

Location: Bruff, Co. Limerick		Unique ID: 242701 (from PFRA database)	
Initial OPW Designation	APSR <input type="checkbox"/>	AFRR <input checked="" type="checkbox"/>	IRR <input type="checkbox"/>
Co-ordinates	Easting: 162739	Northing: 135960	
River / Catchment / Sub-catchment	Morningstar River/ Maigne Catchment		
Type of Flooding / Flood Risk (identify all that apply)	Fluvial non-tidal <input checked="" type="checkbox"/> Fluvial tidal <input type="checkbox"/> Coastal <input type="checkbox"/>		

Stage 1: Desktop Review	
1.1 Flood History (include review of Floodmaps.ie)	<p>River Flow Path</p> <p>Morningstar River flows through the town to the south of most of the developed areas.</p> <p>Flood event records</p> <p>Minutes of meeting identifying areas subject to flooding (Croom Area Engineer):</p> <ul style="list-style-type: none"> Bruff - Morningstar River, near waterfall (can be seen from local road south of river, u/s of Main St). Reports of bad flooding a number of years ago. Seems to have been a one off event. A number of houses affected at the time.
1.2 Relevant information on flooding issues from OPW and LA staff	<p>PFRA database comments (<i>in italics</i>):</p> <p>OPW comments</p> <p>LA comments <i>Development down to the river stopped due to funding issue. Sewerage treatment plant effected by flooding. Important in terms of planning(pm) Limerick to be a submission LA Sub" North South Commuter Route crossing bridge. Bridge is a pinchpoint.</i></p> <p>Meeting / discussion summary comments:</p> <p>OPW comments</p> <ul style="list-style-type: none"> No OPW assets in town. Channel is maintained by OPW e.g. vegetation clearance and tree cutting. Channel maintenance also between the two main bridges. Development pressure in some areas. <p>LA comments</p> <ul style="list-style-type: none"> Not aware of any significant issues (spoke with area engineer to confirm). In the past, trees have blocked the bridge reducing its capacity. The WWTW has never flooded.

1.4 PFRA Data			
1.4.1 PFRA hazard mapping	PFRA mapping available in GIS layer:		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
	PFRA mapping included on FRR map:		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1.4.2 Summary of Principal Receptors	Type	FRI score (if available)	
	Receptors not considered as part of the PFRA process. FRI score not calculated in PFRA		
1.7 Stage 1 Evaluation	Aspect	Clearly APSR	Uncertain
	Flood History (1.1)		X
	OPW / LA Information (1.2)		X
	PFRA Evaluation (1.4)		X
	Overall Desktop Evaluation (if any above aspect is uncertain then overall designation is uncertain)		X
1.8 Proposed level of assessment for Stage 2 site visits	Level A Site Visit		X
	Level B Site Visit		

Stage 2: Site Inspection		Level A Assessment		
Date and Time of Inspection		Date: 29/03/11		
		Time: 13:50		
Names of inspection team (including OPW/LA staff if present)		Iain Blackwell		
		Kelly Kasperczyk		
2.1 Ground-truthing of Hazard Mapping	Fluvial non-tidal <input checked="" type="checkbox"/> Fluvial tidal <input type="checkbox"/> Coastal <input type="checkbox"/> Not available <input type="checkbox"/> General shape reasonable, but specific delineation unlikely.			
2.2 Spot check ground-truthing of selected receptor vulnerability (also note any key receptors noted during visit that are not identified by PFRA)	Receptor Type	Location description (if not obvious)	Exists?	Overall Vulnerability / Risk (L / M / H)
	Monuments	Various	Yes	Low – nothing significant
	WWTW	D/s of both bridges on Right Bank	Yes	High
	Houses	Small number on left and right bank	Yes	Low
2.3 Local knowledge - on-site comments (OPW, LA and any info volunteered by local residents during visit)	No on site comments			
2.4 Comments on hydraulic constrictions (bridges, etc.) and conveyance routes	Two main multi-arch bridges through town. Upstream bridge (5-arch) is more of a constriction than the d/s bridge (2-arch). Skew angle and approach of water to u/s bridge will give significant hydraulic losses. Flow almost parallel across the entrance to the two left hand arches. Conveyance restricted in places due to vegetation. No alternative conveyance routes.			

2.5 SVRS Assessment Matrix

Weightings:

A - x1 - reasonable expectation of flooding

B - x2 - high expectation of flooding
or flooding is tidal (any risk)

C - x5 - risk to life

Approx. Number	1 to 4				5 to 20				>20			
Weighting		A	B	C		A	B	C		A	B	C
Property (domestic)	10	X			100				200			
Property (small retail or business)	20				200				400			
Property (large retail or business)	50				500				1000			
Road or Rail Infrastructure	30	X			300				600			
Critical Infrastructure (local) [hospital, school, police/fire/ambulance station, substation, WTW/WWTW, gov bldg, other (specify)]	50	X			500				1000			
Critical Infrastructure (national importance)	250				1000				2000			
Cultural Heritage Site	20				200				400			
Environmental Designated Site	20				200				400			
Hazardous Substances Site	50				500				1000			
Total SVRS									90			

2.6 Defence Assets

Formal and Informal Flood Defence Assets

(include effective and ineffective assets to inform asset survey and potential mitigation measures)

Open Channel Watercourses

Man-made river channel ☐ Flood relief channel ☐ Canal ☐
Mill leat ☐ Drainage channels / back drains ☐

Bridges and Culvert crossings

Single Arch bridge ☐ Multi-Arch bridge ☒
Single Span bridge ☐ Multi-Span bridge ☐
Box culvert(s) ☐ Pipe culvert(s) ☐ Arch Culvert(s) ☐

Culverted Watercourses (culvert length is greater than just a crossing)

Box culvert(s) ☐ Pipe culvert(s) ☐ Arch Culvert(s) ☐ Irregular Culvert(s) ☐

Walls and Embankments

Embankment(s) ☐ Raised wall(s) ☒ Retaining wall(s) ☐

Control Structures – weirs, gates, dams

Fixed crest weir ☐ Adjustable weir ☐ Dam / Barrage ☐
Sluice gates ☐ Lock gates ☐ Radial gates ☐

Storage

On-line storage (natural) ☒ On-line storage (artificial) ☐ Off-line storage ☐

	Outfalls Flapped outfall(s) into watercourse <input type="checkbox"/> Unflapped outfall(s) into watercourse <input type="checkbox"/> <i>i.e. from smaller watercourses, drains etc. into river / estuary / sea</i> Tidal flap(s) <input type="checkbox"/> Tidal sluice(s) <input type="checkbox"/> <i>i.e. from main watercourse into estuary / sea</i> Other Pumping Station <input type="checkbox"/> Erosion Protection <input type="checkbox"/> Sand Dunes <input type="checkbox"/> Additional notes (if required): Informal flood defence walls between 2 bridges and u/s on left bank for approx 400m. Appears to be an effective flood defence asset.
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2.8 Initial Potential Mitigation Measures

Non-structural measures	Planning and Development control <input checked="" type="checkbox"/> Sustainable Urban Drainage Systems <input type="checkbox"/> Flood forecasting / warning <input type="checkbox"/> Change in Operating Procedures for water level control: <input type="checkbox"/> Public awareness campaign <input type="checkbox"/> Individual property protection <input type="checkbox"/> Land use management <input type="checkbox"/>
Structural measures	Strategic development management for floodplain development: <input type="checkbox"/> <i>(integration of measures into strategic development proposals)</i> Storage: On-line <input checked="" type="checkbox"/> Off-line <input type="checkbox"/> Flow diversion: Flood relief channel <input type="checkbox"/> Flood relief culvert <input type="checkbox"/> Increase conveyance: Bridge works <input checked="" type="checkbox"/> Channel works <input checked="" type="checkbox"/> Floodplain <input checked="" type="checkbox"/> Flood defences: Walls <input checked="" type="checkbox"/> Embankments <input checked="" type="checkbox"/> Localised works: Defence raising <input type="checkbox"/> In-fill gaps <input checked="" type="checkbox"/> Trash screen <input type="checkbox"/> Maintenance works: Culvert / channel clearance <input checked="" type="checkbox"/> Asset maintenance <input type="checkbox"/> Relocation of properties: <input type="checkbox"/> Improve existing defences: <input type="checkbox"/> (describe) Other (describe):

Outcomes				
PFRA Designation	APSR <input checked="" type="checkbox"/> not an APSR <input type="checkbox"/> IRR <input type="checkbox"/>		FRI Score: N/A	
Site Ground-truthing of PFRA Assessment (hazard mapping and receptors)	High Confidence (good)	Uncertain	Low Confidence (poor)	Not available
		X		
Site Visit Review Score	90			
Recommended Designation	APSR <input type="checkbox"/> not an APSR <input checked="" type="checkbox"/> IRR <input type="checkbox"/>			
Summary Comments (if required)	There are a small number of properties at risk on the right bank upstream of the bridges. Protection is currently provided to a few properties on the left bank, through an informal flood defence wall. In the event that the informal defence failed, these properties would be at risk. Total number of properties at risk is likely to be around 4-6 in total, plus a WWTP downstream. It is recommended NOT to be designated as an APSR.			



Photo 1: River in between the two main bridges in Bruff, looking d/s. The wall on the left bank (informal defence) provides protection to properties on the left bank under extreme events.



Photo 2: Upstream side of the u/s bridge. Skew angle, channel vegetation and restrictive arches would lead to significant head loss across the bridge in high flows. Wall on left (informal defence) provides protection to left bank.



Photo 3: River u/s of the most upstream bridge. Incomplete development on right bank potentially at risk of flooding.



Photo 4: Informal flood defence asset on the left bank, u/s of the most upstream bridge in Bruff.

