



City of Manchester Level 1 Strategic Flood Risk Assessment

Appendix D - Functional Floodplain Delineation

Final Report

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Manchester City Council

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MANCHESTER
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Contents

1	Introduction	1
2	Functional floodplain definition	2
3	Available datasets	3
3.1	EA detailed flood modelling	3
3.2	EA Rivers and Sea 3.3% defended flood risk extents	3
3.3	Additional datasets	4
4	Functional floodplain delineation methodology	5
4.1	GIS methodology	5
4.2	Methodology hierarchy	6
4.3	Culverted rivers	6
4.4	Waterbodies	7
4.5	Buildings and infrastructure	7
4.6	Dry islands	7
5	Future functional floodplain	9

List of Tables

Table 3-1: Available EA detailed models and modelled flood outlines	3
Table 4-1: Functional floodplain source attribute definitions	6

Abbreviations

AEP	Annual Exceedance Probability
EA	Environment Agency
FRCC-PPG	Flood Risk and Coastal Change Planning Practice Guidance
FZ3b	Flood Zone 3b
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
MFO	Modelled Flood Outline
SFRA	Strategic Flood Risk Assessment

1 Introduction

The [Flood Risk and Coastal Change Planning Practice Guidance](#) (FRCC-PPG) states that local planning authorities (LPA) should identify and assess, in their Strategic Flood Risk Assessments (SFRA), areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency (EA). The previous functional floodplain extent, delineated for the GMCA 2019 Level 1 SFRA Update, has therefore been updated through this Level 1 SFRA using the most up-to-date data available from the EA. The previous functional floodplain extent has been superseded by more up-to-date modelled outputs, and new national flood mapping, last updated by the EA in January 2026. This methodology note explains the delineation process.

Note that the functional floodplain (Flood Zone 3b) is not included in the Flood Map for Planning. Although the EA now provide the Rivers and Sea 3.3% defended flood risk extents - present day dataset, the functional floodplain should also account for other available data indicating land where water has to flow, or which stores water, in times of flooding. This SFRA therefore sub-divides Flood Zone 3 into Flood Zone 3a and Flood Zone 3b (functional floodplain). This distinction is for the use of the LPA and developers in development planning and management. Flood Zone 3a is Flood Zone 3 of the Flood Map for Planning that is not functional floodplain.

The LPA, Lead Local Flood Authority (LLFA) and the EA have reviewed the extent of the functional floodplain extent 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 EA is therefore crucial in defining the functional floodplain as robustly and realistically as possible.

2 Functional floodplain definition

The EA's [SFRA guidance](#) 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 (2025) states that functional floodplain should show land that:

"Would flood from rivers or the sea with an annual probability of 1 in 30 (3.3%), 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)"

How to Prepare an SFRA, Environment Agency, 2025

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, or buildings"

How to Prepare an SFRA, Environment Agency, 2025

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."

How to Prepare an SFRA, Environment Agency, 2025

If there is not enough detailed modelled information available to identify the functional floodplain, this should be made clear on the Level 1 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 through additional modelling. If sites are proposed for development in such areas in the local plan, a Level 2 SFRA will be required to robustly map the functional floodplain extent.

3 Available datasets

3.1 EA detailed flood modelling

Areas within the available modelled 3.3% Annual Exceedance Probability (AEP) defended extents should be considered as functional floodplain, which is defined as land having a 3.3% or greater annual probability of flooding with consideration of flood defence infrastructure.

Based on the guidance outlined in Section 2, 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 extent. Where possible, direct modelling of the present day 3.3% AEP defended event has been used to delineate the functional floodplain in areas where up to date and finalised detailed models are available. Where the present day 3.3% AEP defended event was not included within a detailed model, the 2% AEP defended event was used where available, as agreed with the EA.

Table 3-1: Available EA detailed models and modelled flood outlines

Model	Year	Annual Exceedance Probability	Defended?
Corn Brook	2017	3.3%	No defences exist
Cringle Black Brook	2017	3.3%	Yes
Upper Mersey	2017	3.3%	Yes
Manchester Ship Canal	2018	2%	No defences exist
Chorlton Platt Gore	2024	3.3%	Yes
Where no defences exist, it indicates that there are no defences present along the watercourse. The defended event would be used in preference to the undefended event where available.			

3.2 EA Rivers and Sea 3.3% defended flood risk extents

The EA has published the 3.3% AEP defended event extent for both present day and accounting for climate change. The defended scenario considers the presence of flood defence infrastructure and assumes such infrastructure operates in the way it was designed to function. This scenario does not include for any asset failure or removal scenarios.

The Rivers and Sea 3.3% defended flood risk extents - present day dataset has been used to represent the functional floodplain in areas where no suitable detailed modelling is available, as agreed with the EA.

3.3 Additional datasets

In addition to the available EA detailed models and EA Rivers and Sea 3.3% defended flood risk extents - present day dataset, the datasets outlined below were also used to assist with the delineation of the functional floodplain:

- EA Statutory Main River Map
 - To define areas of the functional floodplain that are designated as main river by the EA.
 - This dataset includes both open channel and culverted watercourses.
 - The dataset has been buffered by 8 metres either side of the channel line of the main rivers to broadly represent the width of the river across the area. The FRCC-PPG states that a flood risk activity permit, in addition to planning permission, may be required for activity within these specified distances of main rivers. There may also be requirements for Biodiversity Net Gain targets.
 - It is recognised the buffering is an approximation. Policy relating to functional floodplain applies to the actual location of the river and not the buffered channel within the functional floodplain mapping in locations where they may differ.
- EA Flood Map for Planning - Water Storage Areas
 - To define areas of land which store water during a flood event.
 - Water Storage Areas should be consulted on for appropriateness with the EA.
 - The Water Storage Area dataset has been reviewed, and it was found that there is one EA defined Water Storage Area within the City of Manchester, located adjacent to the River Mersey at Didsbury.

4 Functional floodplain delineation methodology

4.1 GIS methodology

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

- All EA detailed models supplied for consideration within this assessment were included within the functional floodplain extent where appropriate outputs were available. The EA Rivers and Sea 3.3% defended flood risk extents - present day dataset was not considered in areas of detailed modelling.
- The EA Rivers and Sea 3.3% defended flood risk extents - present day dataset was used to define the functional floodplain in areas not subject to detailed modelling.
- The EA Flood Map for Planning - Water Storage Areas dataset was used to define areas which are used to store water during a flood event. It was identified that there was one flood storage area in this dataset within the City of Manchester, along the River Mersey at Didsbury.
- All main river channels, including culverted sections, were included in the functional floodplain extent. This is based on text in the EA SFRA guidance to 'define areas that would normally form the river channel and where water has to flow in times of flooding'. At a local scale, this may lead to some inaccuracies, especially in hydrologically complex areas where there are man-made interactions or interactions with other bodies of water such as reservoirs or canals.
- Recognising this, functional floodplain policy relates to the river and not the mapping where they are different. For main rivers, the functional floodplain should include for an 8 metres buffer either side of the channel. The FRCC-PPG states that a flood risk activity permit, in addition to planning permission, may be required for activity within these specified distances of main rivers. There may also be requirements for Biodiversity Net Gain targets.
- Each polygon within the functional floodplain GIS extent has been attributed with the source dataset so it is possible to easily ascertain which dataset each polygon within the extent is based on.
- Checks on the geometry of the functional floodplain extent were carried out to ensure geometric correctness in GIS.

4.2 Methodology hierarchy

The hierarchy of methods used to define the functional floodplain is outlined below:

1. Use of the 3.3% AEP defended event MFO's where available from detailed models
2. Use of the 2% AEP defended event MFO's where available from detailed models
3. Use of the EA Flood Map for Planning - Water Storage Areas dataset (downloaded March 2026)
4. Use of the EA Rivers and Sea 3.3% defended flood risk extents - present day (downloaded March 2026)
5. Use of the buffered EA Statutory Main River Map (8 metres either side of the channel of main rivers)

Table 4-1 provides a description of each source attribute within the functional floodplain dataset.

Table 4-1: Functional floodplain source attribute definitions

Source attribute	Description
2017 Corn Brook 3.3% AEP Event (No Defences Exist)	Detailed model output from the Corn Brook 2017 model.
2017 Cringle Black Brook 3.3% AEP Defended Event	Detailed model output from the Cringle Black Brook 2017 model.
2017 Upper Mersey 3.3% AEP Defended Event	Detailed model output from the Upper Mersey 2017 model.
2018 Manchester Ship Canal 2% AEP Event (No Defences Exist)	Detailed model output from the Manchester Ship Canal 2018 model.
2024 Chorlton Platt Gore 3.3% AEP Defended Event	Detailed model output from the Chorlton Platt Gore 2024 model.
EA Water Storage Areas	Areas of the functional floodplain defined by the EA Water Storage Areas dataset to indicate areas where water is stored during times of flooding.
EA Rivers and Sea 3.3% defended flood risk extents - present day	Areas of the functional floodplain defined by the EA's Rivers and Sea 3.3% defended flood risk extents - present day dataset. This has only been used in areas where suitable detailed modelling is unavailable.
EA Statutory Main River Map (8m buffer)	8 metre buffered polygon of the EA Statutory Main River map indicating areas of fluvial river channel.

4.3 Culverted rivers

The EA Statutory Main River Map includes a high-level and approximate representation of culverted sections of main rivers. These sections are subject to a higher degree of uncertainty as it is more challenging to identify and verify below ground alignments. Within culverted sections, functional floodplain policy relates to the actual confirmed alignment of culverted sections, as identified through site investigation, rather than the alignment shown in the functional floodplain where it differs. The EA or LLFA may be able to advise on the culverted sections of main rivers in the functional floodplain.

It is recommended that investigations of any culverted watercourses on any development sites establish their full route, condition and capacity are carried out through site-specific flood risk assessments at the planning application stage.

Manchester City Council is generally opposed to the culverting of watercourses due the adverse ecological, flood risk, human safety and aesthetic impacts. The Council resists culverting on conservation and other grounds, and consent for such works will not normally be granted except for access crossings.

The Council will consider each application to culvert a watercourse on its own merits and will only approve a culvert if there is no reasonably practicable alternative. It is recognised that there are situations where culverting may be unavoidable in practice, such as short lengths for access purposes or where highways cross watercourses. In these cases, open span bridges or diversion of the watercourse must be considered first as alternatives to culverts.

4.4 Waterbodies

The EA Statutory Main River Map contains open river channels and culverted sections of channel only and does not include for other types of waterbody such as reservoirs, canals, lakes or ponds. Waterbodies are only included in the delineated functional floodplain where they are present within the EA Rivers and Sea 3.3% defended flood risk extents - present day dataset or detailed model outputs.

4.5 Buildings and infrastructure

Buildings and infrastructure within the functional floodplain have been retained within the extent, i.e. they have not been removed on the assumption that floodwater ingress may occur. The EA's SFRA guidance states that you do not need to designate functional floodplain in locations where evidence shows flooding would be prevented by existing buildings, however it is considered simpler to include existing buildings and use local policies to control the redevelopment or changes of use that may be acceptable. Such policies could include no increase in development footprint for buildings within the functional floodplain, converting disused buildings to greenspace or the installation of resilience measures.

4.6 Dry islands

Areas of higher land shown as 'dry islands' within the functional floodplain should also be considered undevelopable, where safe access and escape routes are unachievable. The only exception to this is for water compatible or essential infrastructure uses. It has been assumed that any 'dry islands' within the functional floodplain extents should be considered as functional floodplain where these areas are located within Flood Zone 3 of the EA's Flood Map for Planning.

5 Future functional floodplain

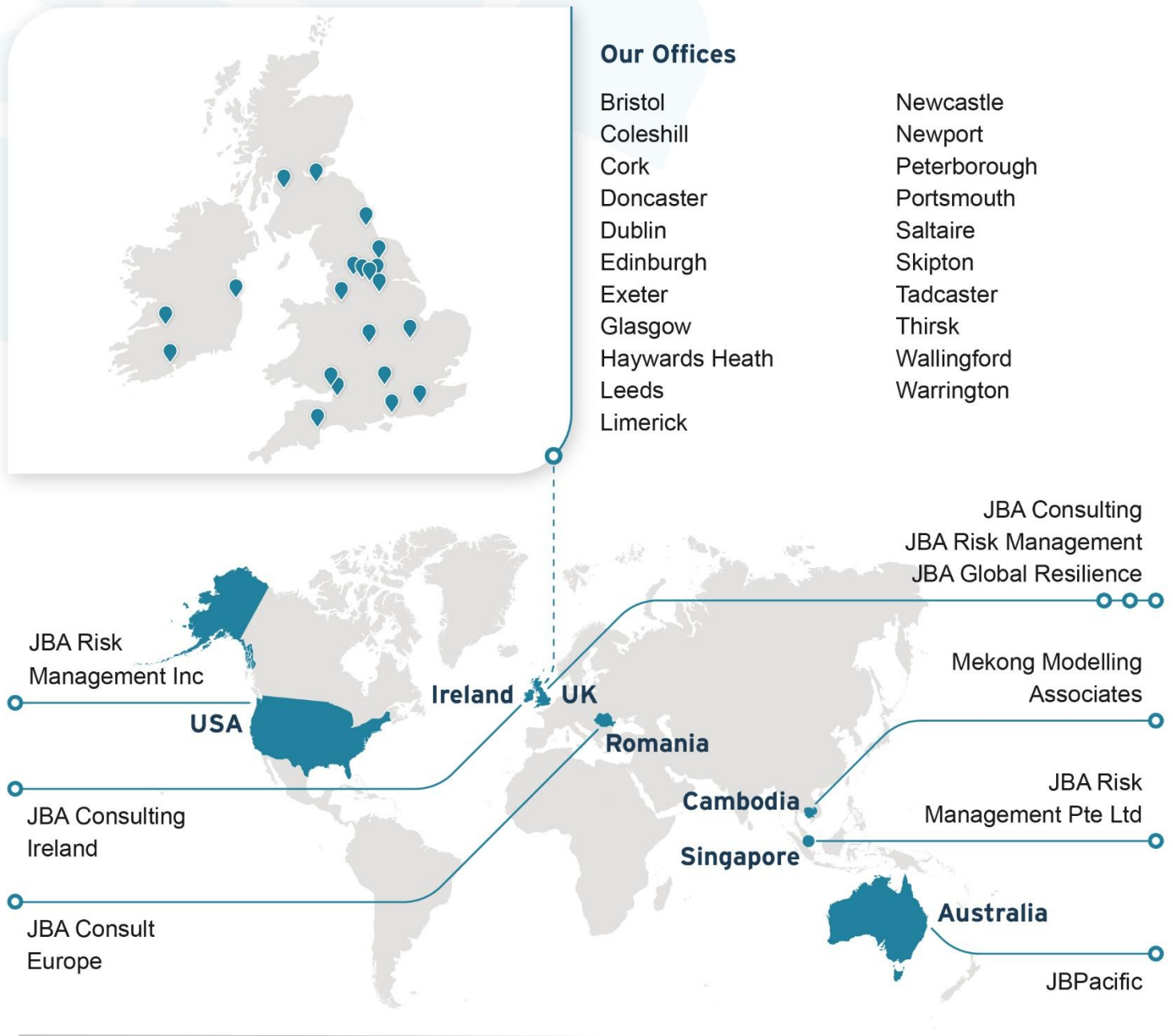
In addition to the present day functional floodplain extent, a future functional floodplain extent, as advised in EA guidance, has been delineated. No suitable 3.3% AEP defended event climate change modelling was available within the supplied EA detailed models, therefore the EA's Rivers and Sea 3.3% defended flood risk extents - climate change dataset has been used to represent the future functional floodplain. The climate change allowances used to produce this dataset are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5.

The future functional floodplain indicates areas that may be within the functional floodplain in the future. The future functional floodplain extent should not be included in the functional floodplain designation and is not included in any policy for planning decisions. The NPPF does not include for the future functional floodplain designation in its policy definitions.

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