South Tyneside Level 2 SFRA - Appendix A

Draft Functional Floodplain

Delineation Methodology

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Prepared for:

South Tyneside Council



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# Introduction

The Flood Risk and Coastal Change Planning Practice Guidance[[1]](#footnote-1) (FRCC-PPG) states that local planning authorities (LPA) should identify in their Strategic Flood Risk Assessments (SFRA) areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency (EA). The South Tyneside functional floodplain (Flood Zone 3b) extent for the Port of Tyne has therefore been updated as part of this Level 2 SFRA using the most up-to-date data available for the Tyne Estuary. The previous functional floodplain extent, delineated for the 2022 Level 1 SFRA, should still be considered as the most up-to-date functional floodplain information for the rest of the South Tyneside authority area. This methodology note explains the delineation process.

Note that Flood Zone 3b is not included in the Flood Map for Planning. EA guidance states that the Level 1 SFRA should define the functional floodplain. This SFRA therefore sub-divides Flood Zone 3 into Flood Zone 3a and Flood Zone 3b. This distinction is for the use of LPAs and developers in development planning. Flood Zone 3a can be considered to be Flood Zone 3 of the Flood Map for Planning that is not functional floodplain.

The LPA, Lead Local Flood Authority (LLFA) and the EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the LPA, LLFA and the EA is therefore crucial in defining the functional floodplain as robustly and realistically as possible.

# Functional floodplain definition

The EA's SFRA guidance[[2]](#footnote-2) states that the Level 1 SFRA should include the functional floodplain extent on maps with a detailed explanation of how the functional floodplain was defined. This methodology note provides this definition.

The EA's SFRA guidance (2024) and FRCC-PPG (2022) state that functional floodplain should show land that:

* "would flood from rivers or the sea with an annual probability of 1 in 30 (3.3%) or greater in any year, with flood risk management features and structures operating effectively
* would normally form the river channel
* is designed to flood (such as flood attenuation schemes), even if it would only flood in more extreme events (such as 0.1% annual probability)."

Regarding the impact of defences on the functional floodplain:

"In any modelling used to identify the functional floodplain, include existing defences and other flood risk management features and structures.

You may not need to designate the functional floodplain in locations where evidence shows flooding would be prevented by existing:

* flood defences
* flood risk management features or structures
* buildings.

Regarding the impact of existing buildings on the functional floodplain:

"The footprints of existing buildings may be removed from functional floodplain extents. However, it may be simpler to include existing buildings and use local policies to control the redevelopment or changes of use that may be acceptable.

Use local policies or guidance to explain the approach you will take when buildings are demolished in functional floodplain. It may be reasonable to assume that sites revert to functional floodplain when buildings have been demolished for more than a year".

# Functional floodplain delineation

## Datasets

Based on the above guidance, the modelled flood outlines (MFO) listed in Table 3‑1 below were provided by the EA to assist in the delineation of the functional floodplain extent at the Port of Tyne, which supersedes the previous extents covering the study area. Where possible, direct modelling of the present and future 3.3% AEP event has been used to delineate Flood Zone 3b in areas where there are accepted and finalised models.

The hierarchy of methods used to define Flood Zone 3b is outlined below:

1. Use of detailed model outputs where they are available. Only final and approved model outputs have been used to delineate Flood Zone 3b (Table 3‑1).
2. Use of the buffered watercourse (8 metres either side of the channel) and delineated Flood Storage Area layers (Table 3‑2).

Table 3‑1: EA modelled flood outlines

|  |  |  |  |
| --- | --- | --- | --- |
| Model | Year | Annual Exceedance Probability (AEP) | Defended? |
| Tidal Tyne | 2008 | 3.3% | No |

Along with the MFO listed in Table 3‑1, the datasets in Table 3‑2 were also used to assist with the delineation. The EA's Flood Storage Area (FSA) dataset was interrogated and it was found that there were no FSA's within the study area to be included within the functional floodplain outline.

Table 3‑2: Additional datasets

|  |  |
| --- | --- |
| Dataset | Purpose |
| Watercourse Link - OS Open Rivers | To create river channel areas within Flood Zone 3b as requested by EA SFRA guidance.  This dataset includes only watercourses and does not include waterbodies.  The dataset has been buffered by 8m either side of the line to broadly represent the width of the watercourse across the area. It is recognised that this is an approximation. Policy relating to Flood Zone 3b applies to the watercourse and not the mapping where they are different. |

# GIS methodology

The below steps summarise the methodology used to delineate the functional floodplain:

* The Tidal Tyne 3.3% AEP event outline was used as a starting point.
* All river channels were added to the Flood Zone 3b outline, as required by the EA’s guidance. It is noted that the river channel dataset used (OS Open Rivers Dataset, Watercourse Link Shapefile) is a high level dataset that may not be spatially correct in many areas. Recognising this, Flood Zone 3b policy relates to the watercourse including an 8m buffer either side of the channel and not the mapping where they are different.
* The EA's FSA dataset has been reviewed for inclusion in Flood Zone 3b, and it was found that there were no FSAs within the Port of Tyne area.
* Each polygon within the Flood Zone 3b outline has been attributed with the source MFO or dataset, so it is possible to ascertain which model or dataset each polygon within the outline came from.
* Checks on the geometry of the Flood Zone 3b outline were carried out to ensure geometric correctness in GIS.

# Future functional floodplain dataset

In addition to the present day Flood Zone 3b extent, a future Flood Zone 3b extent has also been produced using the present day updated Flood Zone 3b as a starting point, as recommended in the EA's SFRA guidance. This has been updated using climate change enhanced flood modelling across the modelled extent listed in Table 3‑1. Within this modelling, an uplift in sea level estimates has been applied to make allowance for the future impacts of climate change on peak tidal flows in accordance with EA guidance.

|  |  |  |  |
| --- | --- | --- | --- |
| Model | River basin district | Annual Exceedance Probability (AEP) | Sea level rise allowance (m) |
| Tidal Tyne | Northumbria | 3.3% | 1.43 |

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Wallingford

Warrington

Registered Office

1 Broughton Park

Old Lane North

Broughton

SKIPTON

North Yorkshire

BD23 3FD

United Kingdom

+44(0)1756 799919

[info@jbaconsulting.com](mailto:info@jbaconsulting.com)

[](https://www.linkedin.com/company/jba-consulting-ltd-jeremy-benn-/)[www.jbaconsulting.com](http://www.jbaconsulting.com)

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1. [Flood Risk and Coastal Change Planning Practice Guidance | UK Government | 2022](https://www.gov.uk/guidance/flood-risk-and-coastal-change) [↑](#footnote-ref-1)
2. [How to Prepare a Strategic Flood Risk Assessment | Environment Agency | 2024](https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment#level-2-strategic-flood-risk-assessment) [↑](#footnote-ref-2)