

JBA Project Code 2021s1178
Contract Cotswold SFRA Update
Client Cotswold District Council
Date 13 January 2022
Author Laura Thompson
Reviewer Mike Williamson
Subject Functional floodplain update

1 Introduction

The functional floodplain (Flood Zone 3b) extent has been updated as part of this 2021 SFRA update using the most up-to-date data available from the Environment Agency (EA). This methodology note briefly explains the update and original delineation process. The existing functional floodplain outline was delineated through the previous Level 1 SFRA in 2013, therefore the outline produced here is an update based on more recent available data and guidance.

The Local Planning Authority (LPA), Lead Local Flood Authority (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 councils and the EA is therefore crucial in defining the functional floodplain as robustly and realistically as possible.

2 Functional floodplain definition

2.1 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in the table below 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.

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.

2.2 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 is not functional floodplain.

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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)

Source: <https://www.gov.uk/guidance/flood-risk-and-coastal-change#Table-1-Flood-Zones>

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.

2.3 EA SFRA guidance, 2020

The EA guidance defines functional floodplain as land where water has to flow, or which stores water, in times of flooding. The functional floodplain extent should cover land that would flood with an annual probability of 1 in 20 (5%) or greater in any year, with flood risk management features and structures operating effectively and land that would normally form the river channel.

Local circumstances should be taken into account when defining the functional floodplain. The parameters set out in the Planning Practice Guidance should be used as a starting point to identify the functional floodplain.

Defences and other flood risk management features and structures should be accounted for. If evidence shows that existing defences, features and structures, or solid buildings would prevent flooding the functional floodplain will not need delineating in these locations.

The EA should state whether the flood storage areas shown on the Flood Map for Planning are suitable to include in the functional floodplain extent.

If there is not enough detailed information to identify the functional floodplain, this should be made clear on the SFRA maps to ensure risk isn't underestimated. In these areas, site-specific flood risk assessments should determine whether a site is affected by functional floodplain. If sites are proposed for development in such areas in the local plan, a Level 2 SFRA will be required to map the functional floodplain extent.

3 Functional floodplain delineation

Based on the above guidance and definitions provided in the FRCC-PPG, the modelled flood outlines (MFO) listed in Table 3.1 below were provided by the EA to assist in the update of the functional floodplain outline. In addition to those indicated below, the EA also provided the Daglingworth Stream FRA 2016 modelled outputs. However, as outputs were only provided for the 1% and 0.1% AEP events, these were not included within the functional floodplain update.

Model	Year	Annual Exceedance Probability (AEP)	Defended?
Bledlington Brook	2012	5%	Yes
Churn (Baunton to Siddington)	2011	5%	Yes
Thames (MRL to St Johns)	2014	5%	Yes
Windrush (Bourton-on-the-Water)	2014	5%	Yes

Table 3.1: EA modelled flood outlines

The previous Flood Zone 3b outline produced in 2014 has been superseded by more recent modelling where available.

Along with the above MFOs, the datasets in the table below were also interrogated to assist with the delineation.

Dataset	Purpose
OSMasterMapNetworksWater	To create river channel areas within FZ3b as requested by EA SFRA guidance. Culverted and canalised sections have been excluded
Urban areas - OS OpenMapLocalRaster	To remove currently developed areas and transport infrastructure from functional floodplain
EA Flood Storage Areas (FSA)	To confirm Flood Storage Areas are included within the FZ3b outline
EA Areas Benefitting from Defences (ABD)	None present in CDC

Table 3.2: additional datasets

3.1 GIS methodology

- The 2013 FZ3b outline was used as a starting point and the MFOs listed in Table 3.1 were appended where appropriate i.e. MFOs from models since 2013 and named 'FZ3b_CDC_Draft_20220113'.
- All river channels were added to the FZ3b_CDC_Draft_20220113 outline, as required by the EA's guidance.
- The ABD dataset was checked, and it was found that there were no areas benefitting from defences within the CDC boundary.
- The EA FSA dataset was checked and it was found that there were two flood storage areas within the Cotswold District Council area. **The EA must confirm these are appropriate**
- Each polygon within the FZ3b_CDC_Draft_20220113 outline was attributed with the source MFO or dataset, so it is possible to ascertain which model or dataset each polygon within the outline came from.
- OS Open Data OSOpenMapLocal Raster Dataset was used to identify existing buildings, structures and transport infrastructure which were removed from the FZ3b_CDC_Draft_20220113 outline.



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- Checks on the geometry of the FZ3b_CDC_Draft_20220113 outline were carried out to ensure geometric correctness in GIS.

The draft 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. Once the outline is finalised, the development sites assessments can be carried out.

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, as directed by EA guidance.

DRAFT