

Location: Listowel, Co. Kerry		Unique ID: 230357 (from PFRA database)	
Initial OPW Designation	APSR <input type="checkbox"/>	AFRR <input checked="" type="checkbox"/>	IRR <input type="checkbox"/>
Co-ordinates	Easting: 98500		Northing: 133000
River / Catchment / Sub-catchment	River Feale / Feale 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>The River Feale flows from east to west, to the south of Listowel town. A five arched bridge traverses the River Feale at the entrance to the Town from the Abbeyfeale and Tralee approach roads to the south of the Town. According to the EPA Mapper a stream (EPA order 1-2) runs through Listowel and joins the River Feale at Church St, this stream is not mapped on the OSI maps.</p> <p>Flood Records</p> <p>One singular flood record is listed with two reports (limited detail available). The recorded flood event is outside the main town area, located north-west in Curraghatoosane. This record refers to house flooding.</p> <p>From the Local Area Plan:</p> <ul style="list-style-type: none"> At present many of the sewers in the town centre are combined foul and storm water sewers. This results in the sewerage system exceeding capacity at times of intense rainfall. Listowel Town Council will facilitate the OPW in the preparation of a CFRAM Plan for Listowel and the River Feale.
1.2 Relevant information on flooding issues from OPW and LA staff	<p>PFRA database comments (<i>in italics</i>):</p> <p>OPW comments <i>Flood Defences refurbished in 2008, large residential development in flood plain.</i></p> <p>LA comments <i>Flooding in Listowel is linked to inadequate provision of storm sewers, not as far as LA know to fluvial or tidal issues.</i></p> <p>Meeting / discussion summary comments:</p> <p>OPW comments</p> <ul style="list-style-type: none"> Flooding on loop behind embankment on the left bank. Embankment built 2-3 years ago u/s of main bridge. Kerry Co-op Foods potentially at risk on left bank. Properties at risk on road west, with river to the south. These are likely to be outside the APSR boundary. Other properties possibly at risk further west outside of Listowel. Major development allocations.

	LA comments <ul style="list-style-type: none"> Main flood risk appears to be the new developments in the meander through town. Area is defended with embankment. This area historically flooded regularly (before it was protected with an embankment). No known flood risk areas out of town. 		
1.4 PFRA Data			
1.4.1 PFRA hazard mapping	PFRA mapping available in GIS layer: PFRA mapping included on FRR map:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
1.4.2 Summary of Principal Receptors	Type Arch (RW) Arch (RW) Total	Number (approx.) 	FRI score (if available) 130.8 0.25 1116.75
1.7 Stage 1 Evaluation	Aspect Flood History (1.1) OPW / LA Information (1.2) PFRA Evaluation (1.4) Overall Desktop Evaluation (if any above aspect is uncertain then overall designation is uncertain)	Clearly APSR 	Uncertain X X X X
1.8 Proposed level of assessment for Stage 2 site visits	Level A Site Visit Level B Site Visit	X	

Stage 2: Site Inspection		Level A Assessment		
Date and Time of Inspection		Date: 26/05/11		
		Time: 10:30		
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"/>			
	<p>Some areas of the hazard mapping appear over-estimated, e.g. “wedges” to the west of Listowel are up on very high ground, well above the river on the right bank where there is no flood plain.</p> <p>Flood outline shown behind embankments appears to assume that the embankments are not in place. It is considered that with embankments in place here (approximately 1.5m higher than flood plain behind defences), the flood risk is considerably reduced.</p> <p>“Dog leg” shaded area to the north of Main Street (N69) does not appear to be represent site conditions.</p> <p>General outline in most other areas appears reasonable.</p>			
2.2 Spot check ground-truthing of selected receptor vulnerability	Receptor Type	Location description (if not obvious)	Exists?	Overall Vulnerability / Risk (L / M / H)
(also note any key receptors noted during visit that are not identified by PFRA)	Houses	Primarily behind embankments to SW of Main Street.	Yes	M – assuming embankment not in place
2.3 Local knowledge - on-site comments (OPW, LA and any info volunteered by local residents during visit)	Discussion with local resident and former council worker indicated worst flood was in 1972. The areas now protected by embankment (on the right bank) used to flood regularly.			
2.4 Comments on hydraulic constrictions (bridges, etc.) and conveyance routes	<p>Five arch bridge on the main road out of Listowel to the east would give some head loss across it although arches are large.</p> <p>Footbridge across to racecourse. Head loss across this bridge during site visit was approx. 0.5m during fairly low flow.</p> <p>No alternative conveyance routes, although out of bank flows on the left bank adjacent to the racecourse could “cut off” part of the bend.</p>			

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				100				200	X		
Property (small retail or business)	20				200				400			
Property (large retail or business)	50	X			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				500				1000			
Critical Infrastructure (national importance)	250				1000				2000			
Cultural Heritage Site	20	X			200				400			
Environmental Designated Site	20				200				400			
Hazardous Substances Site	50				500				1000			
Total SVRS									300			

2.6 Defence Assets

Formal and Informal Flood Defence Assets <i>(include effective and ineffective assets to inform asset survey and potential mitigation measures)</i>	Open Channel Watercourses Man-made river channel <input type="checkbox"/> Flood relief channel <input type="checkbox"/> Canal <input type="checkbox"/> Mill leat <input type="checkbox"/> Drainage channels / back drains <input type="checkbox"/>		
	Bridges and Culvert crossings Single Arch bridge <input type="checkbox"/> Multi-Arch bridge <input checked="" type="checkbox"/> Single Span bridge <input type="checkbox"/> Multi-Span bridge <input checked="" type="checkbox"/> Box culvert(s) <input type="checkbox"/> Pipe culvert(s) <input type="checkbox"/> Arch Culvert(s) <input checked="" type="checkbox"/>		
	Culverted Watercourses (culvert length is greater than just a crossing) Box culvert(s) <input type="checkbox"/> Pipe culvert(s) <input checked="" type="checkbox"/> Arch Culvert(s) <input type="checkbox"/> Irregular Culvert(s) <input type="checkbox"/>		
	Walls and Embankments Embankment(s) <input checked="" type="checkbox"/> Raised wall(s) <input checked="" type="checkbox"/> Retaining wall(s) <input type="checkbox"/>		
	Control Structures – weirs, gates, dams Fixed crest weir <input type="checkbox"/> Adjustable weir <input type="checkbox"/> Dam / Barrage <input type="checkbox"/> Sluice gates <input type="checkbox"/> Lock gates <input type="checkbox"/> Radial gates <input type="checkbox"/>		
	Storage On-line storage (natural) <input type="checkbox"/> On-line storage (artificial) <input type="checkbox"/> Off-line storage <input type="checkbox"/>		

	<p>Outfalls Flapped outfall(s) into watercourse <input checked="" type="checkbox"/> Unflapped outfall(s) into watercourse <input checked="" 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></p> <p>Other Pumping Station <input type="checkbox"/> Erosion Protection <input type="checkbox"/> Sand Dunes <input type="checkbox"/></p> <p>Additional notes (if required):</p> <ul style="list-style-type: none"> The arch culvert on Upper Church St has a twin trash screen in place. Arch culvert opens underneath a house here. There is a flap on right bank of the Feale River u/s of the multi-span bridge to the racetrack. The channel at the flap extends under the embankment of the right bank to drain the area behind the embankment. A flood defence wall is located u/s of the Main Street bridge on the right bank. This wall ties in with the embankments.
<p>2.8 Initial Potential Mitigation Measures</p>	
<p>Non-structural measures</p>	<p>Planning and Development control <input checked="" type="checkbox"/> Sustainable Urban Drainage Systems <input type="checkbox"/> Flood forecasting / warning <input checked="" type="checkbox"/> Change in Operating Procedures for water level control: <input type="checkbox"/> Public awareness campaign <input checked="" type="checkbox"/> Individual property protection <input type="checkbox"/> Land use management <input type="checkbox"/></p>
<p>Structural measures</p>	<p>Strategic development management for floodplain development: <input type="checkbox"/> <i>(integration of measures into strategic development proposals)</i></p> <p>Storage: On-line <input type="checkbox"/> Off-line <input type="checkbox"/></p> <p>Flow diversion: Flood relief channel <input type="checkbox"/> Flood relief culvert <input type="checkbox"/></p> <p>Increase conveyance: Bridge works <input type="checkbox"/> Channel works <input type="checkbox"/> Floodplain <input type="checkbox"/></p> <p>Flood defences: Walls <input type="checkbox"/> Embankments <input checked="" type="checkbox"/></p> <p>Localised works: Defence raising <input checked="" type="checkbox"/> In-fill gaps <input type="checkbox"/> Trash screen <input type="checkbox"/></p> <p>Maintenance works: Culvert / channel clearance <input checked="" type="checkbox"/> Asset maintenance <input checked="" type="checkbox"/></p> <p>Relocation of properties: <input type="checkbox"/></p> <p>Improve existing defences: <input type="checkbox"/> (describe)</p> <p>Other (describe): Embankment and wall upstream on main bridge on right bank: Further consideration to raising this defence; possibly by raising the road under the small arch immediately next to the town side of the bridge. This road level here (i.e. under the arch) appears to be low spot on the defence on the right bank.</p>

<p>Outcomes</p>				
<p>PFRA Designation</p>	<p>APSR <input checked="" type="checkbox"/> not an APSR <input type="checkbox"/> IRR <input type="checkbox"/></p>		<p>FRI Score: 1116</p>	
<p>Site Ground-truthing of PFRA Assessment (hazard mapping and receptors)</p>	<p>High Confidence (good)</p>	<p>Uncertain</p>	<p>Low Confidence (poor)</p>	<p>Not available</p>
		<p>X</p>		
<p>Site Visit Review Score</p>	<p>300</p>			
<p>Recommended Designation</p>	<p>APSR <input checked="" type="checkbox"/> not an APSR <input type="checkbox"/></p>		<p>IRR <input type="checkbox"/></p>	

Summary Comments (If required)	Areas potentially vulnerable to fluvial flooding are protected by embankments. In the event of a breach, a significant number of properties would be at risk to flooding. This is the primary reason for Listowel being identified as an APSR, even though the current embankment appears to provide a good level of protection.
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Photo 1: U/s of the River Feale looking east at the bridge crossing



Photo 2: Defences upstream of the bridge on the right bank preventing flow along the main road through Listowel (1)



Photo 3: Defences upstream of the bridge on the right bank preventing flow along the main road through Listowel (2)



Photo 4: Embankment in Listowel protecting many residential properties behind the defence (1)



Photo 5: Embankment in Listowel protecting many residential properties behind the defence (2)



Photo 6: Looking d/s to the footbridge over the River Feale, used for access to the racecourse



Photo 7: Kerry Foods factory located on the left bank

