

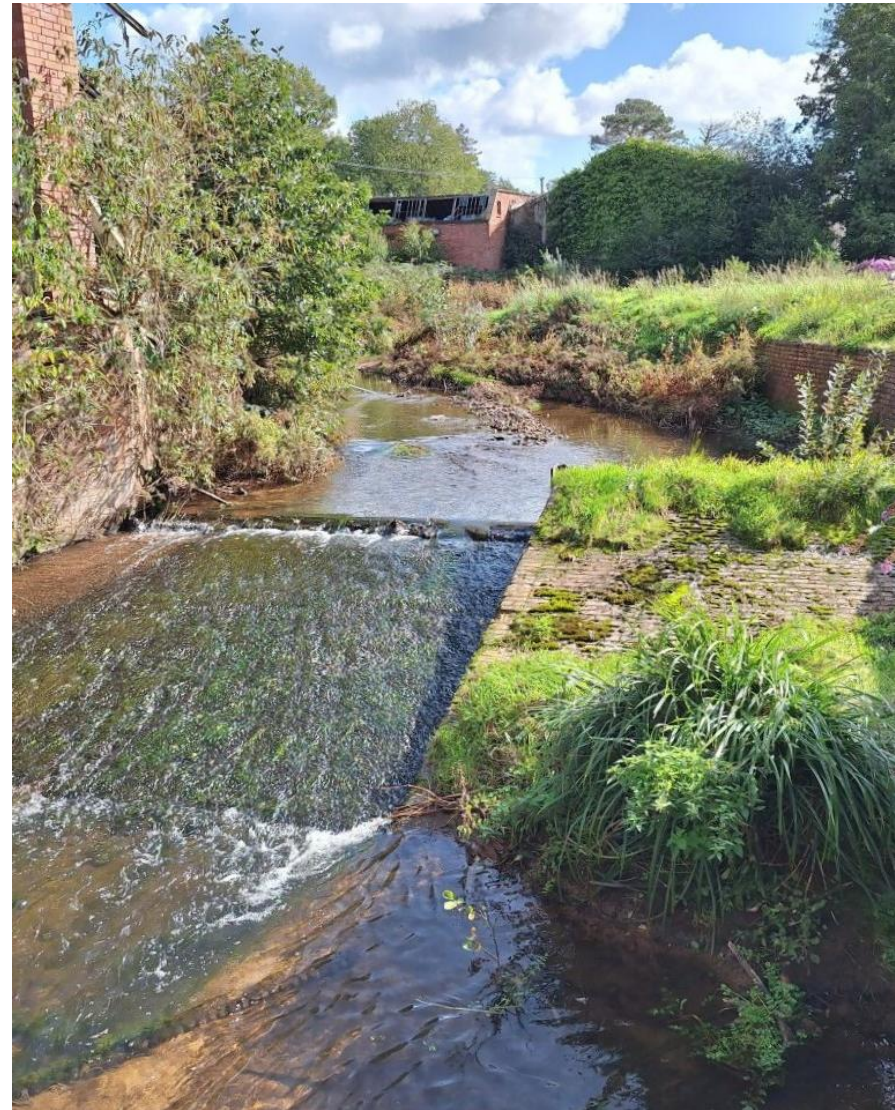
**Somerset Council**

# Wellington Waterways Feasibility Study (WWFS)

## Consultation Booklet

Produced to inform Public Consultation and seek feedback on the development of the Study. Further detail will be provided in a Feasibility Report published following consultation.

05 February 2024



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# 1. Introduction and context

## 1.1 Introduction

Somerset Council have decided to undertake the Wellington Waterways Feasibility Study (WWFS), to establish a vision for reducing flood risk to key heritage assets of Tonedale, as well as to deliver wider benefits for nature and the community around Wellington.

This study is multi-disciplinary and will inform future funding and investment decisions to deliver a broad range of benefits to the Somerset Levels and Moors and other community objectives across the wider catchment area along the River Tone and its tributary, the Back Stream.

The focus of the Study will be on the key heritage assets; Tonedale Mill (Figure 1) and Tone Works (Figure 2). These two mill complexes are interlinked and located within 500m of each other, on the north-west side of Wellington, Somerset. These assets are significant due to their associated historic water management infrastructure and history as the headquarters of Fox Brothers & Co. Ltd., producers of woollen and worsted fabrics. It is considered that the company and its employment have been central to the development of Wellington as a town.



Figure 1. Photographs of Tonedale Mill

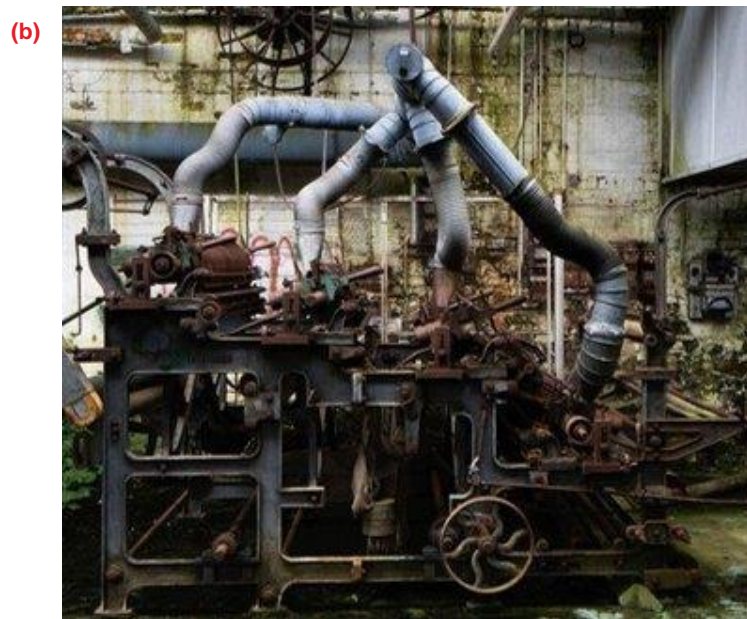


Figure 2. Photographs of Tone Works (a) aerial image (Keanu Drone, 2020), and (b) exceptional machinery (Claire Fear, 2023), and (c) comprehensive structures.

The buildings at both sites contain features associated with water management which extend into the wider landscape. Throughout industrial history of the sites, the natural watercourses were modified and adapted to serve the increasing requirements for water as power and for numerous factory process (see Figure 2b). While these water management systems allowed a reliable flow of water from Wellington Basins (“the Basins”, Figure 3) located upstream of Tonedale Mill during fluctuations in river levels, the location of both sites and the implications of the existing water management systems (Figure 4) has resulted in both these assets being at risk of significant flooding.





Figure 3. Wellington Basins.



Figure 4. Weir at the top of the leat at Wellington Basins.

As such, this Study aims to understand the potential options for reducing flood risk to these key heritage assets, as well as the wider catchment. Opportunities have also been considered as to how the Study can provide wider benefits such as historic, landscape and ecological enhancements.

## 1.2 Purpose of this booklet

The purpose of this booklet is to provide you with an overview of what has happened on the Study to date which will help to inform your feedback to our public consultation. Your feedback provided as part of this Public Consultation will be integral to the development of this Study. This Public Consultation is an essential component to ensuring successful outcomes of this project and its approach to collaborative working. The feedback you provide will be analysed, reviewed and considered by our project team to help them finalise the Study, contributing to an imaginative and ambitious plan that sets out how the waterways function today and principally, the opportunities for reducing flood risk and providing innovative enhancements to the historic, landscape and ecological context.

This booklet contains details of what has already been delivered as part of this study, this includes:

- Baseline Assessment: understanding the site with respect to flood risk, ecology, planning, heritage, amenity and access, and wider benefits;
- Options Appraisal: An evaluation of a list of options to reduce flood risk, whilst identifying opportunities across the site to deliver wider environmental and social enhancements; and
- The establishment of a preferred flood risk management approach and potential wider opportunities which could be taken forward to contribute to establishing a vision for the area.

### **1.3 Collaboration and Engagement**

As there are a wide range of interests and issues which are relevant to this Study, positive working relationships and understanding between stakeholders, interest groups and the project team are considered critical to the successful delivery of the Study's aim.

This Study's approach to collaboration and engagement has identified a number of stakeholders from the community and organisations for participation and invited them to collaborate with the project team to provide their insights and influence the Study outcomes. The feedback received from these stakeholders has been considered and where relevant reflected within the Study's deliverables, including the development of the preferred approach, as set out within this report.

Collaboration with these individuals and organisations has been achieved through a combination of:

- Steering Group meetings;
- Community Forums; and
- 'Deep Dive' discussions.

The Steering Group includes representatives from organisations such as the Environment Agency, Historic England, Natural England and Somerset Wildlife Trust. The Steering Group discusses the project in a collaborative setting, sharing ideas and learnings, to make decisions about the Study and agree on next steps.

The Community Forums involve a wide range of individuals and organisations representing a various interest relevant to the Study. Community Forums are in-person events where members are invited to discuss, review, and provide their feedback through interactive activities about the Study.

The 'Deep Dive' discussions are with technical specialists and are used to elaborate on specific topics. These discussions may be arranged to answer key questions or issues raised by the Community Forum or the Steering Group, and to discuss the detail of any issues or opportunities raised, such as the management and modelling of watercourses.

### **1.4 Timeline of the Study**

Figure 5 illustrates the timeline of collaborative events that inform the development of the Study.

### **1.5 The Study**

As part of this study, the town of Wellington and its surroundings areas have been considered. This is to allow for the consideration and encompassment of a range of assets, constraints and opportunities that may be feasible in the immediate areas of Tone Works and Tonedale Mill or in the wider catchment (Figures 6 and 7). The project team, which includes technical specialists, have used their expert judgement to define specific areas of assessment to allow for the reporting of evidence and the development of options.

The following sections present the context of the study, the overarching objective, the approach to the options appraisal and the presentation of the preferred approach to be taken forward.

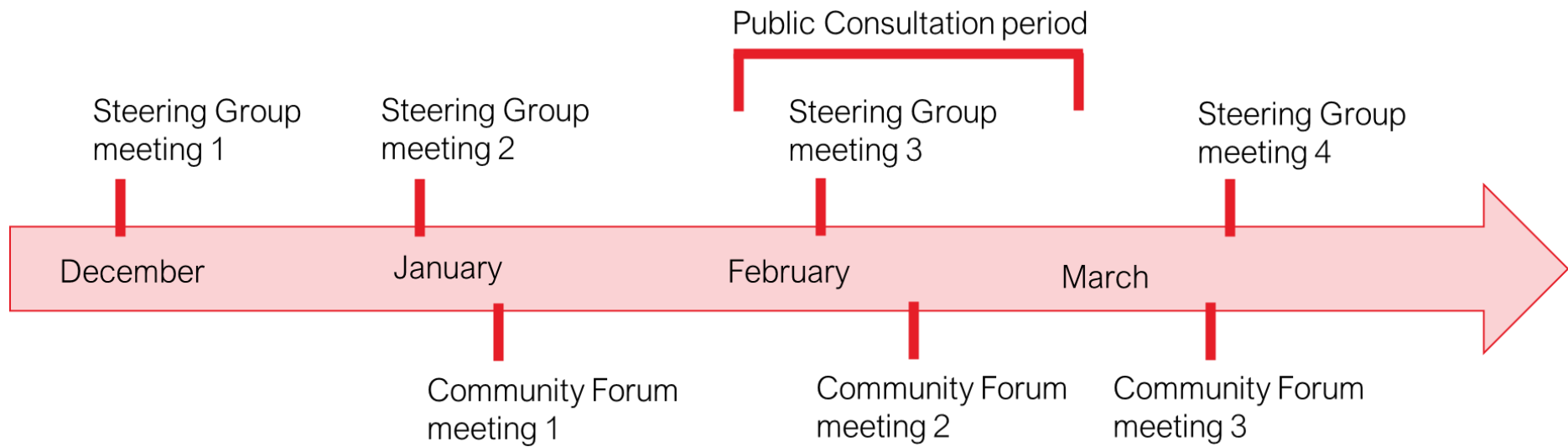


Figure 5. Timeline of collaborative meetings on Wellington Waterways.

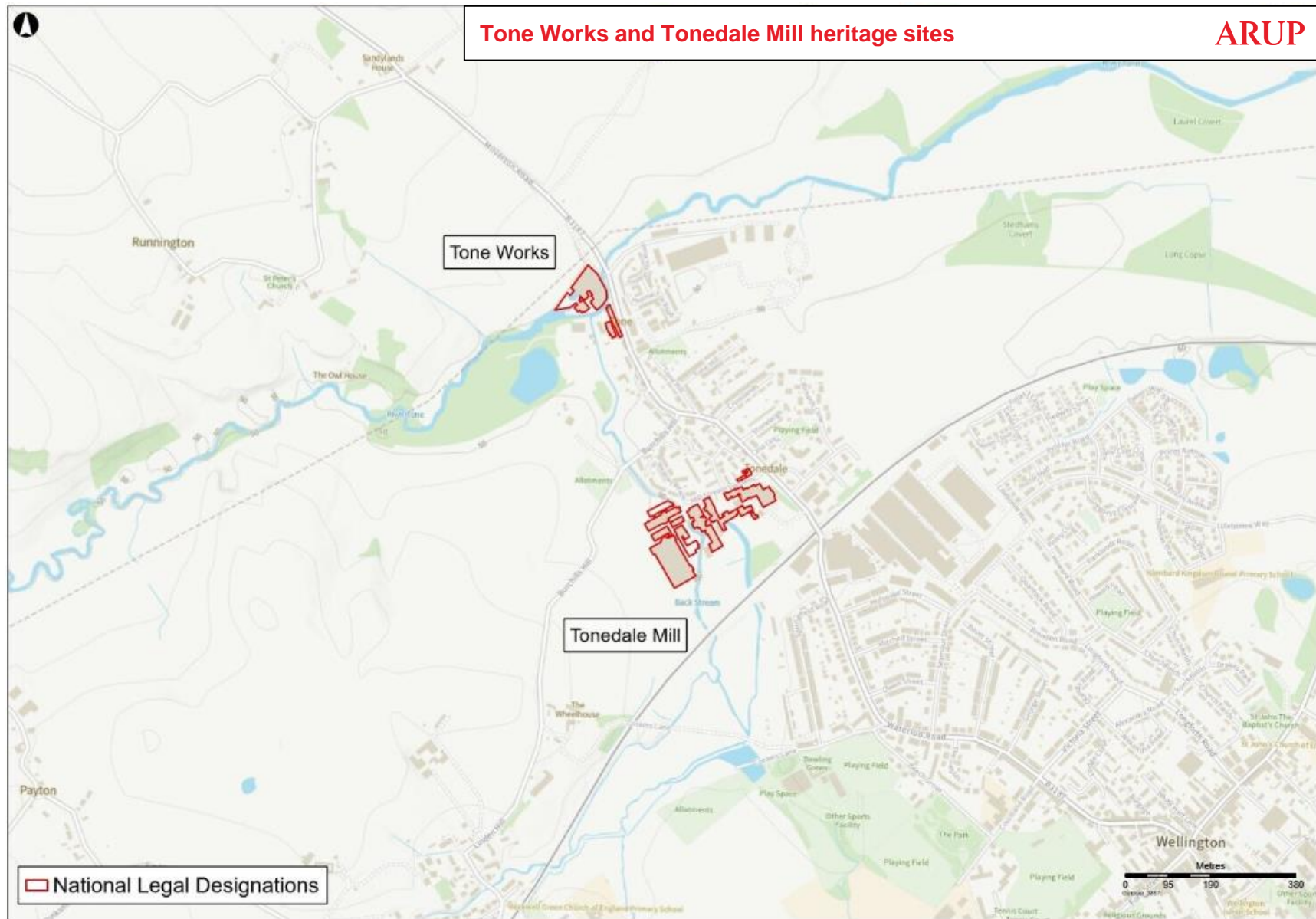


Figure 6. Map of the Tone Works and Tonedale Mill heritage sites in relation to the local area.



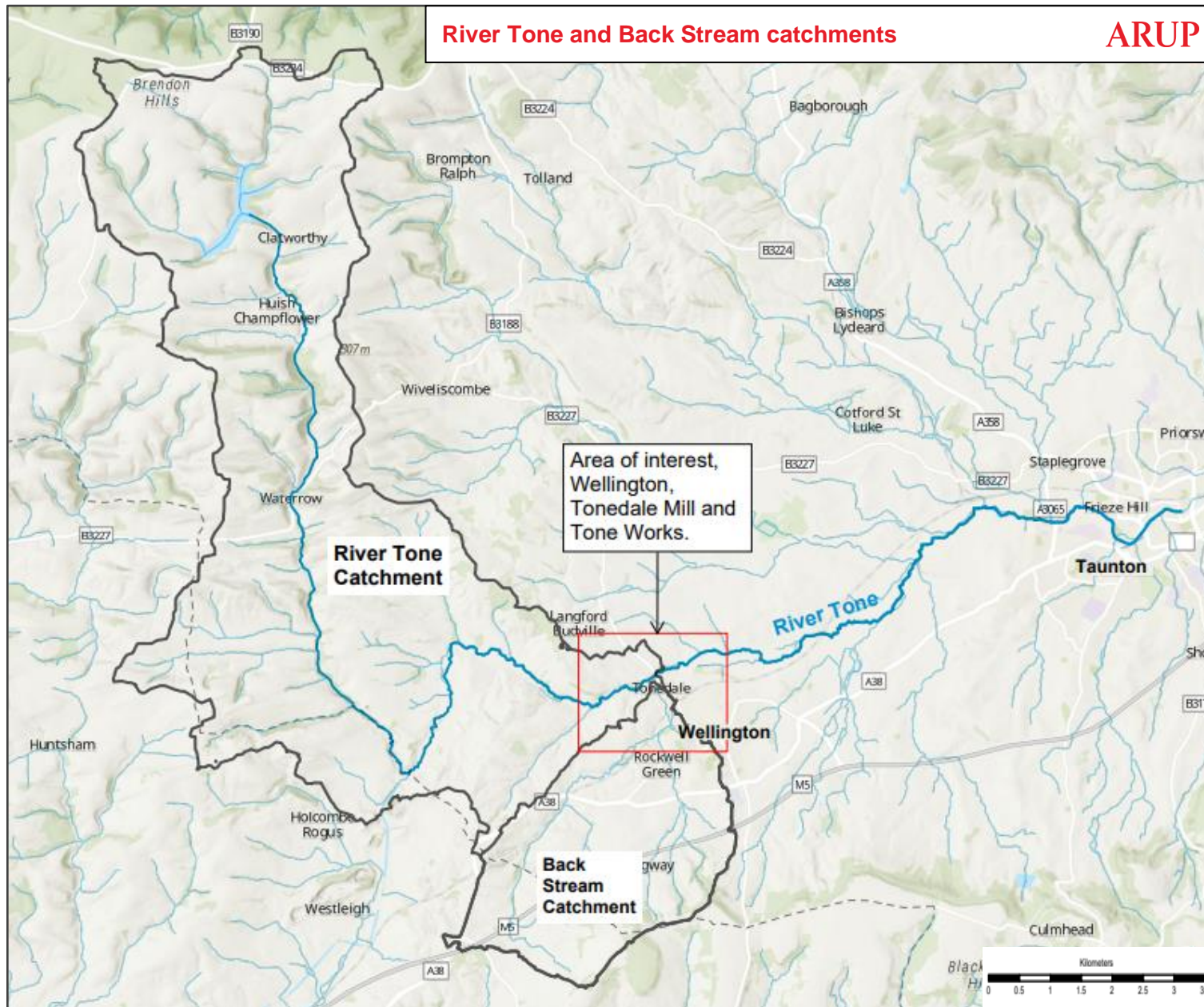


Figure 7: Map of the River Tone and Back Stream catchments in relation to the approximate area of interest.

## 2. Context of the Study Area

This Study focuses on two catchment areas, these being the River Tone and Back Stream, both which make up the wider catchment. The River Tone flows from Wellington into Taunton, and is considered the primary source of flooding in Taunton. The watercourse has heavily modified as a result of its historic industrial use in the area of Tonedale and Wellington. The watercourse powered Tone Works and Tonedale Mill via waterwheels, and water was diverted to treat fabrics.

The following sections provide a summary of the current context and condition of the waterways today, including current flood risk, the water environment, ecology and biodiversity, climate change, the historic environment, and the landscape. For more information, please refer to the Baseline Report included as part of this consultation.

### 2.1 Flood Risk

The study area is at high risk of fluvial (river) flooding, as well as surface water flooding from extreme rainfall. To reduce fluvial flooding to the community of Westford (upstream of the site), a flood storage area and weir were constructed in the 1990s. The Tone Works and Tonedale Mill sites are both at risk from fluvial (river) flooding. The consequences of flooding are structural deterioration and loss of historic fabric. The current flood risk to the sites also severely prevents their suitability for re-development and the potential for future use by the community.

### 2.2 The Water Environment

The River Tone is connected to the Somerset Levels and Moors Ramsar site, which has excessive phosphate nutrients. This Study should consider opportunities to achieve 'nutrient neutrality' by reducing or mitigating the concentration of nutrients. It is unlikely that any options pursued for this study would lead to an increase in nutrient emissions to the River Tone, with the exception of tourism, whereby visitors may increase the volume of wastewater generated and discharged through facilities.

### 2.3 Ecology and Biodiversity

An ecological assessment found the Study area to be biodiversity-rich, with well-connected, diverse habitats and potential for wildlife such as bats, otter and notable invertebrates, such as the ghost moth.

General limitations to the biodiversity value of the area included potential pollution from agricultural run-off and urban land-uses, watercourse habitats obstructed by artificial structures and shading, disturbance and erosion from members of the public, and presence of invasive non-native plants.

Despite this, the biodiversity value of the site is relatively high. This presents both a challenge, in ensuring legal compliance of any proposed works and minimising any potential negative impacts, as well as an opportunity to benefit an array of flora and fauna through strategic and holistic enhancement works. The key theme for ecology would be to minimise impacts and maximise benefits through considered, multi-disciplinary design.

## 2.4 Climate Change

Somerset Local Authority has a Climate Emergency Strategy, which was agreed by all five former local authorities. The aim of this strategy is to reduce carbon emissions in the county and make Somerset a county resilient to the inevitable effects of climate change.

The local climate in Wellington (including Tonedale) is projected to change significantly in both winter and summer, with warmer summers, drier summers and wetter winters. Under high emissions scenarios, by 2080, the average temperature is expected to be 3.3°C warmer in summer, rainfall increasing by 13% in winter and rainfall decreasing by 27% in summer. The number of dry days set to increase from 113.2 to 134.3 per year by 2080.

There are key historic environment sites and waterways within the Tonedale area which present opportunities to generate renewable energy, which will support Somerset Council's net zero target. However, these need to be carefully assessed as renewable energy opportunities pose challenges for the conservation and management of heritage sites. Such challenges include:

- Visual impacts;
- Planning and permitting controls;
- Cost implications;
- Technology fitting without impacting on the historic asset (structural limitations); and
- The suitability and local energy needs.

## 2.5 Historic Environment

The Tonedale Mill and Tone Works sites are the primary focus of this study. These buildings are significant due to their history as the headquarters of Fox Brothers & Co Ltd, established around 1800. They produced woollen and worsted fabrics. It is considered the company and its employment have been central to the development of Wellington as a town.

The historical environmental assets relevant to the Study and located within the study area include:

- 12 Listed buildings (4 of which are Grade II\*) and a registered Grade II\* Park and Garden.
- 26 records for archaeological remains and other non-designated heritage assets.

Previous archaeological investigations nearby found three buried heritage assets that may be of Prehistoric, specifically Bronze Age or Iron Age, or Roman date. There are 24 non-designated assets, predominately from the 18th and 19th century. Two non-designated heritage assets of the Modern period are recorded: Tone Bridge, which was built in 1914, and the rebuilt Wellington railway station dating from 1943 (Figure 8).



Figure 8. Remains of a historic arched bridge, upstream of the railway bridge.



Figure 9. Tithe Map 1940 (Somerset Council).

In 1840, Tonedale Mill and some of its associated structures were already present (Figure 9). Between 1840-1888, a railway line was constructed. Westford Stream has been modified so that it runs parallel to the railway and its small meanders are removed. Downstream of the railway, before the mill, the course of the stream has also been straightened (Figure 10).

Tonedale Mill and Tone Works both sit on the western edge of Wellington, not far from the Wellington Conservation Area. Wellington is located at the foot of the Blackdown Hills Area of

Outstanding Natural Beauty. The Wellington landscape comprises a mix of lowland mixed farming landscape, with dense hedges, sparse woodland, red soils and settlement pattern.

Close to Wellington Park is the Wellington Basins, which is a registered local nature reserve. As well as its wildlife interest also provides recreational value with boardwalks and seating areas. A long-distance footpath called the Two Counties Way which joins the Grand Western Canal National Trail at Greenham, runs close to The Tone Works and follows the route of the remnant section of the Grand Western Canal, north of the town.



Figure 10. OS Map of Wellington showing Tonedale Mills in 1888 (National Library of Scotland).

## 3. Objectives

### 3.1 Overarching Objective

The overarching objective of the Study is to:

*“gain a clear understanding of the options and feasibility for reducing flood risk to Tonedale, Wellington and the wider catchment; whilst at the same time presenting innovative enhancements to the historic, landscape and ecological context.”*

#### Somerset Moors and Levels Flood Action Plan.

It has been agreed that the option identified should align with the following targets set out within the Somerset Moors and Levels Flood Action Plan:

1. Reduce the frequency, depth and duration of flooding.
2. Maintain access for communities and business.
3. Increase resilience to flooding for families, agriculture, businesses, communities, and wildlife.
4. Make the most of the special characteristics of Somerset (with internationally important biodiversity, environment and cultural heritage).
5. Ensure strategic road and rail connectivity, both within Somerset and through the county to the South West peninsula.
6. Promote business confidence and growth.



Figure 11. Tonedale Mill heritage.

## 4. Options Appraisal Approach

### 4.1 Identification of Options

To identify potential options, our approach focused on three geographical scales, these being:

- Site specific: the immediate area of Tone Works and Tonedale Mill;
- The local area: within the local area adjacent to the sites (e.g. wider historic waterways, Fox's Fields); and
- Sub-catchments: the whole River Tone sub-catchment.

See Figures 6 and 7 in Section 1.5 for maps of the study area.

As part of the options appraisal approach, it was agreed with Somerset Council, that a long list of options to reduce food risk in the area should be established. This long list of options included a selection of defence, resilience, and water storage options across all three geographical scales (see examples in Figure 12).

(a)



(b)



(c)



Figure 12. Examples of types of flood risk management options, (a) catchment scale management, (b) a leaky dam, as a form of natural flood management, (c) a flood wall, as a form of flood defence.

## 4.2 Shortlisted Options

Each option within the long list was assessed against a range of criteria, including benefits or impacts on other environmental or placemaking disciplines (e.g. historic environment, ecology, landscape and amenity, and carbon). The sum of these scores then allowed the overall benefits or impacts of the potential option to be understood, resulting the identification of shortlist options, as shown in Figure 13.

This shortlist of options was then categorised into two potential approaches, which were presented upon to the Steering Group for technical input and decision-making.

These two preferred approaches were:

- Flood resilience and adaptation; and
- Flood defences.

Resilience measures do not prevent flooding but allow a quicker recovery following flooding by utilising materials which allow for easy clean up, keeping electrical cables above water level, and selecting use of a space that is non-critical or can be moved amongst other measures. Allowing a site to flood can increase the danger to people. Careful planning is required to ensure that users of the site are adequately informed about what to do during a flood event, including how to safely evacuate.

Flood defences are typically designed to protect an area from a flood event by means of hard infrastructure like a flood wall (Figure 10c). These defences are designed to a ‘Standard of Protection’ which reflects the typical severity of a flood that the infrastructure would protect a property from. For example, a flood defence designed to a Standard of Protection of a 1-in-100-year flood event, means that the property or site should be protected under a storm predicted to fall

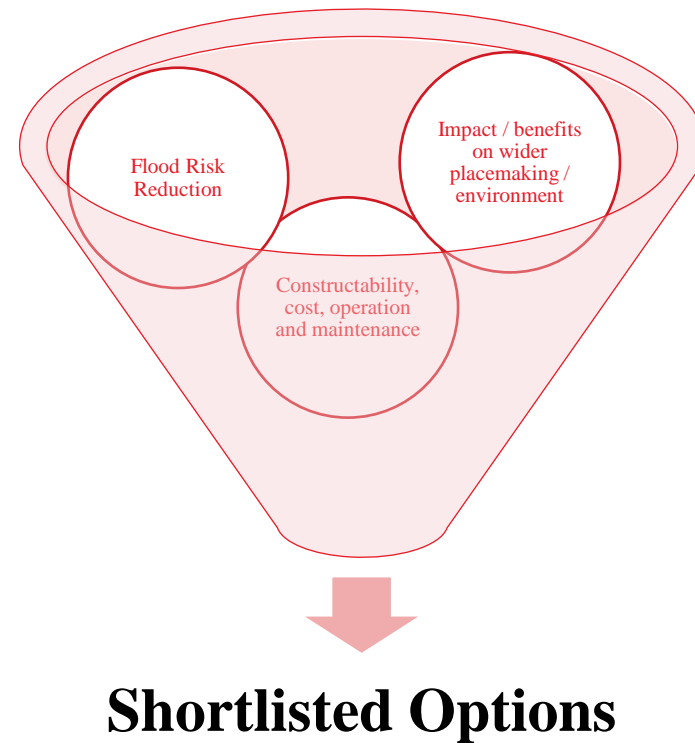


Figure 13. Options Appraisal approach process using multi-criteria analysis.

only once within a 100-year record. However, this severity of event is becoming more frequent due to climate change, and at the site of Tone Works, such a flood event could require flood walls up to 2m high, which may be unviable for technical, financial, heritage and aesthetic reasons.

At the Tone Works site, various in river features have been identified as constricting flow at this section of river contributing to flood risk upstream. There may be potential to alter these obstructions to reduce flood risk and improve fish passage at the site. However, increasing flow could have detrimental impact on downstream communities, and cannot be further commented on without a hydraulic model.

These shortlisted options were identified as technically viable (although complex) and could be complemented by options to help store water in the upper catchments of the Tone and Back Stream. This may include natural flood management, smaller flood storage areas, and better management of drainage from the M5. These storage options may help reduce flood risk to Wellington and downstream communities, but cannot mitigate against flooding at the two sites alone.

Running concurrent to this options appraisal approach, a raft of opportunities were identified across the wider area which will be further refined through consultation and feasibility work.



**Figure 14. Ecological and historical characteristics of Wellington waterways.**

### **4.3 Stakeholder Engagement**

Stakeholder feedback provided is integral to the development of this Study. The Community Forums, Steering Groups and Public Consultation are an essential component to ensuring successful outcomes and highlighting opportunities for reducing flood risk and providing innovative enhancements to the historic, landscape and ecological context.

Steering Group and Community Forum meetings have been held at key milestone of the study. This has established environments for discussion and where members can provide their feedback and discuss their thoughts and collaborate with project team members. Types of discussions included;

- The consideration of waterways for wildlife corridors.
- The importance of connectivity within the area, for both the community but also ecologically as some habitats are isolated.
- The improvement of Public Rights of Way and crossings.
- The exploration of historic mapping in the area
- The huge potential for opportunities and the need for the study to be adventurous; and
- The project should remain realistic on what can be achieved.

This feedback has been considered within the options appraisal, the shortlisted options and has contributed to creating the preferred approach. This stakeholder engagement will continue throughout the remainder of the study and will aid in establishing a vision or for reducing flood risk to key heritage assets and deliver wider benefits for nature and the community.



## 5. Preferred Approach

### 5.1 Overview

The project team agreed on a preferred approach to be taken forward for a feasibility assessment in January 2024. This was established by evaluating the findings from collaboration with Stakeholders (Steering Groups and Community Forum) and discussion with Somerset Council. Both Stakeholders and the Council were in alignment of a preference to work with nature in the most sustainable manner possible. The preferred approach therefore is **resilience and adaptation** at both Tone Works and Tonedale Mill, alongside the investigation of river constrictions at Tone Works specifically. This approach is complemented by water storage across the wider catchment upstream on both the River Tone and Back Stream, focussing on natural flood management.

### 5.2 Tone Works

Under a resilience approach, structural reinforcements would be required at the Tone Works to ensure that structures and operational infrastructure can flood in a safe manner without deteriorating or risking structural failure.

The design of spaces in which people may live or work requires careful planning so that safe evacuation can occur. It is acknowledged the existing access to the Tone Works from the north may need some modification to ensure it remains a safe access and exit from the site during times of flooding.

This approach also considers further investigation of removing river obstructions at the Tone Works, such as the removal and re-routing of services and pipe crossings which in their current location may catch debris, or other historic watercourse constraints which reduce flow rate through the site. Potential removal of obstructions could

allow for increased flow through this river section and reduce flood risk to Tone Works. However, if obstructions were to be removed, detailed flood risk modelling would be required before progressing to determine any potential risk to downstream communities from such an approach.



Figure 15. Back Stream at Tonedale.

### 5.3 Tonedale Mill

Given the multi-storey nature of many of the buildings at Tonedale Mill, it may be possible to focus resilience measures on the ground floor of the buildings, whilst retaining more sensitive uses (e.g. commercial or residential) at higher floors.

Resilience measures could be incorporated into the structural rehabilitation and refurbishment of the buildings, thereby reducing overall costs. The ongoing cost of maintenance and clear up following flooding will need to be considered as part of the solution costs.

Resilience measures do not prevent flooding, therefore a risk to users of the site from flooding would remain. This risk could be managed by careful planning to ensure that site users know how to respond during and after a flood event.



Figure 16. Tonedale Mill main building.

### 5.4 Wider catchment

To complement options at the sites there is opportunity to better manage the storage of water in the wider catchment. The wider catchment includes both the Back Stream Catchment and the River Tone Catchment (see

Figures 6 and 7).

The smaller Back Stream catchment offers greater potential reductions in flood risk, however, in both catchments there is good opportunity for intervention. Water storage in the catchment could help to reduce the frequency, duration and depth of flooding at both these heritage sites.

Storage strategies of interest are Natural Flood Management throughout the wider catchment, flood storage areas on the River Tone catchment, and improved management of surface water drainage from the M5 into the Back Stream catchment.

#### Natural Flood Management

Natural Flood Management (NFM) opportunities have been identified across the catchments of the River Tone and Back Stream. These range from opportunities to plant trees to improve infiltration and soil moisture storage via soil management, to elements of upland river and stream network restoration to slow the flow.

NFM provides multiple benefits by reducing transport of pollutants to the watercourse, reducing soil erosion, and creating habitat. The flood risk benefits of NFM will be further explored in the Feasibility Study.

## 5.5 Wider Environmental Opportunities

Through the process of identifying the challenges of working in the area to reduce flood risk to the heritage sites, a selection of opportunities were also identified related to the historic environment, ecology, the water environment, landscape and place, and renewable energy generation.

These opportunities were identified, some without reliance on a particular specific flood risk management approach, will be refined further through engagement with stakeholders, forum members and public feedback. These opportunities are a combination of specific to the heritage sites, parts of the wider area between Tonedale Mill and the basins, and the upper catchments of both the River Tone and Back Stream.

Potential examples of these opportunities for further refinement are as below;

- Historic environment opportunities such as repair works to historic buildings,
- The opportunity to expand the archaeological record of the local Tonedale area; and
- Potential for ecological enhancements such as otter holts and kingfisher perches, as well as habitat changes to maximise the suitability for wildlife.

## 5.6 Wider community opportunities

Additional opportunities from ecological, nutrient management, accessibility, amenity and renewables have also been identified across the locale – around the two sites and Fox’s fields. The selection of these opportunities will be refined further with stakeholders, forum members and public feedback.

Examples of potential wider opportunities to benefit the community include:

- Partnership with local community groups to ensure the design of new features can be incorporated into the existing amenity contribution that Fox’s Field provides to the local community.
- Public Realm improvements through the creation of a heritage trail along with associated recreation and education opportunities. This could include a wayfinding initiative which presents the story of the waterways and how they have influenced the historic and present-day context of Wellington and surrounding area.
- Helping the creation of a walking and cycling-friendly Wellington by enhancing the existing Public Rights of Way network. This could include the establishment of a circular walking and cycling route; and Works could include improving access under the railway south of Tonedale Mill and creating new inclusive access over the weir north of Wellington Basins.

These opportunities to benefit the environment and community will be further refined, and a selection brought forwards as part of the wider vision produced from this Study.

## 6. Next steps

We would like to hear your feedback on the preferred approach of resilience and adaptation at Tone Works (including further investigation or removing constrictions) and Tonedale Mill. In addition to complementary natural flood management and water storage opportunities across the wider catchment to reduce flood risk.

The preferred approach will be taken forward for a feasibility assessment as part of the Study, for further technical refinement and to incorporate stakeholder knowledge and feedback.

### Thank you!

Thank you for taking the time out to find out more about the Wellington Waterways Feasibility Study, and for providing us with your feedback.

Once the public consultation has closed, your feedback will be analysed, reviewed and considered by the project team. This will help them to present a refined vision for the Study area, supported by a technical report which demonstrates the feasibility work undertaken.

