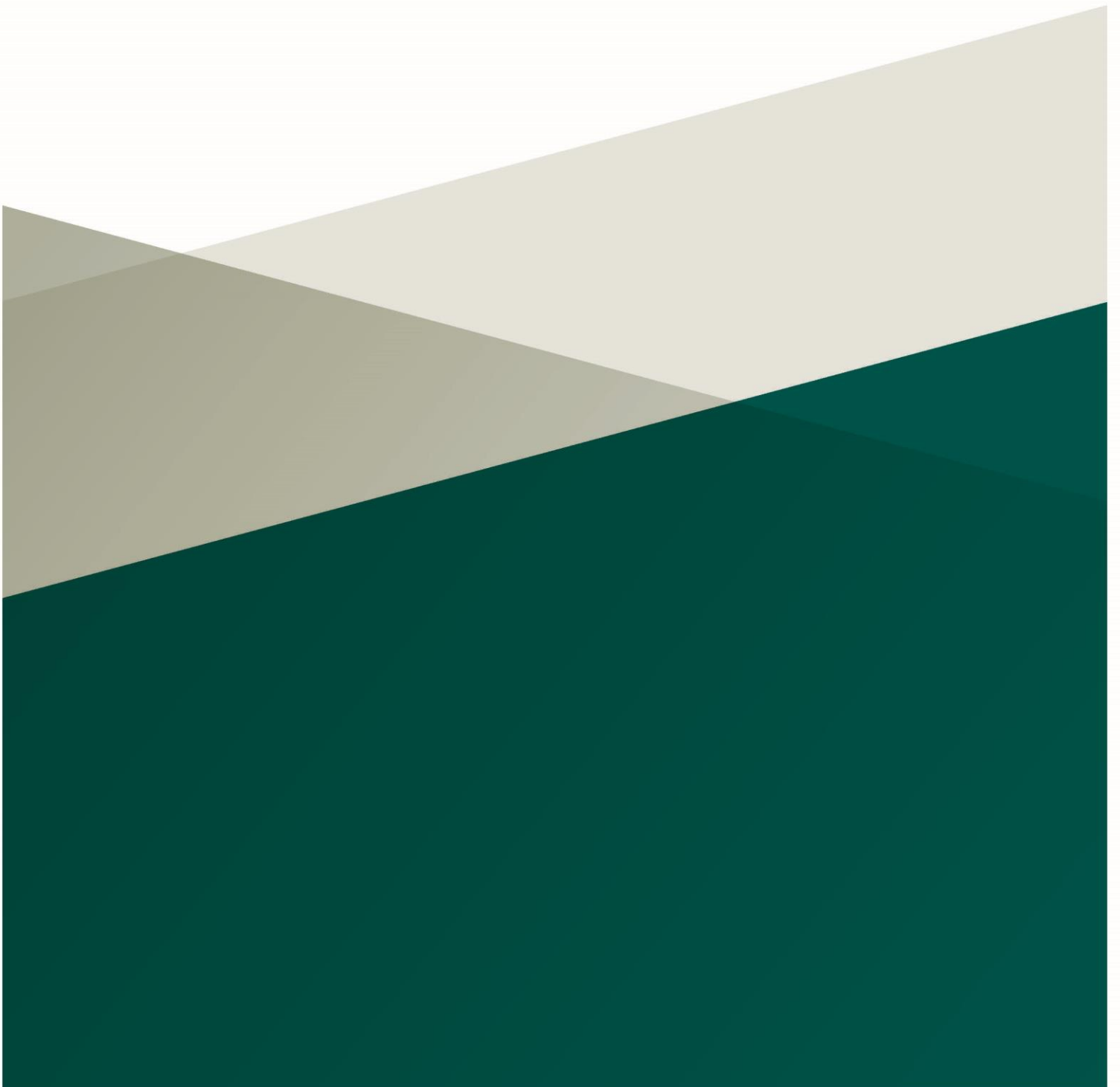




OPW Oifig na
nOibreacha Poiblí
Office of Public Works

Flood Map Update

MR098 Rathdowney



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1 Map Review Programme

The Map Review Programme is the process that the OPW follows to update predictive flood mapping to continue to provide the best available flood risk information to as wide an audience as possible. The Flood Maps have been developed from detailed engineering analysis and modelling. There is always some uncertainty with regard to the accuracy of predictive flood models; however, the detailed models used have been developed using the best available modelling techniques, tools and data at the time of production.

Updates and revisions to the Flood Maps will be prepared as appropriate. Updates to the Flood Maps are considered when one of the below criteria are met:

- A change in the physical conditions since the Flood Map was produced. Examples of potential changes include new infrastructure, a new development, a culvert or bridge upgrade, land raising, channel realignment, etc.
- An error has been identified in the survey. Errors in the survey may include a channel missing or a channel misaligned, or an error in the surveyed levels used.
- Completion of an OPW-funded Flood Relief Scheme or Minor Works Scheme.
- Evidence presented by a recent flood event that calls into question the published Flood Map.
- The completion of a Strategic Flood Risk Assessment, supported by hydraulic modelling, which produces flood maps that are materially different to the OPW published Flood Map.

The Flood Map Review Programme covers Flood Maps produced by the National Catchment Flood Risk Assessment and Management Programme (CFRAM) and other projects that produce detailed productive flood mapping as published on www.floodinfo.ie. The CFRAM Programme was the principle vehicle to deliver on Ireland's commitments under the EU Floods Directive (2007/60/EC). The EU Floods Directive also requires that the Member States review and if necessary update the flood maps on a six-yearly cycle; the Map Review Programme is the process that satisfies this requirement.

The review of indicative national mapping datasets such as the outputs of the National Indicative Fluvial Mapping study and the National Coastal Flood Hazard Mapping are not considered as part of the Map Review Programme.

2 Request Assessment

2.1 Overview

Flood Maps were produced for Rathdowney and its environs as part of the South Eastern CFRAM study under the National CFRAM programme. The Flood Maps for this location were finalised in 2017 and are informed by topographical survey data captured between 2012 and 2013.

This Map Review was identified from within the OPW. The CFRAM Flood Map extents show a portion of the M8 motorway being at risk of flooding, approximately 2km south of Exit 3. The watercourse associated with this flood extent is the Erkina River, which is a tributary to the River Nore. The M8 Motorway was completed prior to the production of the CFRAM project and has been captured in the CFRAM cross section surveys. See Figure 1 for an overview of the site location.

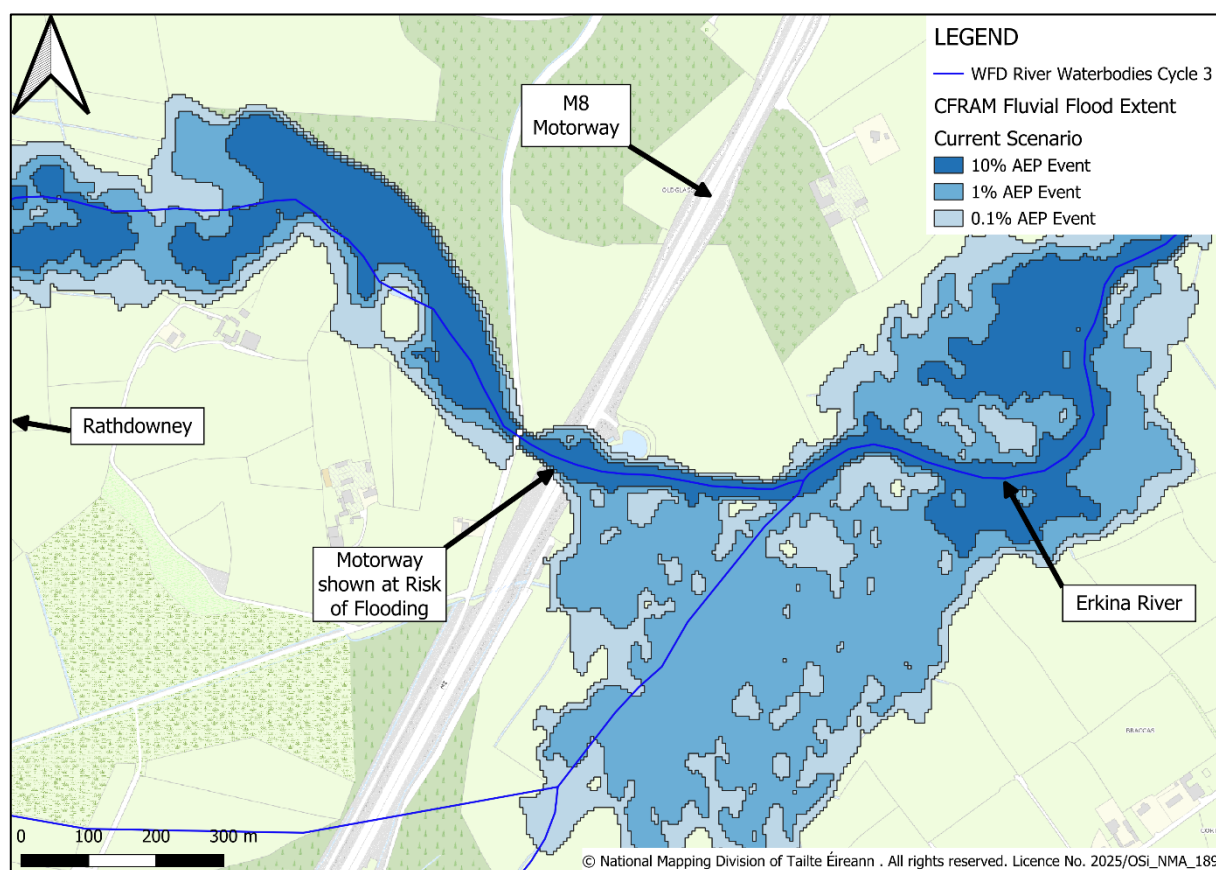


Figure 1: Site Location Overview

The OPW will only carry out a Map Review when the information provided supports one of the criteria described in Section 1. In the case of Rathdowney, an error was identified in the flood extents. The CFRAM flood maps show a portion of the M8 Motorway within all flood extents for the Current Scenario, Mid-Range Future Scenario (MRFS) and High-End Future Scenario (HEFS). However, the elevation differences between the road surface of the motorway and the flood levels produced by the CFRAM model brings into question the accuracy of the flood extents overlapping the motorway as shown in Figure 1.

2.2 Initial assessment

The location this Map Review relates to is where the M8 Motorway traverses the Erkina River. This section of the Erkina River is categorised as a Medium Priority Watercourse (MPW). A review of the max flood levels and the levels of the motorway at this location indicate that the motorway should not be within the flood extents, as shown, and that an update to the extents is warranted.

3 Map Update

3.1 The CFRAM Model

The CFRAM river channel cross-section survey took place in 2012/2013. In this survey, the motorway and the bridge were captured. See an image of the motorway infrastructure in Figure 2.

Figure 4.3.6: Model Schematic MPW – Critical Structures (B) of the CFRAM Hydraulics Report shows the motorway bridge in the model schematics as cross-section 15ERKI00892D. The bridge wasn't explicitly modelled as a structure but the motorway embankments and bridge were accounted for in the 15ERKI00892D cross-section.



Figure 2: 15ERKI00892D_DS photo from CFRAM channel survey 2012-2013

The South Eastern CFRAM Study developed a fluvial hydraulic model at Rathdowney in 2017, which encompasses the Erkina River and associated tributaries. The section of the Erkina River which is under review in this report has been modelled as 1D using the MIKE suite of software, as it is designated as a MPW.

An assessment was completed on the CFRAM flood levels immediately upstream of the road bridge. Table 1 shows these flood levels, produced by the CFRAM hydraulic model. The flood levels for all AEPs and scenarios were checked.

Table 1: CFRAM flood levels immediately upstream of the M8 Road Bridge 15ERKI00892D

Scenario	AEP (%)	Surface Elevation (m.O.D)
Current	50%*	77.3914
Current	20%*	77.5087
Current	10%*	77.5450
Current	5%*	77.5921
Current	2%	77.6631
Current	1%	77.7229
Current	0.5%	77.7899
Current	0.1%	77.9590
MRFS	50%*	77.5042
MRFS	20%*	77.5768
MRFS	10%	77.6337
MRFS	5%	77.6994
MRFS	2%	77.7829
MRFS	1%	77.8405
MRFS	0.5%	77.9192
MRFS	0.1%	78.1982
HEFS	10%	77.7349
HEFS	1%	77.9877
HEFS	0.1%	78.4693

According to survey drawing P635-15ERKI-XS-006, taken as part of the CFRAM channel survey, the motorway road levels at the bridge vary between 83.60mOD and 83.96mOD.

Another dataset was utilized to verify the road surface level in the vicinity of the Erkina River flood extent. LiDAR coverage was captured by Transport Infrastructure Ireland (TII) along the M8 Motorway between May 2010 and May 2011. See Figure 3 below. The LiDAR data shows the road level of the motorway to be above 82mOD in the vicinity of the Erkina River flood extent.

As the motorway road level is well over 4m above the HEFS 0.1% AEP event, the CFRAM flood maps will be updated by removing the motorway from the flood extents for all scenarios. The error in the original mapping is likely due to poor interpolation / post-processing of the 1D model results.

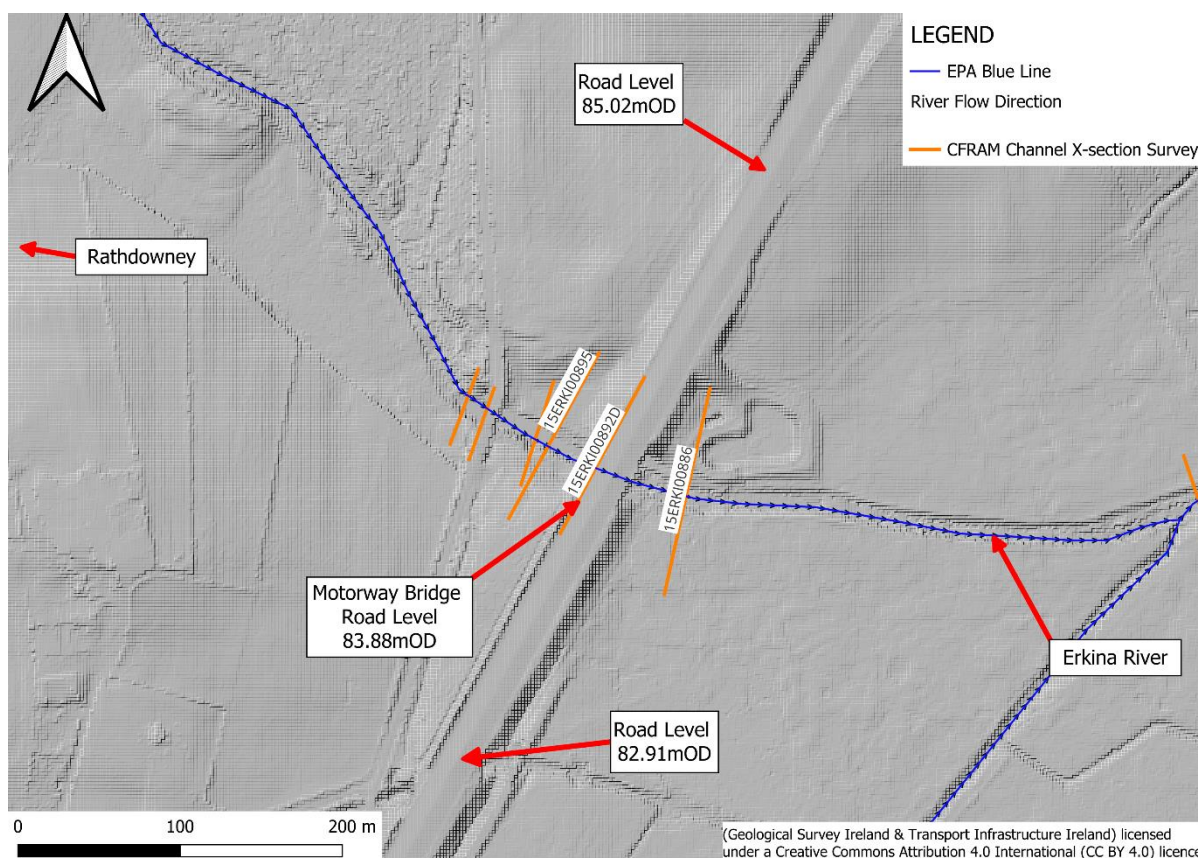


Figure 3: TII LiDAR Coverage along M8 Motorway

3.2 Updates to the Flood Maps

The CFRAM flood extents, depths, velocities, and zone maps were updated in the location where the M8 Motorway traverses the Erkina River. The GIS data was updated by cutting out the motorway and its embankments from all flood extents.

Figure 4 displays a comparison between the CFRAM flood extents and the updated flood extents for the current scenario. This shows the M8 Motorway omitted from the flood extents.

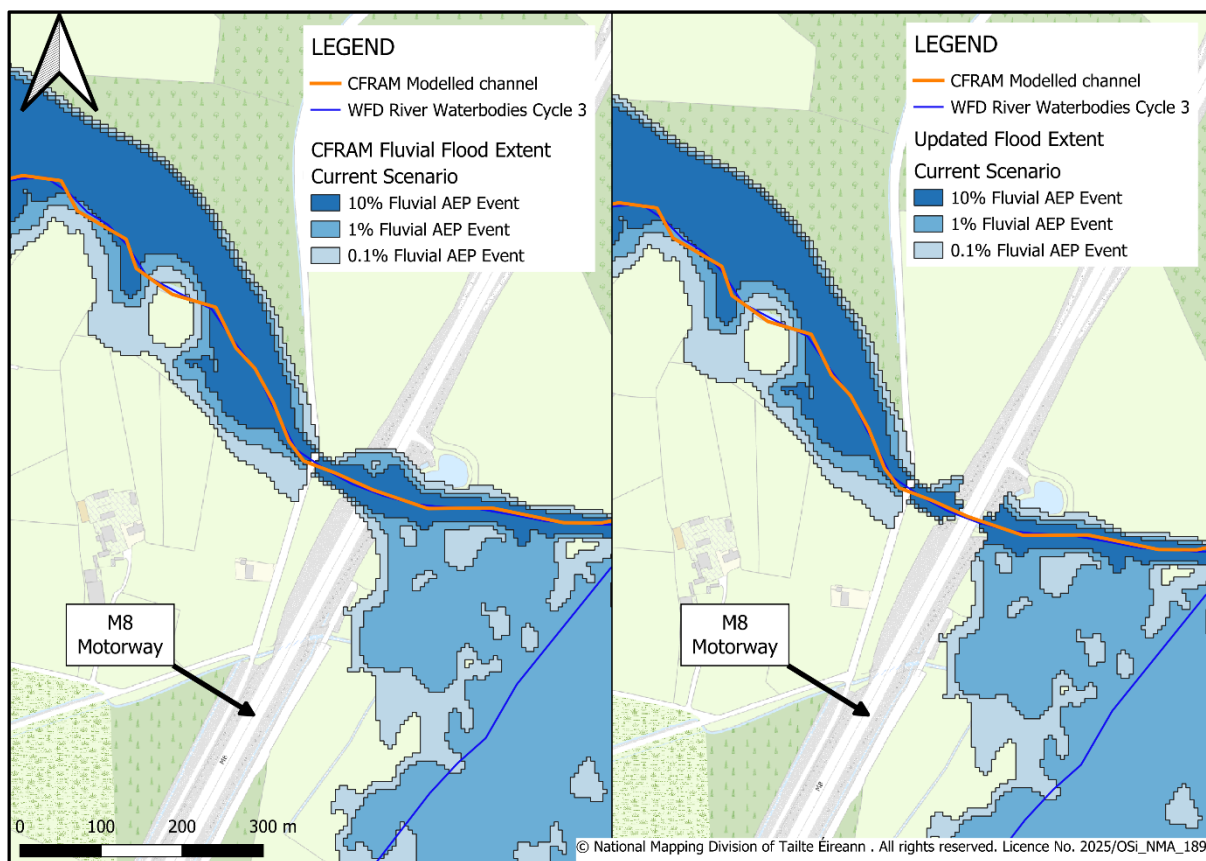


Figure 4: Side by side comparison of the 10%, 1%, & 0.1% AEP Fluvial Flood Maps

4 Conclusion

The Fluvial Flood Maps have been updated by removing the M8 Motorway and its embankments from all flood extents. After reviewing the flood levels produced by the CFRAM hydraulic model, it was determined the flood levels were below the road level of the motorway for all events and scenarios. The updated Flood Maps can be viewed on www.floodinfo.ie.