded historical flooding events in the Enbourne catchment



Please note the historic flood map only shows the recorded flood extents within this catchment. It does not show individually reported flood incidents. A lack of recorded flood extents does not necessarily mean that flooding has not occurred in the area.

Prioritisation Assessment

This Catchment Prioritisation Assessment seeks to **identify and prioritise areas** within the Enbourne river basin sub-catchments that are at an **increased risk of flooding** due to **geographical, geological, or developmental features**; this may include areas which have experienced flooding in **past events**.

The priority groups identified by the prioritisation assessment within the Enbourne catchment are presented in Figure 12 below. **Table 2** below summarise the priority group's features, the principal sources of flooding and the impact these sources have on properties and key infrastructure. The outcome of this assessment is to allow greater understanding as to how and why the Enbourne catchment floods, in order to support the introduction of a stepped approach to **interventions and preventative measures** that will reduce flood risk and improve overall water management, including drought, both now and in the future.

Figure 12 – Enbourne Catchment priority groups

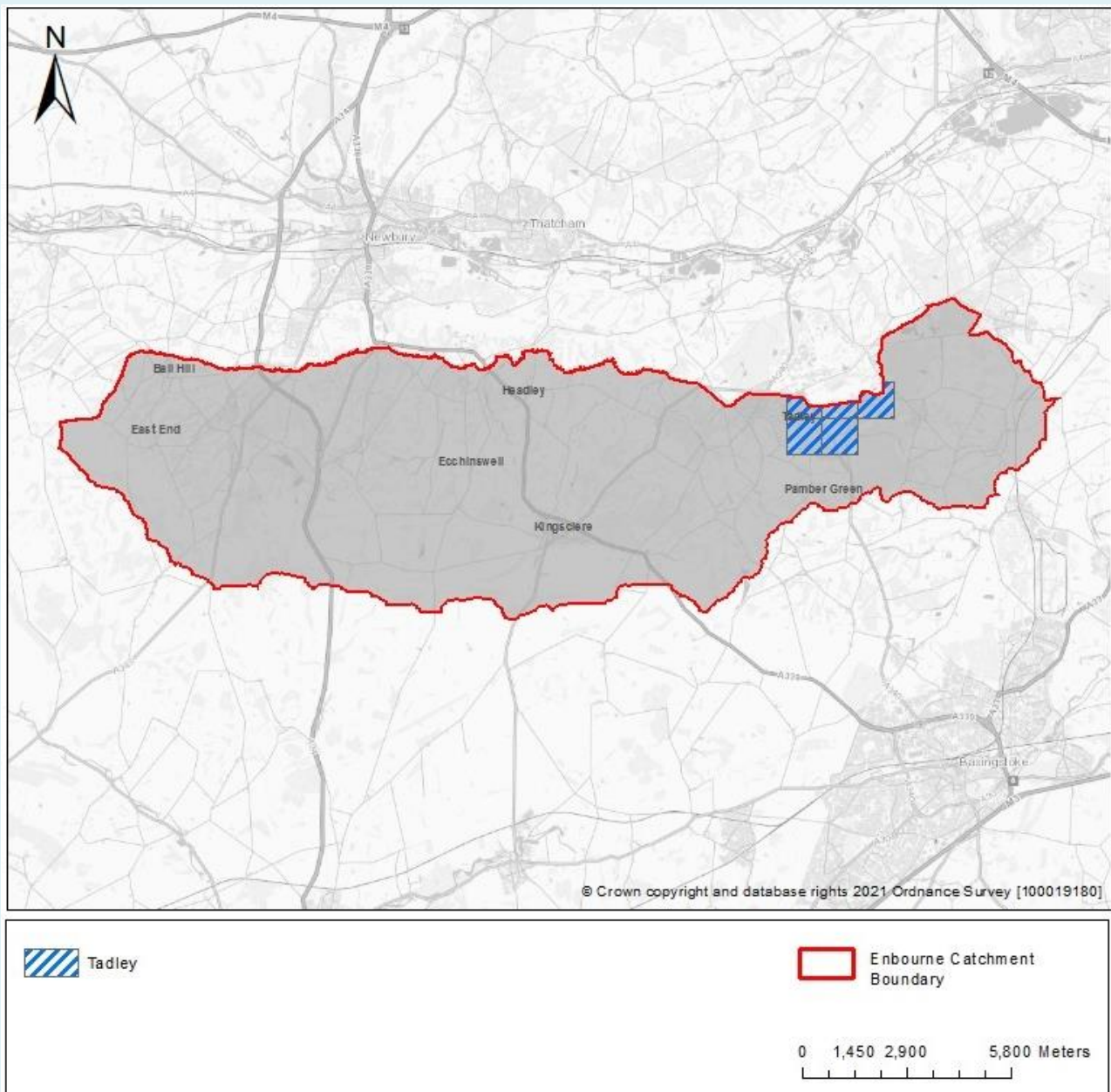


Table 2 – Enbourne Sub Catchments with Priority Groups highlighted*

Group ref.	Group name	Properties at risk of fluvial flooding	Properties at risk of fluvial flooding - Rank	Properties at risk of surface water flooding	Properties at risk of surface water flooding - Rank	Properties at risk of coastal flooding	Properties at risk of groundwater flooding	Properties at risk of groundwater flooding - Rank	Properties at Risk Based on Historical Flooding Events	Deprived residential properties at risk of flooding	Length (m) of strategic roads at risk of flooding	Repair costs (£) of all roads at risk of flooding	Indicative Present Value Damages (£)	Present Value Damages – Rank	Total score	Total score Rank
E.14	Tadley	99	1	5481	1	0	2420	1	4	0	202	£1,500,000	£32,000,000.00	1	2.9	1
E.11	Kingsclere	47	2	1729	2	0	703	3	6	0	921	£1,200,000	£13,100,000.00	2	1.8	2
E.01	Whitway	0	14	155	16	0	166	9	0	0	0	£2,800,000	£2,000,000.00	13	1.5	3
E.05	Woolton Hill	12	5	572	4	0	491	4	0	0	526	£1,000,000	£3,900,000.00	4	1.1	4
E.02	Wash Water	7	8	97	18	0	89	15	0	0	297	£900,000	£1,500,000.00	16	0.7	5
E.15	Baughurst	0	14	573	3	0	920	2	1	0	0	£700,000	£3,200,000.00	6	0.6	6
E.07	Bishop's Green	1	12	146	17	0	90	14	1	0	174	£500,000	£2,600,000.00	9	0.4	7
E.13	Wolverton	0	14	377	6	0	131	12	0	0	192	£300,000	£2,500,000.00	10	0.4	8
E.16	Tadley Hill	0	14	202	13	0	317	5	1	0	117	£400,000	£2,000,000.00	12	0.4	9
E.10	Plastow Green	0	13	411	5	0	73	16	2	0	0	£400,000	£3,100,000.00	8	0.3	10
E.04	Gore End	9	7	298	7	0	253	6	0	0	0	£400,000	£3,300,000.00	5	0.3	11
E.06	Highclere	3	11	208	12	0	246	7	1	0	115	£300,000	£1,400,000.00	17	0.3	12
E.03	East End	0	14	157	15	0	183	8	1	0	0	£500,000	£1,100,000.00	18	0.3	13
E.12	Axmansford	4	10	244	10	0	116	13	0	0	0	£400,000	£2,200,000.00	11	0.3	14
E.17	Silchester	9	6	211	11	0	159	10	2	0	0	£300,000	£1,700,000.00	15	0.3	15
E.18	Mortimer West End	14	3	170	14	0	55	18	1	0	0	£300,000	£3,200,000.00	7	0.2	16
E.09	Ashford Hill	4	9	275	8	0	64	17	1	0	0	£200,000	£5,000,000.00	3	0.2	17
E.08	Ecchinswell	13	4	251	9	0	140	11	0	0	0	£200,000	£2,000,000.00	14	0.2	18

*Groups require a minimum 'Total Score' of 2.0 to be classified as a Priority Group.

Mitigation Measures

Enbourne Catchment Policies

Further to the analysis that has been undertaken as part of this CMP, Hampshire County Council will, in conjunction with the policies laid out in the LFWMS, adopt the following policies to increase flood risk mitigation and improve water management across the Enbourne catchment both now and in the future. Hampshire County Council will:

- Maintain and improve **effective partnership working** that will improve flood resilience within the most vulnerable areas across the Enbourne catchment.
- **Consider Tadley** as a Priority Area in respect of the strategic direction and investment decisions for flood alleviation measures.
- Support, where practicable, only those **new developments planned for areas at low risk of surface water and fluvial flooding** (as defined by the Environment Agency's Risk of Flooding from Surface Water (RoFSW) and Flood Zone maps).
- Support only those developments which offer surface water management systems that ensure all runoff is restricted to **greenfield runoff rates** if the development area is in a greenfield site; or restricted to **pre-existing runoff rates**, with preference to greenfield runoff rates if reasonably practicable, if the development area is in a brownfield site; all in accordance with **best practice and industry standards** (i.e., the SuDS Manual C753) for water quality and quantity. The Priority Areas have different compositions of greenfield and brownfield sites, as seen in Error! Not a valid bookmark self-reference..
- Support only those developments that ensure **flood risk is not increased to surrounding areas** of the Enbourne catchment, with preference made to betterment on the current position where practicable.
- As Lead Local Flood Authority and Highway Authority, the County Council recognises the importance of a collaborative approach to the highway system and continue to monitor at risk locations in line with relevant Highway policies. Potential actions could include monitoring the frequency of maintenance operations, continuing to support the use of lengthsman where possible, and monitoring of road camber and kerb lines to manage surface water flows.

Enbourne Priority Area Policies

In addition to the statements outlined **above**, Hampshire County Council will adopt the following policies to each of the specific Priority Areas highlighted in Error! Reference source not found., according to the risk and need identified in each. Hampshire County Council will:

1. Prioritised Area: Section 19 Policy

In prioritised areas of the Enbourne catchment where reports of past flooding incidents are a cause of particular concern, Hampshire County Council will:

Lower the minimum threshold for triggering a formal flood investigation, under Section 19 of the Flood and Water Management Act 2010, from 20 internally flooded properties to 10.

Section 19 Flood Investigations Reports will be produced in accordance with the requirements of Section 19 of the Flood and Water Management Act 2010 and Hampshire County Council's Flood Investigation Guidance.

2. Prioritised Area: Ordinary Watercourse Policy

In prioritised areas of the Enbourne catchment where land drainage incidents and excessive culverting are a cause for significant concern, Hampshire County Council will:

Implement a more stringent approval process for all Ordinary Watercourse Consent applications.

Each application will be considered on a site-by-site basis where further information and additional requirements may be requested by Hampshire County Council to ensure there will be no increase in flood risk.

3. Prioritised Area: Pre-Application Assessment Policy

In prioritised areas of the Enbourne catchment where significant development is due to take place, Hampshire County Council will:

Make it best practice that a pre-application assessment is sought by the developer for the surface water management features of any proposed development.

This will allow Hampshire County Council to review and provide further recommendations to the developer, during the early stages of the pre-planning process, which will ensure that the development will not increase flood risk in the prioritised area.

4. Prioritised Area: Groundwater Policy

In prioritised areas of the Enbourne catchment where groundwater flooding is a cause of significant concern, Hampshire County Council will:

Ensure that the most up to date and site-specific data pertaining to the risk of groundwater flooding* is used.

Hampshire County Council will ensure that those areas at risk of groundwater flooding are identified, and appropriate levels of assessment and mitigation are proposed and undertaken by developers during the planning and approval process for all proposed developments.

*As detailed in the Groundwater Management Plan for Hampshire

5. Prioritised Area: Maintenance Regime Policy

In prioritised areas of the Enbourne catchment where significant development is due to take place, Hampshire County Council will:

Ensure that the Local Planning Authority only approve new developments that sufficiently demonstrate that a rigorous maintenance regime will be implemented for their surface water management systems.

Developers will be expected to provide maintenance plans setting out maintenance schedules and maintenance responsibilities in line with the latest technical guidance. If adoption is proposed an agreement in principle should also be provided.

6. Prioritised Area: Validation Reports Policy

In prioritised areas of the Enbourne catchment where significant development is due to take place, Hampshire County Council will:

Ensure that the Local Planning Authority requests validation reports from developers when construction is completed.

These reports should contain as built plans and photographs of surface water drainage assets in situ to demonstrate correct construction has taken place. LPAs should also periodically review the construction of surface water management systems on new development to ensure it continues to adhere to best practice and industry standards.

7. Prioritised Area: Brownfield sites Policy

In prioritised areas of the Enbourne catchment where significant brownfield development is due to take place, Hampshire County Council will:

Make it best practice that a 50% betterment of surface water run-off rates is demonstrated for the surface water management features of any proposed development.

This will ensure that developers take on the responsibility to ensure that their new developments do not flood on areas of previously developed land. Also, large areas of impermeable surfaces within new developments will be broken up improving infiltration, increasing biodiversity, and adding to provision of blue/green infrastructure, along with all the multiple benefits this offers.

8. Prioritised Area: Greenfield site Policy

In prioritised areas of the Enbourne catchment where significant greenfield development is due to take place, where surface water management is a cause of significant concern, Hampshire County Council will:

Make it best practise for LPAs to request hydraulic modelling of surface water exceedance flows movement and management on the new development.

This will ensure that developers take on the responsibility to ensure that their new developments do not flood on areas of previously undeveloped land. Also, modelling of exceedance flows will help prevent pooling and flooding of vulnerable areas when a 1 in 100-year plus climate change event is exceeded or in the event of a surface water management system failing.

9. Prioritised Area: Minimum flow Policy

In prioritised areas of the Enbourne catchment where development which requires attenuation on site with restricted outfalls is due to take place, Hampshire County Council will:

Make it best practice for LPAs to request a minimum flow rate of 2l per second from the outfall.

This will ensure that very small diameter pipes are not being used for outfalls which will in turn reduce risk of blockage of said pipes from leaves, branches etc.

10. Prioritised Area: Outfall Policy

In prioritised areas of the Enbourne catchment where development is due to take place on sites where infiltration is not viable either through infiltration rates, groundwater levels and/or policy/best practice restrictions, Hampshire County Council will:

Advise LPAs to refuse any development on sites with no alternative demonstrable outfall.

This will ensure that sites which cannot drain to ground, and which have no demonstrable outfall to a waterbody or agreement in principle to a public sewer connection, will remain undeveloped to reduce the risk of surface water flooding to surrounding areas.

11. Prioritised Area: Limiting Urban Creep

In residential areas of the Enbourne catchment HCC will:

Liaise with the Local Planning Authorities to limit permitted development rights regarding the paving or covering of permeable surfaces with impermeable surfacing to create driveways.

The use of alternative permeable measures such as gravel, grasscrete, permeable paving, etc to form driveways will be encouraged as these measures will fall under permitted development rights. However, those proposing impermeable driveways in Priority Areas will require planning permission. This will help limit the effect of urban creep.

Where the above policies relate to the planning process, discussions will be held with the Local Planning Authorities to determine the best methods for implementing these policies. Possible outcomes could include template planning conditions to be used in the Lead Local Flood Authority responses on drainage consultations and further guidance documents where relevant.

Details on how to apply these policies to specific catchments are shown in **Error! Reference source not found.** below. Error! Not a valid bookmark self-reference. summarise the features found in the Priority Areas, the principal sources of flooding and the impact these sources have on properties and key infrastructure.

The following actions will be undertaken in the priority area within the Enbourne catchment area to create baseline data and basis for future more detailed action plans to be produced in collaboration with partners:

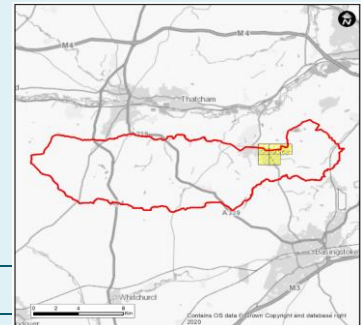
Table 3 – Initial Actions for Priority Areas

No.	Initial Actions	Key Stakeholders
1	<p>Collection and review of all existing site-specific fluvial and surface water flood risk data pertaining to the river(s) flowing through the priority group, as well as groundwater flood risk and historical flood data. The main rivers flowing through the priority group in the Enbourne catchment are the Bishops Wood Stream, the Kiln Pond and the Silchester Brook which flows through the Tadley.</p>	<p>Hampshire County Council Borough/District Councils associated with the priority group (see Table Error! Not a valid bookmark self-reference.) Environment Agency</p>
2	<p>Establish a high-level Flood Action Plan in response to the high fluvial and surface water flood risk for the priority group, this should include a Strategic Drainage Asset Management plan and a Strategic Drainage Plan. These will include in order of preference:</p> <ol style="list-style-type: none"> 1. Natural Flood Management measures 2. Managing surface water within the upper catchment areas 3. Managing surface water through the catchment by retrofitting sustainable drainage systems 4. Provision of hard engineering measures 	<p>Local communities in the Enbourne catchment Thames Water Environment Agency Borough/District Councils associated with the priority group Hampshire County Council Other relevant stakeholders associated with the priority group (see Table Error! Not a valid bookmark self-reference.)</p>
3	<p>Strategic Drainage Asset Management Plan (managing existing assets)</p> <ul style="list-style-type: none"> • Natural flood risk management measures, this includes identifying and then developing a strategic inspection and community-led maintenance procedure of all existing natural drainage assets (drainage ditches, swales etc.) that likely convey surface water runoff into the river(s) flowing through the priority group. • Managing surface water within the upper catchment areas. Management measures may include inspection and maintenance of all existing drainage assets (ditches, drainage ponds, attenuation tanks etc.), minor landscaping works to attenuate flow, provision of woody dams, or sustainable drainage systems. • Regular inspection (CCTV surveys or other methods as identified by the Highway Authority) of drainage/pipework and maintenance of the strategic road routes at risk of flooding for each priority group. Repairs applied where necessary. • Regular inspection (CCTV surveys or other methods as identified by associated water companies) of existing surface and foul sewerage located in areas at high risk of surface water flooding for the priority group. Repairs applied where necessary. 	<p>Local communities in the Enbourne catchment Thames Water Environment Agency Borough/District Councils associated with the priority group Hampshire County Council Other relevant stakeholders associated with the priority group (see Table Error! Not a valid bookmark self-reference.) Highway Authority</p>
4	<p>Strategic drainage plan (creation of new assets)</p> <ul style="list-style-type: none"> • Managing surface water within the upper catchment areas- minor landscaping works to attenuate flow, provision of woody dams, or sustainable drainage systems. 	<p>Local communities in the Enbourne catchment Thames Water</p>

<ul style="list-style-type: none"> • Managing surface water through the catchment by retrofitting sustainable drainage systems into the built environment, such as ponds, swales, or permeable paving systems; and • Provision of hard engineering measures such as flood defence walls, embankments and structures if considered necessary. 	<p>Environment Agency Borough/District Councils associated with the priority group Hampshire County Council Other relevant stakeholders associated with the priority group (see Table Error! Not a valid bookmark self-reference.)</p>
<p>5 Detailed review and selection of the mitigation measures to be implemented as part of the Flood Action Plan for the priority group, with preference to lower cost simpler measures that can be undertaken by local groups before other measures. Further surveys, such as drainage, topographic and/or LiDAR surveys, followed by flood risk modelling work if considered appropriate, may be undertaken to support the review and selection process.</p>	<p>Hampshire County Council Borough/District Councils associated with the priority group (see Table Error! Not a valid bookmark self-reference.)</p>

TABLE 4 – PRIORITY GROUP 1 – Tadley

Below is a summary table of the characteristics and flood risk of priority group 1 – Tadley



Feature	Description / Value
Group Name	Tadley
Location	Easting: 459500, Northing: 161500 Located in the northeast of the Enbourne Catchment, encompassing Tadley town centre.
Area	5km ²
Number of residential properties within RoFSW	5481
Number of residential properties within Flood Zones	99
Number of residential properties at risk of groundwater flooding	2420
Infrastructure at risk	202m of strategic road routes at risk of flooding. The main strategic roads at risk of flooding are the B3051 and A340.
Principal Flood Risk Source	Principal flood risk sources are surface water, groundwater and fluvial flooding associated with the Bishops Wood Stream and Silchester Brook. Groundwater flooding is prominent and assessed as high risk in the Tadley area. The Bishops Wood Stream and Silchester Brook flow through the sub-catchment, leading to localised fluvial flood risk (Flood Zone 3 with localised Flood Zone 2) to properties and businesses adjacent to the watercourses. Receptors at risk of fluvial flooding include residential properties, sections of the A340, greenspace and farmland in Tadley Bottom and a convenience store. Risk of surface water flooding ranges from low to high (0.1% to over 3.3% AEP) throughout Tadley, primarily impacting properties and road networks adjacent to the watercourses. Overland flow routes form throughout the town, primarily along the road networks. Surface water in these areas varies in depth from 300 to over 900mm. Receptors at risk include businesses and residential properties, a junior school, and a pharmacy. Road networks at risk include the B3051 and A340 and minor roads, including New Road, Rowan Road and Swains Road.
Borough Council	Basingstoke and Deane Borough Council, and West Berkshire Council
Relevant Stakeholders	Tadley Civil Parish, Aldermaston Civil Parish and Pamber Civil Parish
Notable Brownfield Sites (including site reference)	Unit 1 at Falcon Garage, Tadley (CR10)

Action Plans

A **stepped approach to interventions and measures** to reduce flood risk within the catchment, following the Natural Flood Risk Management Hierarchy, will be captured within Action Plans for each of the Priority Areas.

By recognising the key sources of flooding, the Action Plans will encourage **more effective work between partners** within each priority area to develop appropriate flood risk mitigation strategies. This will also empower **residents and communities** to take action to mitigate flooding and the County Council will support an approach that considers the implementation of lower cost, simpler measures at the local level first.

The Action Plans will develop short, medium, and long-term approaches to managing flood risk, taking into account the short, medium and long term impacts of flood risk, and will be set up with the input of an active working group comprising the relevant key stakeholders included in Table *

Group ref.	Group name	Properties at risk of fluvial flooding	Properties at risk of fluvial flooding - Rank	Properties at risk of surface water flooding	Properties at risk of surface water flooding - Rank	Properties at risk of coastal flooding	Properties at risk of groundwater flooding	Properties at risk of groundwater flooding - Rank	Properties at Risk Based on Historical Flooding Events	Deprived residential properties at risk of flooding	Length (m) of strategic roads at risk of flooding	Repair costs (£) of all roads at risk of flooding	Indicative Present Value Damages (£)	Present Value Damages – Rank	Total score	Total score Rank
E.14	Tadley	99	1	5481	1	0	2420	1	4	0	202	£1,500,000	£32,000,000.00	1	2.9	1
E.11	Kingsclere	47	2	1729	2	0	703	3	6	0	921	£1,200,000	£13,100,000.00	2	1.8	2
E.01	Whitway	0	14	155	16	0	166	9	0	0	0	£2,800,000	£2,000,000.00	13	1.5	3
E.05	Woolton Hill	12	5	572	4	0	491	4	0	0	526	£1,000,000	£3,900,000.00	4	1.1	4
E.02	Wash Water	7	8	97	18	0	89	15	0	0	297	£900,000	£1,500,000.00	16	0.7	5
E.15	Baughurst	0	14	573	3	0	920	2	1	0	0	£700,000	£3,200,000.00	6	0.6	6
E.07	Bishop's Green	1	12	146	17	0	90	14	1	0	174	£500,000	£2,600,000.00	9	0.4	7
E.13	Wolverton	0	14	377	6	0	131	12	0	0	192	£300,000	£2,500,000.00	10	0.4	8
E.16	Tadley Hill	0	14	202	13	0	317	5	1	0	117	£400,000	£2,000,000.00	12	0.4	9
E.10	Plastow Green	0	13	411	5	0	73	16	2	0	0	£400,000	£3,100,000.00	8	0.3	10
E.04	Gore End	9	7	298	7	0	253	6	0	0	0	£400,000	£3,300,000.00	5	0.3	11
E.06	Highclere	3	11	208	12	0	246	7	1	0	115	£300,000	£1,400,000.00	17	0.3	12
E.03	East End	0	14	157	15	0	183	8	1	0	0	£500,000	£1,100,000.00	18	0.3	13
E.12	Axmansford	4	10	244	10	0	116	13	0	0	0	£400,000	£2,200,000.00	11	0.3	14
E.17	Silchester	9	6	211	11	0	159	10	2	0	0	£300,000	£1,700,000.00	15	0.3	15
E.18	Mortimer West End	14	3	170	14	0	55	18	1	0	0	£300,000	£3,200,000.00	7	0.2	16
E.09	Ashford Hill	4	9	275	8	0	64	17	1	0	0	£200,000	£5,000,000.00	3	0.2	17
E.08	Ecchinswell	13	4	251	9	0	140	11	0	0	0	£200,000	£2,000,000.00	14	0.2	18

*Groups require a minimum 'Total Score' of 2.0 to be classified as a Priority Group.

Mitigation Measures

Enbourne Catchment Policies

Further to the analysis that has been undertaken as part of this CMP, Hampshire County Council will, in conjunction with the policies laid out in the LFWMS, adopt the following policies to increase flood risk mitigation and improve water management across the Enbourne catchment both now and in the future. Hampshire County Council will:

- Maintain and improve **effective partnership working** that will improve flood resilience within the most vulnerable areas across the Enbourne catchment.
- **Consider Tadley** as a Priority Area in respect of the strategic direction and investment decisions for flood alleviation measures.
- Support, where practicable, only those **new developments planned for areas at low risk of surface water and fluvial flooding** (as defined by the Environment Agency's Risk of Flooding from Surface Water (RoFSW) and Flood Zone maps).
- Support only those developments which offer surface water management systems that ensure all runoff is restricted to **greenfield runoff rates** if the development area is in a greenfield site; or restricted to **pre-existing runoff rates**, with preference to greenfield runoff rates if reasonably practicable, if the development area is in a brownfield site; all in accordance with **best practice and industry standards** (i.e., the SuDS Manual C753) for water quality and quantity. The Priority Areas have different compositions of greenfield and brownfield sites, as seen in Error! Not a valid bookmark self-reference..
- Support only those developments that ensure **flood risk is not increased to surrounding areas** of the Enbourne catchment, with preference made to betterment on the current position where practicable.
- As Lead Local Flood Authority and Highway Authority, the County Council recognises the importance of a collaborative approach to the highway system and continue to monitor at risk locations in line with relevant Highway policies. Potential actions could include monitoring the frequency of maintenance operations, continuing to support the use of lengthsman where possible, and monitoring of road camber and kerb lines to manage surface water flows.

Enbourne Priority Area Policies

In addition to the statements outlined **above**, Hampshire County Council will adopt the following policies to each of the specific Priority Areas highlighted in Error! Reference source not found., according to the risk and need identified in each. Hampshire County Council will:

11. Prioritised Area: Section 19 Policy

In prioritised areas of the Enbourne catchment where reports of past flooding incidents are a cause of particular concern, Hampshire County Council will:

Lower the minimum threshold for triggering a formal flood investigation, under Section 19 of the Flood and Water Management Act 2010, from 20 internally flooded properties to 10.

Section 19 Flood Investigations Reports will be produced in accordance with the requirements of Section 19 of the Flood and Water Management Act 2010 and Hampshire County Council's Flood Investigation Guidance.

12. Prioritised Area: Ordinary Watercourse Policy

In prioritised areas of the Enbourne catchment where land drainage incidents and excessive culverting are a cause for significant concern, Hampshire County Council will:

Implement a more stringent approval process for all Ordinary Watercourse Consent applications.

Each application will be considered on a site-by-site basis where further information and additional requirements may be requested by Hampshire County Council to ensure there will be no increase in flood risk.

13. Prioritised Area: Pre-Application Assessment Policy

In prioritised areas of the Enbourne catchment where significant development is due to take place, Hampshire County Council will:

Make it best practice that a pre-application assessment is sought by the developer for the surface water management features of any proposed development.

This will allow Hampshire County Council to review and provide further recommendations to the developer, during the early stages of the pre-planning process, which will ensure that the development will not increase flood risk in the prioritised area.

14. Prioritised Area: Groundwater Policy

In prioritised areas of the Enbourne catchment where groundwater flooding is a cause of significant concern, Hampshire County Council will:

Ensure that the most up to date and site-specific data pertaining to the risk of groundwater flooding* is used.

Hampshire County Council will ensure that those areas at risk of groundwater flooding are identified, and appropriate levels of assessment and mitigation are proposed and undertaken by developers during the planning and approval process for all proposed developments.

*As detailed in the Groundwater Management Plan for Hampshire

15. Prioritised Area: Maintenance Regime Policy

In prioritised areas of the Enbourne catchment where significant development is due to take place, Hampshire County Council will:

Ensure that the Local Planning Authority only approve new developments that sufficiently demonstrate that a rigorous maintenance regime will be implemented for their surface water management systems.

Developers will be expected to provide maintenance plans setting out maintenance schedules and maintenance responsibilities in line with the latest technical guidance. If adoption is proposed an agreement in principle should also be provided.

16. Prioritised Area: Validation Reports Policy

In prioritised areas of the Enbourne catchment where significant development is due to take place, Hampshire County Council will:

Ensure that the Local Planning Authority requests validation reports from developers when construction is completed.

These reports should contain as built plans and photographs of surface water drainage assets in situ to demonstrate correct construction has taken place. LPAs should also periodically review the construction of surface water management systems on new development to ensure it continues to adhere to best practice and industry standards.

17. Prioritised Area: Brownfield sites Policy

In prioritised areas of the Enbourne catchment where significant brownfield development is due to take place, Hampshire County Council will:

Make it best practice that a 50% betterment of surface water run-off rates is demonstrated for the surface water management features of any proposed development.

This will ensure that developers take on the responsibility to ensure that their new developments do not flood on areas of previously developed land. Also, large areas of impermeable surfaces within new developments will be broken up improving infiltration, increasing biodiversity, and adding to provision of blue/green infrastructure, along with all the multiple benefits this offers.

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In prioritised areas of the Enbourne catchment where significant greenfield development is due to take place, where surface water management is a cause of significant concern, Hampshire County Council will:

Make it best practise for LPAs to request hydraulic modelling of surface water exceedance flows movement and management on the new development.

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In prioritised areas of the Enbourne catchment where development which requires attenuation on site with restricted outfalls is due to take place, Hampshire County Council will:

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This will ensure that very small diameter pipes are not being used for outfalls which will in turn reduce risk of blockage of said pipes from leaves, branches etc.

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This will ensure that sites which cannot drain to ground, and which have no demonstrable outfall to a waterbody or agreement in principle to a public sewer connection, will remain undeveloped to reduce the risk of surface water flooding to surrounding areas.

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In residential areas of the Enbourne catchment HCC will:

Liaise with the Local Planning Authorities to limit permitted development rights regarding the paving or covering of permeable surfaces with impermeable surfacing to create driveways.

The use of alternative permeable measures such as gravel, grasscrete, permeable paving, etc to form driveways will be encouraged as these measures will fall under permitted development rights. However, those proposing impermeable driveways in Priority Areas will require planning permission. This will help limit the effect of urban creep.

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Details on how to apply these policies to specific catchments are shown in **Error! Reference source not found.** below. Error! Not a valid bookmark self-reference. summarise the features found in the Priority Areas, the principal sources of flooding and the impact these sources have on properties and key infrastructure.

The following actions will be undertaken in the priority area within the Enbourne catchment area to create baseline data and basis for future more detailed action plans to be produced in collaboration with partners:

Table 3 – Initial Actions for Priority Areas

No.	Initial Actions	Key Stakeholders
1	<p>Collection and review of all existing site-specific fluvial and surface water flood risk data pertaining to the river(s) flowing through the priority group, as well as groundwater flood risk and historical flood data. The main rivers flowing through the priority group in the Enbourne catchment are the Bishops Wood Stream, the Kiln Pond and the Silchester Brook which flows through the Tadley.</p>	<p>Hampshire County Council Borough/District Councils associated with the priority group (see Table Error! Not a valid bookmark self-reference.) Environment Agency</p>
2	<p>Establish a high-level Flood Action Plan in response to the high fluvial and surface water flood risk for the priority group, this should include a Strategic Drainage Asset Management plan and a Strategic Drainage Plan. These will include in order of preference:</p> <ol style="list-style-type: none"> 5. Natural Flood Management measures 6. Managing surface water within the upper catchment areas 7. Managing surface water through the catchment by retrofitting sustainable drainage systems 8. Provision of hard engineering measures 	<p>Local communities in the Enbourne catchment Thames Water Environment Agency Borough/District Councils associated with the priority group Hampshire County Council Other relevant stakeholders associated with the priority group (see Table Error! Not a valid bookmark self-reference.)</p>
3	<p>Strategic Drainage Asset Management Plan (managing existing assets)</p> <ul style="list-style-type: none"> • Natural flood risk management measures, this includes identifying and then developing a strategic inspection and community-led maintenance procedure of all existing natural drainage assets (drainage ditches, swales etc.) that likely convey surface water runoff into the river(s) flowing through the priority group. • Managing surface water within the upper catchment areas. Management measures may include inspection and maintenance of all existing drainage assets (ditches, drainage ponds, attenuation tanks etc.), minor landscaping works to attenuate flow, provision of woody dams, or sustainable drainage systems. • Regular inspection (CCTV surveys or other methods as identified by the Highway Authority) of drainage/pipework and maintenance of the strategic road routes at risk of flooding for each priority group. Repairs applied where necessary. • Regular inspection (CCTV surveys or other methods as identified by associated water companies) of existing surface and foul sewerage located in areas at high risk of surface water flooding for the priority group. Repairs applied where necessary. 	<p>Local communities in the Enbourne catchment Thames Water Environment Agency Borough/District Councils associated with the priority group Hampshire County Council Other relevant stakeholders associated with the priority group (see Table Error! Not a valid bookmark self-reference.) Highway Authority</p>
4	<p>Strategic drainage plan (creation of new assets)</p> <ul style="list-style-type: none"> • Managing surface water within the upper catchment areas- minor landscaping works to attenuate flow, provision of woody dams, or sustainable drainage systems. 	<p>Local communities in the Enbourne catchment Thames Water</p>

<ul style="list-style-type: none"> • Managing surface water through the catchment by retrofitting sustainable drainage systems into the built environment, such as ponds, swales, or permeable paving systems; and • Provision of hard engineering measures such as flood defence walls, embankments and structures if considered necessary. 	<p>Environment Agency Borough/District Councils associated with the priority group Hampshire County Council Other relevant stakeholders associated with the priority group (see Table Error! Not a valid bookmark self-reference.)</p>
<p>5 Detailed review and selection of the mitigation measures to be implemented as part of the Flood Action Plan for the priority group, with preference to lower cost simpler measures that can be undertaken by local groups before other measures. Further surveys, such as drainage, topographic and/or LiDAR surveys, followed by flood risk modelling work if considered appropriate, may be undertaken to support the review and selection process.</p>	<p>Hampshire County Council Borough/District Councils associated with the priority group (see Table Error! Not a valid bookmark self-reference.)</p>

TABLE 4 – PRIORITY GROUP 1 – Tadley

Below is a summary table of the characteristics and flood risk of priority group 1 – Tadley above.

Measures in the Action Plans may include the development of flood action groups, property level protection, community maintenance schemes as well as small to larger scale alleviation works if considered necessary.

Figure 13 – Natural Flood Management Hierarchy

Natural flood management hierarchy

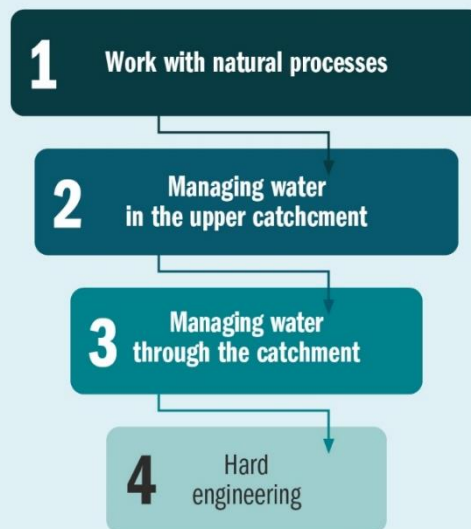


Table 5 – Natural Flood Risk Management Hierarchy

Steps	Description	Example Details
1	Working with natural processes	Changing or altering management techniques
2	Managing water within the upper catchment areas	Attenuation and woody dams
3	Managing water through the catchment	Sustainable drainage systems, vegetation growth
4	Hard engineering measures	Flood defence walls/embankments and structures.

Conclusions

The Enbourne CMP aims to support a more holistic and co-ordinated approach to flood risk mitigation and water management within communities that are at an increased risk of flooding. By adapting the Hampshire Catchment Prioritisation Tool to the Enbourne catchment area, 1 location has been selected as priority areas.

This area is: Tadley (affected by fluvial, groundwater and surface water flooding).

Flooding within this priority area comes from a number of sources. The interaction of these sources is hugely important to identify measures that can help manage the risk as a whole. Further investigations and surveys, followed by hydraulic modelling, where appropriate, may be required for the priority area as part of the development of an effective Action Plan.

This Action Plans will be developed by further assessing the nature, cause, and effect of flooding for the priority area. The Action Plan will include mitigation measures that seek to reduce the risk of flooding within the group and will be monitored and reviewed on a regular basis.

Appendix 1- Data

As part of the CMP, existing asset and flood risk data directly related to the Enbourne catchment area was sourced and reviewed. The datasets represent properties and road assets located within the area, as well as flood risk from different sources of flooding, and records of historic flooding. The datasets used as part of this assessment are presented in the table below.

Table 6- Datasets used to develop the Enbourne Catchment Plan

Dataset Name	Description	Source/Owner
Hampshire historic flooding	Record of historic flooding in Hampshire.	Hampshire County Council
Priority Salt Route	Strategic road network within Enbourne and Hampshire	Hampshire County Council
OS MasterMap topographic layer	Topographic map of the United Kingdom	Ordnance Survey
OS Open Roads	Road Network for the United Kingdom.	Ordnance Survey
Lower super output areas (LSOA)	Areas used to report national statistics, LSOAs contain 400 to 1200 households each	Office for National Statistics
Indices of multiple deprivation	Deprivation score for each LSOA area in England, based on number of indicators, chosen to cover a range of economic, social, and housing issues	Office for National Statistics
Multi-Coloured Manual (MCM)	Flood and Coastal Erosion Risk Management: A Manual for Economic Appraisal	Flood Hazard Research Centre
National receptor database (NRD)	A dataset that contains (among other things) the location of each property in England and Wales	Environment Agency
Flood map for planning	Flood risk from rivers and sea (Flood Zones 2 and 3)	Environment Agency
Risk of flooding from surface water	Indication of the broad areas likely to be at risk of surface water flooding	Environment Agency
Detailed River Network (DRN)	Dataset depicting river centrelines within the UK	Environment Agency
Susceptibility to groundwater flooding	Identifies areas where geological conditions could enable groundwater flooding to occur.	British Geological Society
Strategic Flood Risk Assessments	An overview of all sources of flood risk throughout the districts.	Councils: Eastleigh, East Hampshire District, Gosport, Havant, and Winchester City

Appendix 2- Prioritisation Methodology

Methodology

The Hampshire catchment prioritisation tool is a GIS based multi criteria analysis tool. A set of nine criteria was considered to assess the risk and impact of flooding at a strategic level. A description of each criterion is summarised in the table below. Further details on the approach can be found in the Hampshire Catchment Prioritisation Tool report (Doc ref: 5151452-ATK-00-XX-RP-G-0002), 26 January 2017.

Table 7- Criteria used in the Hampshire Catchment Prioritisation tool

ID	Name	Count	Data Source
1	Properties at risk of fluvial flooding	Counts of properties at risk of fluvial flooding	Flood map for planning Ordnance Survey (OS) MasterMap National Receptor Database
2	Properties at risk of surface water flooding	Counts of properties at risk of surface water flooding	Risk of flooding from surface water (RoFSW) OS MasterMap National Receptor Database
3	Properties at risk of coastal flooding	Counts of properties at risk of coastal flooding	As per criterion 1
4	Properties at risk of groundwater flooding	Counts of properties at risk of groundwater flooding	Susceptibility to groundwater flooding OS MasterMap National Receptor Database
5	Historic flooding	Counts of records with historic evidence of flooding	Hampshire historic flooding
6	Areas of deprivation, 20% and 40% most deprived	Count of deprived residential properties at risk of fluvial / surface water or coastal flooding	All flood sources (excl. groundwater) OS MasterMap National Receptor Database Index of Multiple Deprivation Lower Super Output Areas
7	Strategic Road Network at risk from flooding	Length (m) of strategic roads at risk of fluvial / surface water or coastal flooding	All flood sources (excl. groundwater) Priority Salt Route OS Open Roads
8	Road Repair costs	Repair costs (£) of all roads at risk of flooding	All flood sources (excl. groundwater) OS Open Roads
9	Present Value (PV) Damages	Count of residential properties at risk of fluvial / surface water or coastal flooding	All flood sources (excl. groundwater) OS MasterMap National Receptor Database MCM Manual

The assessment was based on a 1 km x 1 km square grid taken from the 2017 Hampshire catchment study and applied within the Enbourne catchment. Each grid square has been given a unique index value based on its vertical and horizontal position within the grid. For each criterion, a score representing the level of impact on a

grid square was assigned. Each score was then summed together to indicate the total impact that all sources of flooding have on all the properties, transportation, and other infrastructure assets within the grid square. These scores were thereafter ranked in descending order of total scores, with the lowest rank representing the highest priority. Groups with a total score of 2.0 or higher were then selected as Catchment Priority Areas. This ensured a fair comparison of risk across catchments, while only applying that Catchment Priority Area status to the groups with the most risk and where measures could be most easily justified.

The existing plans, historic flood risk, and policies have been reviewed as part of this assessment, to help inform the selection of priority communities. In addition, the latest Ordnance Survey (OS) building MasterMap and the most up-to-date EA flooding outlines (Flood Zones and RoFSW) have been compared with the data used for the Hampshire assessment (2017). No significant differences have been found with the assessment in 2017.

For the Enbourne catchment, grid squares ranked 168 or higher were immediately excluded as the risk of flooding within these areas were categorised as too low for further consideration. The remaining grid squares were subsequently grouped together, where considered appropriate, based on the following criteria:

- Similar location (e.g., small village in a rural area, or same neighbourhood in a city).
- Similar flooding source (e.g., same river branch or surface water flow path); and
- Similar total scores.

In conjunction with the above, the following exclusion criteria has also been applied to consolidate the total number of groups for this catchment:

- Any ungrouped residual grid squares ranked 93 or above have been excluded.
- All other groups comprising more than two grid squares have been retained.

Limitations and Assumptions

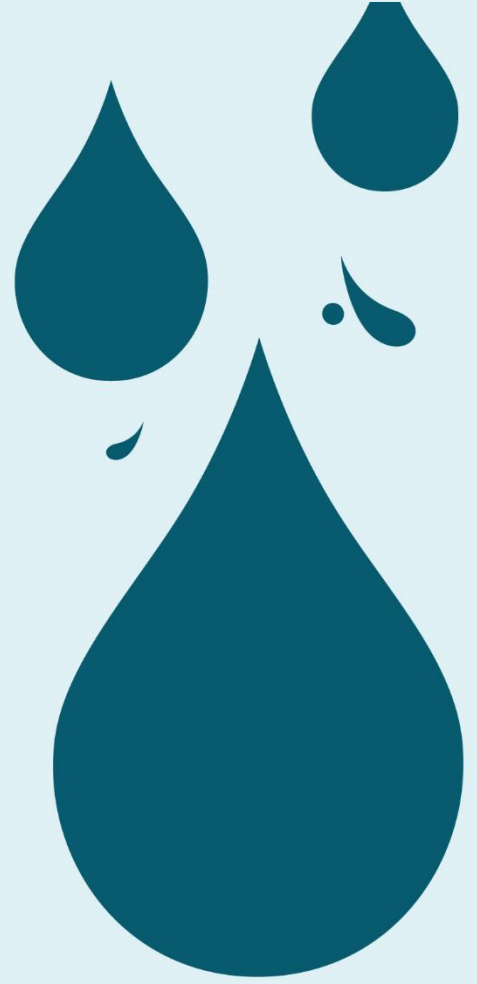
It should be noted that this approach is subject to the following limitations:

- All data located outside of the Enbourne catchment boundary has been excluded as part of this assessment. Hence all 1km x 1km grid squares along the boundary that contain areas that partially reside outside of this boundary will have all datasets related to that area excluded. This will result in a number of grid squares that will be ranked lower than they otherwise would be if all data pertaining to the entire associated area were to be included; and
- Ranking of each grid square is dependent on the weighting and risk factors that are applied to each criterion. The weights and risk factors were agreed in the 2017 Hampshire study.

Document Review Period

This document should be reviewed every 3 years in terms of changes in flood risk and legislative / best practice updates or sooner if major flooding identifies additional key areas at risk.

Atkins Limited
Atkins the Hub
500 Park Avenue
Almondsbury
Bristol
BS32 44Z



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