

NOTE TO FILE



JBA Project Code 2017s7129
Contract South Tyneside Level 1 SFRA
Lead Client South Tyneside Council
Day, Date and Time 27th September 2018
Author Rachel Bryan
Reviewer Mike Williamson
Subject Functional Floodplain Update

1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous 2009 SFRA using the most up-to-date data available. The following methodology note explains how the 2009 functional floodplain has been updated. The LPA, LLFA and 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 council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional floodplain definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 explains that local planning authorities should identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency

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and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing defences and infrastructure or solid buildings, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2009 functional floodplain

Text taken from the 2009 Level 1 SFRA Update:

This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which could flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at any other probability to be agreed between the LPA and the Environment Agency, including water conveyance routes). For the purpose of South Tyneside Council SFRA, in Zone 3b, developers and local authorities should seek opportunities:

- Reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage techniques; and
- Relocate existing development to land with a lower probability of flooding

4 Functional floodplain update

Based on the above guidance and definitions provided in the FRCC-PPG, the following modelled flood outline (MFO) were provided by the EA to help update the existing 2009 functional floodplain:

The following datasets have been interrogated to update the 2009 functional floodplain for South Tyneside:

- EA's Flood Map for Planning Flood Zone 3
- Functional Floodplain from previous SFRA (2009)
- EA MFOs from latest available modelling studies. Defended scenario outlines were not available, undefended scenario outlines were used.
- EA Flood Storage Areas (FSA) – none present in South Tyneside
- EA Areas Benefitting from Defences (ABD) – none present in South Tyneside
- EA Historic Flood Map (HFM)
- EA Recorded Flood Outlines (RFO)
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

4.1 GIS methodology

- The existing 2009 functional floodplain provided a starting point for review.
- The OS Open Data OSOpenMapLocal_Raster Dataset was used to identify urban areas and transport infrastructure to be removed from the functional floodplain.
- The following MFOs were used to update the 2009 functional floodplain:
 - The River Tyne 2015 20-year Undefended MFO along the northern boundary of South

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- The HFM / RFO datasets were used to update the 3b outline for historically fluvially flooded areas. Not for tidally flooded areas on the northern boundary of South Tyneside.
- Checks on the geometry of the 3b outline were carried out to ensure geometric correctness of the outline
- The 2009 3b outline was compared to the current Flood Zone 3 of the Flood Map for Planning (version February 2018). There are a number of discrepancies meaning it is likely that the Don has been remodelled since 2009. The current Flood Zone 3 was therefore used to update the 2009 functional floodplain along the River Don. **Clarification required from the EA as to why this is the case (see Section 5).** The previous FZ3b was used for the area west of Cleadon Lane to south of Station Approach / B1299, where outlines for Flood Zone 3 were unavailable.
- Internal JBA review of draft outline
- EA review of draft outline and clarifications (See Section 5)
- In September 2018 it was agreed between the EA and STC that employment site E14 (Tyne Dock Infill) had previously been developed as a concrete platform at a level of 4.63 mAOD. STC confirmed this level is above the level of the 1 in 20 AEP event from the 2015 Tyne Model. This functional floodplain has therefore been removed from the site area.

Table 2 Functional floodplain data sources

Watercourse	Extent	Data Source
River Tyne	Northern boundary of South Tyneside including Tyne Dock and the mouth of the River Don to south of Church Bank.	River Tyne 2015 Model
River Don	Reay Crescent, Boldon.	River Don at Reay Crescent 2013 model (added after EA clarification)
River Don	South west extent of the South Tyneside boundary along the River Don to south west of Church Bank to join the River Tyne 2015 model	Flood Zone 3
River Don	West of Cleadon Lane to south of Station Approach / B1299	Previous FZ3b

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

The functional floodplain outline should be assessed by the LPA, LLFA and the EA and any comments or questions should be referred back to JBA in order to agree on a final outline. Consistency across all authorities should be achieved.

5 EA Review of Draft

Black text = JBA queries to EA

Red text = EA clarifications

- Check the areas of HFM that have been included and decide if it is appropriate to include these areas in the final FZ3b outline. **Historic flood outlines have been accepted for use in the Flood Zones.**

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- No 20 or 25 year MFOs received for the Don so the EA Flood Zone 3 is in place here as a proxy. Datasets provided to assist review. **River Don at Reay Crescent 2013 has only been modelled for 100-year and 1000-year events.** This modelling has been added, as agreed by the EA, and is now sourced as 'River Don at Reay Crescent 2013', rather than Flood Zone 3 as a proxy (although the same outline).
- **We can confirm that the FZ3b outline is acceptable and the only change is the outlines for Reay Crescent** (see above)

The following ArcGIS datasets are included within the zip file.

Datasets:

- Functional_floodplain_2018_v1.0.shp
- Supporting data:
 - HFM_201802_STC.shp
 - FZ3_v201802_STC.shp
 - FZ2_v201802_STC.shp
 - S2Q20 Clipped to FZ3 No Tidal 3b_region.shp (Previous 2009 FZ3b)
 - Tyne_20yr_undef_2015.shp (from River Tyne 2015 20 year Undefined model)
 - Don_UNDEF_Q100_Outline_region.shp (River Don at Reay Crescent 2013 model)