

JBA Project Code 2016s4348
 Contract Newcastle Level 1 SFRA
 Client Newcastle City Council
 Day, Date and Time 06 December 2016
 Author Mike Williamson
 Subject Functional Floodplain



1 Functional Floodplain Definition

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

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#), available on the Environment Agency's web site, as indicated in the table below.

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.

1.2 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 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.

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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.

2 2010 Functional Floodplain

Watercourse	Extent	Data Source
Ouse Burn and tributaries	Callerton to Stratford Grove West	1 in 20 year undefended outline from the Ouseburn Flood Study (2006)
River Tyne	Ryton Island to Low Walker	1 in 25 year outline is constrained to the river channel and therefore not shown as functional floodplain

Text taken from the 2010 Level 1 SFRA:

Functional Floodplain Predictions for Newcastle

Outlines for the functional floodplain (Zone 3b) have been derived from available modelling data for Newcastle. For the Ouseburn and its tributaries the outlines are based on the Ouseburn Flood Study model results (JBA 2006). This study included assessment of a range of flood scenarios ranging from the 2 year to 1000 year flood events and the 1% outline generated during this study is the current EA Flood Zone 3b for this SFRA has incorporated the 4% modelled outline as a representation of the Flood Zone 3b areas for the Ouseburn system.

Climate change impacts for the River Tyne have been assessed using model results for the 5% (20 year) design scenario. Only a few highly localised areas along the river bank are classified as functional floodplain.

Comparison of Flood Zones 2 and 3 for the River Tyne through Newcastle indicates that there is little variation between the extents of flooding. Bank levels are, in general, high enough to contain flood water from the River Tyne during the 0.1% event, far in excess of the functional floodplain scenario.

3 Functional Floodplain Delineation

Based on the above guidance and definitions provided in the FRCC-PPG, the following models and modelled flood outlines (MFO) were provided by the EA:

- River Tyne (2015) – 20 year undefended MFO
- Ouse Burn (2011) – no 20/25 year MFOs

Further datasets used:

- Functional Floodplain from previous SFRA (2010)
- Flood Storage Areas (FSA) – none present
- Areas Benefitting from Defences (ABD) – none present
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas from functional floodplain)

3.1 GIS Methodology

- The 2010 functional floodplain provided the starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version November 2016)
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas and

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- transport infrastructure to be removed from the functional floodplain.
- As there are no 20/25 year outlines available from the 2011 Ouse Burn study, the Functional Floodplain for the Ouse Burn and its tributaries is based on Flood Zone 3 of the Flood Map for Planning.

Watercourse	Extent	Data Source
Ouse Burn and tributaries	Callerton to Stratford Grove West	Flood Zone 3
River Tyne	Ryton Island to Low Walker	1 in 25 year outline is constrained to the river channel and therefore not shown as functional floodplain
Hartley Burn	North of Brunswick Village	Flood Zone 3
Prestwick Carr Drains	Prestwick Carr	Flood Zone 3

As it is critical that the outline for the functional floodplain is as accurate as possible, the true extent of the functional floodplain outline should be assessed in greater detail during a more detailed study such as a Level 2 SFRA or site-specific FRA.