

Skipton Mapping Technical Note

Final

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Contract

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This report describes work commissioned by North Yorkshire Council by an email dated 12 September 2023. The Client's representative for the contract was Ruth Parker of North Yorkshire Council. Olivia Fearn and Sarah Hambling of JBA Consulting carried out this work.

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1 Introduction

1.1 Context

JBA previously produced a Level 1 Strategic Flood Risk Assessment (SFRA) for Craven in 2017 to support the development of the Craven Local Plan.

JBA have been commissioned to provide a partial update to the current SFRA maps for Craven. The scope of this work was to update Detailed Map 68, which covers the southwest quadrant of Skipton. Figure 1-1 shows the study area for this mapping update. Since the publication of the SFRA, flood defences have been constructed on Eller Beck and Waller Hill Beck (Skipton Flood Alleviation Scheme) and Ings Beck. This update is required to incorporate the newly available fluvial modelling into the mapping, producing updated fluvial flood zones that take account of the current situation within Skipton. No other sources of flooding have been updated or considered within this assessment.

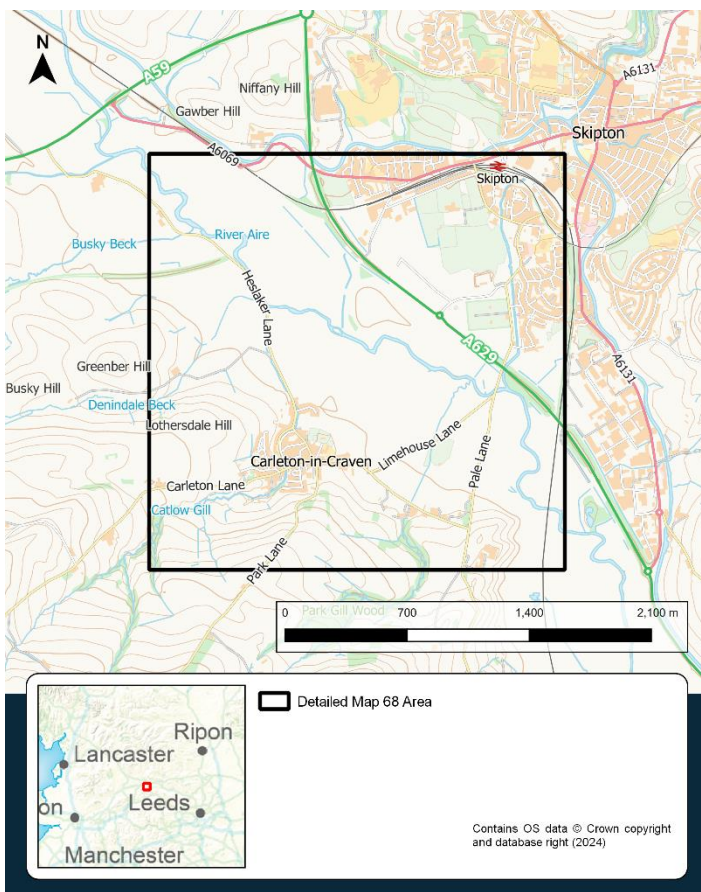


Figure 1-1: Coverage of the Detailed Map 68 area.

This technical note provides details of the approach taken to delineate functional floodplain with the available updated model data. This note should be used in conjunction with the updated Detailed Map 68.

1.2 Deliverables

The following deliverables have been produced from this work:

- An updated GeoPDF of Detailed Map 68
- This accompanying technical note
- Shapefiles of the updated flood zones, for each individual model and the combined outputs

2 Mapping updates

2.1 Fluvial models

Three fluvial hydraulic models were provided for this mapping update: the Skipton Post FAS model, the River Aire model from Bell Busk to Kildwick, and the Ings Beck model.

Details of the models and the available outputs are included in Table 2-1 below.

Table 2-1: Model outputs made available for this mapping update.

Model	Year	Defences?	3.3% AEP	2% AEP	1% AEP	0.1% AEP	1%AEP CC	0.1% AEP CC
Skipton Post FAS	2022	Defended	No	Yes	Yes	Yes	Yes (+20% and +30%)	No
Skipton Post FAS	2022	Undefended	No	No	Yes	Yes	Yes (+ 30%)	No
Bell Busk to Kildwick	2022	Defended	Yes	Yes	Yes	Yes	Yes (+23% and +31%)	Yes (+23% and +31%)
Bell Busk to Kildwick	2022	Undefended	Yes	Yes	Yes	Yes	Yes (+23% and +31%)	Yes (+23% and +31%)
Ings Beck	2022	Undefended	No	No	No	No	Yes (+30%)	No

The only model results available for the Ings Beck model were for the 1% AEP plus 30% climate change event. Comparing the Ings Beck model extents with those outputs from the Skipton FAS model, the Ings Beck model extents within the Detailed Map 68 area were almost entirely contained within the outputs from the Skipton FAS model, due to the considerably smaller size of the Ings Beck watercourse compared with the other watercourses within the mapping area. Therefore, within this mapping study the Ings Beck model has not been used, and the updated Flood Zone 3b has been defined using the River Aire and Skipton FAS models.

2.1.1 Functional floodplain

Table 1 of the Planning Practice Guidance (PPG) Flood Risk and Coastal Change defines the functional floodplain (Flood Zone 3b) as land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise of:

- land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or
- land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

Since the 2017 Craven SFRA, the definition of functional floodplain has been updated, previously being defined in the PPG as land having a 5% or greater annual probability of flooding.

Table 2-1 provides an overview of the available extents of the modelling and shows gaps in identifying functional floodplain at the defined extent in the PPG. As the purpose of this study is to inform allocation of development and not site-specific assessment, hydraulic modelling was not re-run to produce additional flood extents. This is proportionate to the purpose of the study and associated time and budget implications of re-running modelling. Therefore, functional floodplain for this study has been defined using the following process based on local understanding and in agreement with the Environment Agency:

1. Where the 3.3% AEP defended model extent is available this has been used to define functional floodplain. This is the case for the Bell Busk to Kildwick model.
2. The 2% AEP defended model extent has been used as a conservative proxy where no 3.3% AEP model extent is available. This is the case for the Skipton Post FAS model.
3. Any areas located within the Environment Agency designated Flood Storage Areas (FSAs) are also identified as functional floodplain as areas designated to flood. However, areas designated FSAs that fall outside the 1% AEP undefended model flood extent (Flood Zone 3a) were not incorporated. These areas have been excluded due to the greater confidence in the hydraulic modelling in this area compared with the defined FSAs, following consultation with the Environment Agency.

Historic flood records have not been included within the definition of functional floodplain for this study due to the greater confidence in the hydraulic modelling in this area compared with the Environment Agency Historic Flood Map, following consultation with the Environment Agency.

In line with the PPG, climate change has not been included within the definition of functional floodplain.

2.1.2 Flood Zones - model extents

Flood Zones 2 and 3a show the same extent as the Environment Agency Flood Map for Planning, which incorporates the latest outputs from the River Aire and Skipton FAS models.

Table 2-2 sets out the model extents used to define each of the Flood Zones within this mapping update, in agreement with the Environment Agency.

Table 2-2: Model extents used to delineate the flood zones for this mapping update.

Layer	Model extents included
Flood Zone 2	Environment Agency Flood Map for Planning Flood Zone 2 which incorporates the 0.1% AEP undefended flood extents for both the Skipton Post FAS and Bell Busk to Kildwick models.
Flood Zone 3a	Environment Agency Flood Map for Planning Flood Zone 3 which incorporates the 1% AEP undefended flood extents for both the Skipton Post FAS and Bell Busk to Kildwick models.
Flood Zone 3b	3.3% AEP defended flood extent for the Bell Busk to Kildwick model. 2% AEP defended flood extent for the Skipton Post FAS model. Additional areas from the Environment Agency FSAs dataset (where these fall within the extent of Flood Zone 3a).

2.2 Climate change

The Environment Agency climate change guidance for peak river flows was last updated in July 2021. The latest guidance is available on the [Environment Agency website](#).

The Detailed Map 68 area falls within the Aire and Calder Management Catchment. The current climate change allowances for this Management Catchment are shown in Table 2-3.

Table 2-3: Peak river flow climate change allowances for the Aire and Calder Management Catchment.

Allowance period	Central	Higher central	Upper end
2020s	11%	15%	24%
2050s	13%	18%	31%
2080s	23%	31%	51%

The Environment Agency guidance sets out that both the central and higher central allowances should be assessed within an SFRA.

As discussed above, no models were re-run to produce additional flood extents as part of this mapping update, however, where suitable model outputs with climate change allowances were available, these have been incorporated into the updated mapping.

The Bell Busk to Kildwick model has been run with the latest climate change allowances for both the 1% AEP and 0.1% AEP events so both were incorporated into the mapping. The Skipton Post FAS model has available model outputs for the 1% AEP event for the previous climate change guidance for the Humber River Basin District (+20% and +30%). However, these uplifts are very similar (within +/-5%) of the current guidance so have also been incorporated into the mapping following consultation with the Environment Agency.

Table 2-4 sets out the climate change mapping layers and model extents included for each.

Table 2-4: Model extents used to represent climate change for this mapping update.

Layer	Model outputs included
1% AEP Central CC	1% AEP plus 23% climate change defended flood extent for the Bell Busk to Kildwick model. 1% AEP plus 20% climate change defended flood extent for the Skipton Post FAS model.
1% AEP Higher Central CC	1% AEP plus 31% climate change defended flood extent for the Bell Busk to Kildwick model. 1% AEP plus 30% climate change defended flood extent for the Skipton Post FAS model.
0.1% AEP Central CC	0.1% AEP plus 23% climate change defended flood extent for the Bell Busk to Kildwick model.
0.1% AEP Higher Central CC	0.1% AEP plus 31% climate change defended flood extent for the Bell Busk to Kildwick model.

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