



Comhairle Contae Mhaigh Eo
Mayo County Council



Draft

**Mayo County
Development Plan**

2021 - 2027

**Strategic
Flood Risk
Assessment**

County Mayo Strategic Flood Risk Assessment

Live Document

December 2020

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Comhairle Contae Mhaigh Eo
Mayo County Council

Mayo County Council

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Abbreviations

1D	One Dimensional (modelling)
2D	Two Dimensional (modelling)
AEP	Annual Exceedance Probability
AFA	Area for Further Assessment
CDP	County Development Plan
CFRAM	Catchment Flood Risk Assessment and Management
DTM	Digital Terrain Model
EPA	Environmental Protection Agency
FFL	Finished Floor Level
FRA	Flood Risk Assessment
FRMP	Flood Risk Management Plan
FRR	Flood Risk Review
FSU	Flood Studies Update
GIS	Geographical Information System
HEFS	High End Future Scenario
HPW	High Priority Watercourse
JFLOW	2-D hydraulic modelling package developed by JBA
JT	Justification Test
LA	Local Authority
MCC	Mayo County Council
MCDP	Mayo County Development Plan
MPW	Medium Priority Watercourse
MRFS	Medium Range Future Scenario
OPW	Office of Public Works
OSi	Ordnance Survey Ireland
PFRA	Preliminary Flood Risk Assessment
RSES	Regional Spatial and Economic Strategy
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems
SPR	Standard percentage runoff
Tp	Time to Peak Definitions

1 Introduction

JBA Consulting was commissioned by Mayo County Council (MCC) to provide assistance in the preparation of the Strategic Flood Risk Assessment (SFRA) to inform the Draft Mayo County Development Plan 2021-2027 (MCDP).

The SFRA is a live document that is designed to be updated as further flood risk information becomes available and changes to the development plan are proposed under any future variations.

1.1 SFRA Legacy in County Mayo

The 2021 MCDP SFRA represents an update to the previous version of the SFRA under the 2014 MCDP.

1.2 Terms of Reference

Under the "Planning System and Flood Risk Management" guidelines, the purpose for a Strategic Flood Risk Assessment (SFRA) is detailed as being "to provide a broad (wide area) assessment of all types of flood risk to inform strategic land-use planning decisions. SFRAs enable the LA to undertake the sequential approach, including the Justification Test, allocate appropriate sites for development and identify how flood risk can be reduced as part of the development plan process".

More specifically the SFRA will complete the following tasks;

1. Undertake a flood risk assessment for the settlements within the MCDP,
2. Review the various sources of potential Flood Zone mapping,
3. Assist MCC in the review of land use zoning objectives and the application of the sequential approach and justification test,
4. Prepare flood risk management policies, objectives and recommendations

1.3 Report Structure

Section 2 provides an introduction to the study area. Section 3 provides an introduction to the Planning System and Flood Risk Management and covers important information on the philosophy and approach of the guidelines.

Section 4 provides a review of data collection, flood history and predicted flood extent (including climate change impacts) in each of the settlements. Section 5 discusses the different sources of flooding in Mayo.

Section 6 provides policy guidance and Section 7 provides guidance on suggested approaches to managing flood risk and development. Section 8 discusses the settlement review.

2 Mayo Study Area

The study area is the County of Mayo, with a focus in the land use zoning objectives of the Tier 2 key towns of Ballinrobe, Ballyhaunis, Béal an Mhuirthead (Belmullet), Claremorris, Swinford. Tier 3, 4 and Tier 5 settlements will also be assessed for flood risk, but they have a generic zoning type that covers the entire settlement boundary. A total of 69 settlements will be assessed as part of this SFRA. All settlements identified in the MCDP are shown in Table 2-1

Table 2-1: Settlements contained within the MCDP 2021 – 2027

Position	Description	Settlement
Tier 1	Strategic Growth Towns	Castlebar, Ballina, Westport
Tier 2	Self-Sustaining Growth Towns	Ballinrobe, Ballyhaunis, Béal an Mhuirthead (Belmullet), Claremorris, Swinford
Tier 3	Self-Sustaining Towns	Balla, Charlestown, Crossmolina, Foxford, Killala, Kiltimagh, Knock, Louisburgh, Newport.
Tier 4	Rural Settlements	Keel-Dooagh, Shrule, Kilkelly, Gob An Choire (Achill Sound), Bangor Erris, Ballindine, Ballycastle, Bunnyconnelan, Bellavary, Kilmaine, Cong, Turlough, Mulranny, Belcarra, Bohola, Lahardane, Irishtown, Dumha Thuama (Doohoma).
Tier 5	Rural Villages	Aghagower, Aghamore, An Tinbhear (Inver), Attymass, Ballycroy, Ballyglass, Ballyheane, Bekan, Breaffy, Brickens, Bun an Churraugh (Bunnacurry), Carnacon, Carracastle, Ceathrú Thaidhg (Carrowteige), Corrchloch (Corclough), Cross, Crossboyne, Doogort, Eachléim (Aghleam), Gaoth Sáile (Gweesalia), Geata Mór (Binghamstown), Gleann na Muaidhe (Glenamoy), Glenhest Glenisland, Hollymount, Islandeady Kilmovee, Knockmore, Mayo Abbey, Moygownagh, Moyne (Kilmeena), Parke, Partry, Poll an tSómas (Pollatomish), Roundfort, The Neale & Tuar Mhic Éadaigh (Tourmakeady).

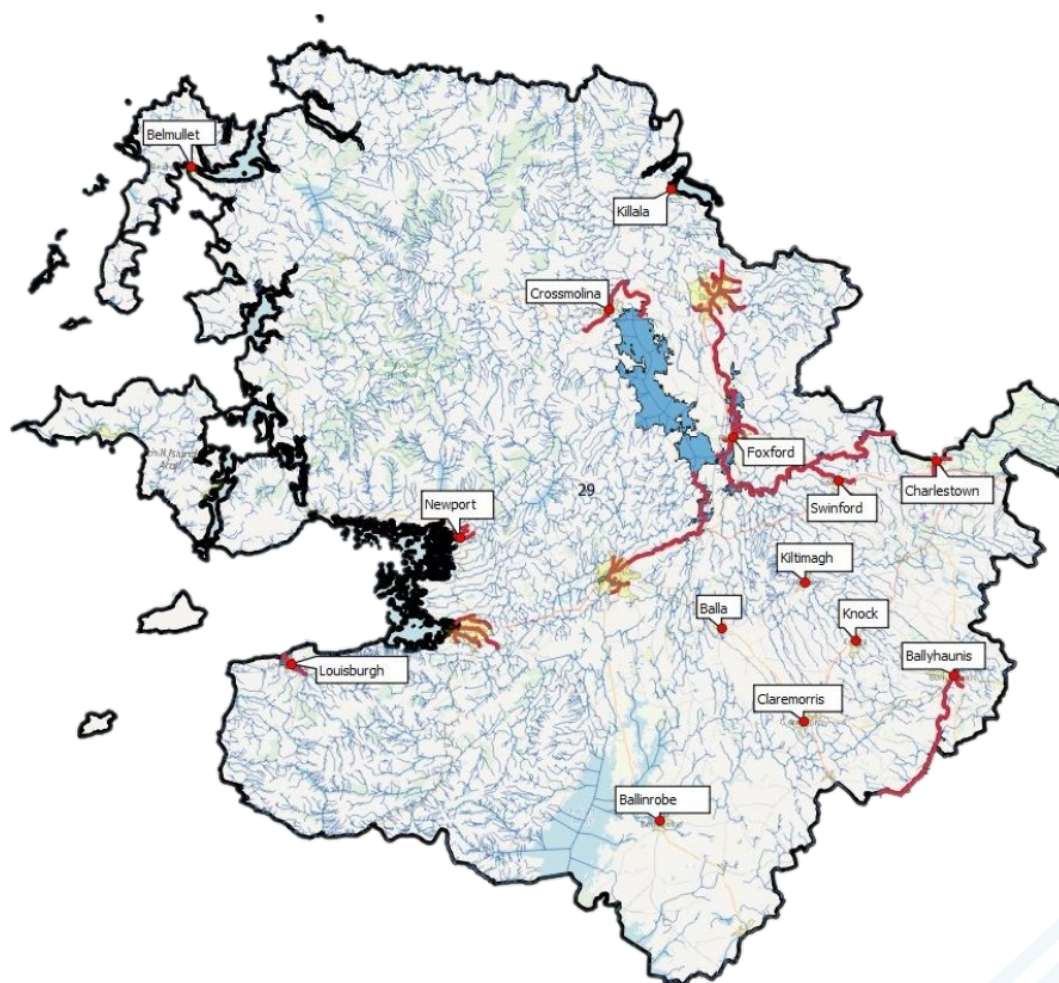


Figure 2-1: Settlement Map

County Mayo is located on the west coast of Ireland. The county has an area of 5,590km². The Nephin Mountains in the west of the county rise to an elevation of approximately 806mOD. The Sheeffry Mountains lie in the south west of the country and range to approximately 700mOD.

Mayo boasts a myriad of lakes and rivers which vary in size. The large limestone lakes include Lough Corrib, Lough Mask, Lough Conn, Lough Cullin and Lough Carra. The most important river in the county is the River Moy, which, fed by 45 smaller tributaries, drains all East Mayo. The other rivers include the Newport River, the Deel, Owenmore, Owenduff, Robe, Aille, Bundarragha and Erriff. Mayo is located within the Western River Basin District.

2.1 Planning Policy

2.1.1 Ireland 2040 – National Planning Framework

A Strategic Flood Risk Assessment of the National Policy Objectives (NPO) within the Ireland 2040 – National Planning Framework was undertaken with the aim of ensuring that flood risk is a key consideration in delivering the proposed strategic sustainable land-use planning decisions. It sets out how all levels of the planning process, from national level strategic assessments to individual planning applications, should follow the sequential approach set out in the 2009 Guidelines on Planning and Flood Risk Management.

The NPF recognises that it is not always possible to avoid developing in flood risk areas due to spatial, economic, environmental and physical constraints. Development should be encouraged to continue, and in flood risk areas should follow the sequential approach and application of Justification Test set out in the Department’s Guidelines on the Planning System and Flood Risk Management. These guidelines will facilitate the integration of flood risk and land risk planning in the Eastern and Midland region, at all tiers of the planning hierarchy from national level through regional, city/county and local plans, masterplans and individual planning applications.

2.1.2 Regional Spatial & Economic Strategy (Northern and Western Regional Assembly)

The Regional Spatial & Economic Strategy (RSES) for the Northern and Western Regional Assembly included a Regional Flood Risk Appraisal Report, undertaken at a high level, but with a view to informing policy decisions within lower tier development plans. The RSES found that an integrated approach to river catchment management is essential to manage and avoid increasing flood risk. The RSES sets out how Development Plans should include Strategic Flood Risk Assessments and all future zoning of land for development in areas at risk of flooding should follow the sequential approach set out in the 2009 Guidelines on Planning and Flood Risk Management (DoEHLG). The inclusion of policies and actions to support Sustainable Urban Drainage Systems is recommended in future developments as a major component of flood management and prevention.

The settlement hierarchy selected by the RSES takes account of the fact that while Ballina and Castlebar, amongst others, is vulnerable to fluvial flooding, wider, effective management of flood risk coupled with wider environmental, sustainability and economic considerations mean that it is possible to facilitate the continued consolidation of the development of the existing urban structure of the region. In line with the sequential and justification criteria set out in the Department’s Guidelines on the Planning System and Flood Risk Management it is considered that these locations should be encouraged to continue to consolidate and to grow in order to bring about a more compact and sustainable urban development form while at the same time managing flood risk appropriately. These guidelines outline measures through which both the flood risk and the continued development of Ballina and Castlebar, Mayo’s key towns and county towns can be reconciled.

The RSES included a number of development plan implications:

- An integrated approach to river catchment management is essential to manage and avoid increasing flood risk. Local authorities should fully support the completion of CFRAM studies and jointly implement any actions identified.
- Development Plans shall include Strategic Flood Risk Assessments and all future zoning of land for development in areas at risk of flooding should follow the sequential approach set out in the 2009 Department Guidelines on Planning and Flood Risk Management.
- Development Plans should include policies on the requirement for Sustainable Drainage Systems (SuDS) or attenuation measures in future developments as a major component of flood management and prevention.

2.1.3 Mayo County Development Plan 2014 – 2020

As part of the Mayo County Development Plan 2014-2020 a Strategic Flood Risk Assessment was undertaken. The purpose of the SFRA is to provide a broad assessment of all types of flood risk to inform strategic land use planning decisions. Parts of County Mayo are vulnerable to flooding and are mapped as part of the Mayo County Development Plan 2014 – 2020.

The aim of the Mayo County Development Plan 2014 – 2020 aims to minimize the level of flood risk to people, business, infrastructure and the environment through the identification of existing and potential future flood risks. MCC proposes to incorporate flood risk management into the decision-making processes for future development in Mayo in an integrated, proactive and transparent manner in line with evolving best practice.

3 The Planning System and Flood Risk Management

3.1 Introduction

Prior to discussing the management of flood risk, it is helpful to understand what is meant by the term. It is also important to define the components of flood risk to apply the principles of the Planning System and Flood Risk Management in a consistent manner.

The Planning System and Flood Risk Management: Guidelines for Planning Authorities, published in November 2009, describe flooding as a natural process that can occur at any time and in a wide variety of locations. Flooding can often be beneficial, and many habitats rely on periodic inundation. However, when flooding interacts with human development, it can threaten people, their property and the environment.

This Section will firstly outline the definitions of flood risk and the Flood Zones used as a planning tool; a discussion of the principles of the planning guidelines and the management of flood risk in the planning system will follow.

3.2 Definition of Flood Risk

Flood risk is generally accepted to be a combination of the likelihood (or probability) of flooding and the potential consequences arising. Flood risk can be expressed in terms of the following relationship:

$$\text{Flood Risk} = \text{Probability of Flooding} \times \text{Consequences of Flooding}$$

The assessment of flood risk requires an understanding of the sources, the flow path of floodwater and the people and property that can be affected. The source - pathway - receptor model, shown below in Figure 3-1, illustrates this and is a widely used environmental model to assess and inform the management of risk.

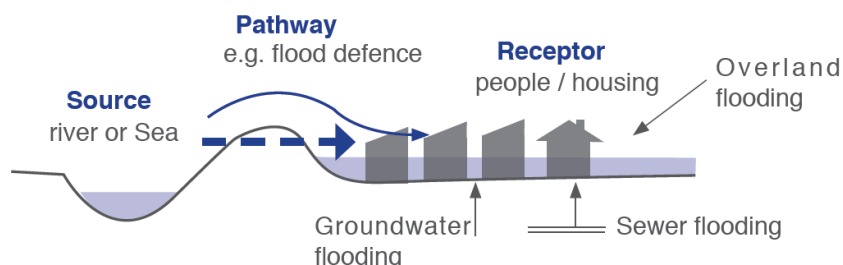


Figure 3-1: Source Pathway Receptor Model

Source: Figure A1 The Planning System and Flood Risk Management Guidelines Technical Appendices

Principal sources of flooding are rainfall or higher than normal sea levels while the most common pathways are rivers, drains, sewers, overland flow and river and coastal floodplains and their defence assets. Receptors can include people, their property and the environment. All three elements must be present for flood risk to arise. Mitigation measures, such as defences or flood resilient construction, have little or no effect on sources of flooding but they can block or impede pathways or remove receptors.

The planning process is primarily concerned with the location of receptors, taking appropriate account of potential sources and pathways that might put those receptors at risk.

3.3 Likelihood of Flooding

Likelihood or probability of flooding of a particular flood event is classified by its annual exceedance probability (AEP) or return period (in years). A 1% AEP flood indicates the

flood event that will occur or be exceeded on average once every 100 years and has a 1 in 100 chance of occurring in any given year.

Return period is often misunderstood to be the period between large flood events rather than an average recurrence interval. Annual exceedance probability is the inverse of return period as shown in Table 3-1.

Table 3-1: Probability of Flooding

Return Period (Years)	Annual Exceedance Probability (%)
2	50
100	1
200	0.5
1000	0.1

Considered over the lifetime of development, an apparently low-frequency or rare flood has a significant probability of occurring. For example:

- A 1% flood has a 22% (1 in 5) chance of occurring at least once in a 25-year period - the period of a typical residential mortgage;
- And a 53% (1 in 2) chance of occurring in a 75-year period - a typical human lifetime.

3.4 Consequences of Flooding

Consequences of flooding depend on the hazards caused by flooding (depth of water, speed of flow, rate of onset, duration, wave-action effects, water quality) and the vulnerability of receptors (type of development, nature, e.g. age-structure, of the population, presence and reliability of mitigation measures etc).

The Planning System and Flood Risk Management guidelines provide three vulnerability categories, based on the type of development, which are detailed in Table 3.1 of the Guidelines, and are summarised as:

- **Highly vulnerable**, including residential properties, essential infrastructure and emergency service facilities;
- **Less vulnerable**, such as retail and commercial and local transport infrastructure;
- **Water compatible**, including open space, outdoor recreation and associated essential infrastructure, such as changing rooms.

3.5 Definition of Flood Zones

In the Planning System and Flood Risk Management guidelines, Flood Zones are used to indicate the likelihood of a flood occurring. These Zones indicate a high, moderate or low probability of flooding from fluvial or tidal sources and are defined below in Table 3-2.

It is important to note that the definition of the Flood Zones is based on an undefended scenario and does not consider the presence of flood protection structures such as flood walls or embankments. This is to allow for the fact that there is a residual risk of flooding behind the defences due to overtopping or breach and that there may be no guarantee that the defences will be maintained in perpetuity.

It is also important to note that the Flood Zones indicate flooding from fluvial and tidal sources and do not take other sources, such as groundwater or pluvial, into account, so an assessment of risk arising from such sources should also be made.

Table 3-2: Definition of Flood Zones

Zone	Description
Zone A High probability of flooding.	This zone defines areas with the highest risk of flooding from rivers (i.e. more than 1% probability or more than 1 in 100) and the coast (i.e. more than 0.5% probability or more than 1 in 200).
Zone B Moderate probability of flooding.	This zone defines areas with a moderate risk of flooding from rivers (i.e. 0.1% to 1% probability or between 1 in 100 and 1 in 1000) and the coast (i.e. 0.1% to 0.5% probability or between 1 in 200 and 1 in 1000).
Zone C Low probability of flooding.	This zone defines areas with a low risk of flooding from rivers and the coast (i.e. less than 0.1% probability or less than 1 in 1000).

3.6 Objectives and Principles of the Planning Guidelines

The Planning System and Flood Risk Management Guidelines describe good flood risk practice in planning and development management. Planning authorities are directed to have regard to the guidelines in the preparation of Development Plans and Local Area Plans, and for development control purposes.

The objective of the Planning System and Flood Risk Management Guidelines is to integrate flood risk management into the planning process, thereby assisting in the delivery of sustainable development. For this to be achieved, flood risk must be assessed as early as possible in the planning process. Paragraph 1.6 of the Guidelines states that the core objectives are to:

- "avoid inappropriate development in areas at risk of flooding;
- avoid new developments increasing flood risk elsewhere, including that which may arise from surface run-off;
- ensure effective management of residual risks for development permitted in floodplains;
- avoid unnecessary restriction of national, regional or local economic and social growth;
- improve the understanding of flood risk among relevant stakeholders; and
- ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management".

The guidelines aim to facilitate 'the transparent consideration of flood risk at all levels of the planning process, ensuring a consistency of approach throughout the country.' SFRAs therefore become a key evidence base in meeting these objectives.

The 'Planning System and Flood Risk Management' works on several key principles, including:

- Adopting a staged and hierarchical approach to the assessment of flood risk;
- Adopting a sequential approach to the management of flood risk, based on the frequency of flooding (identified through Flood Zones) and the vulnerability of the proposed land use.

3.7 The Sequential Approach and the Justification Test

Each stage of the Flood Risk Assessment (FRA) process aims to adopt a sequential approach to management of flood risk in the planning process.

Where possible, development in areas identified as being at flood risk should be avoided; this may necessitate de-zoning lands within the development plan. If de-zoning is not possible, then rezoning from a higher vulnerability land use, such as residential, to a less vulnerable use, such as open space may be required.

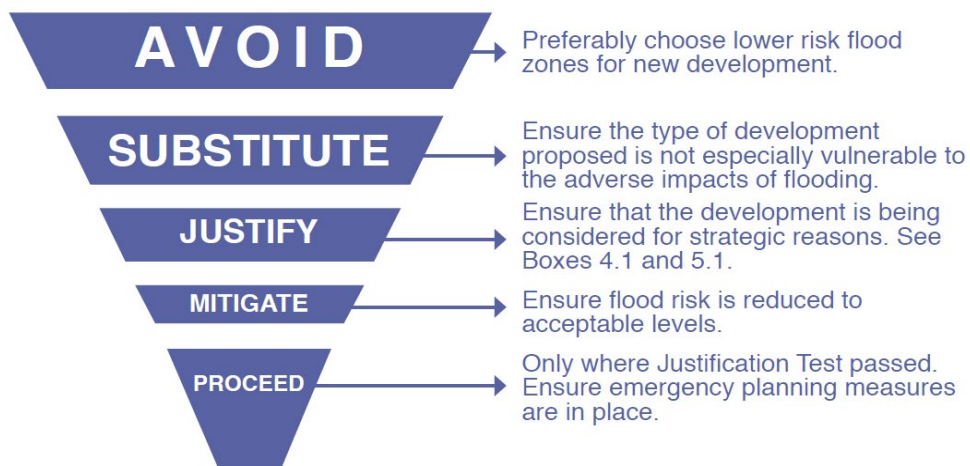


Figure 3-2: Sequential Approach Principles in Flood Risk Management Source: The Planning System and Flood Risk Management (Figure 3.1)

Where rezoning is not possible, exceptions to the development restrictions are provided for through the application of the Justification Test. Many towns have central areas that are affected by flood risk and have been targeted for growth. To allow the sustainable and compact development of these urban centres, development in areas of flood risk may be considered necessary. For development in such areas to be allowed, the Justification Test must be passed.

The Justification Test has been designed to rigorously assess the appropriateness, or otherwise, of such developments. The test is comprised of two processes: the Plan-making Justification Test, and the Development Management Justification Test. The latter is used at the planning application stage where it is intended to develop land that is at moderate or high risk of flooding for uses or development vulnerable to flooding that would generally be considered inappropriate for that land.

Table 3 3 shows which types of development, based on vulnerability to flood risk, are appropriate land uses for each of the Flood Zones. The aim of the SFRA is to guide development zonings to those which are 'appropriate' and thereby avoid the need to apply the Justification Test.

Table 3-3: Matrix of Vulnerability versus Flood Zone

	Flood Zone A High Probability	Flood Zone B Moderate Probability	Flood Zone C Low Probability
Highly Vulnerable Development (Including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less Vulnerable Development	Justification Test	Appropriate	Appropriate
Water-Compatible Development	Appropriate	Appropriate	Appropriate

3.8 Scales and Stages of Flood Risk Assessment

Within the hierarchy of regional, strategic and site-specific flood-risk assessments, a tiered approach ensures that the level of information is appropriate to the scale and nature of the flood-risk issues and the location and type of development proposed, avoiding expensive flood modelling and development of mitigation measures where it is not necessary. The stages and scales of flood risk assessment comprise of:

- **Regional Flood Risk Appraisal (RFRA)** – a broad overview of flood risk issues across a region to influence spatial allocations for growth in housing and employment and to identify where flood risk management measures may be required at a regional level to support the proposed growth. This should be based on readily derivable information and undertaken to inform the Regional Planning Guidelines.
- **Strategic Flood Risk Assessment (SFRA)** – an assessment of all types of flood risk informing land use planning decisions. This will enable the Planning Authority to allocate appropriate sites for development, whilst identifying opportunities for reducing flood risk. This SFRA will revisit and develop the flood risk identification undertaken in the RFRA and consider a range of potential sources of flooding. An initial flood risk assessment, based on the identification of Flood Zones, will also be carried out for those areas zoned for development. Where the initial flood risk assessment highlights the potential for a significant level of flood risk, or there is conflict with the proposed vulnerability of development, then a site-specific FRA will be recommended, which will necessitate a detailed flood risk assessment.
- **Site Specific Flood Risk Assessment (FRA)** – site or project specific flood risk assessment to consider all types of flood risk associated with the site and propose appropriate site management and mitigation measures to reduce flood risk to and from the site to an acceptable level. If the previous tiers of study have been undertaken to appropriate levels of detail, it is highly likely that the site-specific FRA will require detailed channel and site survey, and hydraulic modelling.

4 Data Collection

This section reviews the data collection and the flood history for the settlements so that any additional information on flooding can be included within this SFRA. It will confirm the extent of extreme flooding (through the Flood Zone mapping) and key sources of flood risk.

Table 4-1: Available Flood Risk Data

Description	Coverage	Robustness	Comments on usefulness
Western CFRAM Study	Areas for further assessment (AFAs), or settlements falling along modelled lengths, in County Mayo are: Ballyhaunis Ballina Castlebar Charlestown Crossmolina Foxford Louisburgh Newport Swinford Westport Westport Quay	Flood Zones and flood extents for current and future scenarios provided by OPW. Modelling is 'best available' and outputs will allow informed decisions on zoning objectives. Design water levels will inform decisions relating to raising land and setting finished floor levels.	Very useful but undertaken at a catchment level. In general, CFRAM provides all information needed to apply the Justification Test (JT) for Plan Making under the SFRA. Site specific FRAs will still be required for planning applications, but information on water levels can form the basis of decision in relation to finished floor levels. However, it is important to note that CFRAM outputs should not be relied upon without review and consideration of appropriateness to the site in question, particularly for Medium Priority Watercourses (MPW).
OPW Preliminary Flood Risk Assessment (PFRA) flood maps	The PFRA was a national screening exercise that was undertaken by OPW to identify areas at potential risk of flooding. Fluvial, coastal, pluvial and groundwater risks were identified at an indicative scale.	Moderate/Low	Covers nearly all rivers (including non-CFRAM). For purposes of SFRA and at Development Management level these cannot be used to make zoning decisions without validation through site visits. Further site investigation has been undertaken to provide greater confidence in the outlines and inform the land use zoning decisions, where applicable.
Historical event outlines and point observations and reports	Various, taken from www.floodmaps.ie	Indicative	Used indirectly to validate flood zones and identify non-fluvial flooding in the SFRA. Useful background information for site specific FRAs, but note the database is not exhaustive, absence of a record does not necessarily mean absence of flood risk.
Flood relief schemes	There are no completed OPW Flood Relief	n/a	n/a

	Schemes that are in place within County Mayo.		
Site Specific FRAs	Settlement or sub-settlement.	Moderate	Helpful for additional verification of PFRA and/or Benefitting Lands mapping.
Site Visits		Moderate	Site visits used to verify flood extents where there were potential conflicts with predicted flood extent and undeveloped land uses with highly or less vulnerable land use zoning objectives.

Table 4-2: Other Available Data

Description	Coverage	Robustness	Comment on usefulness
Alluvial Soil Maps	Full Study Area	Low	Used in the Regional FRA Report to provide initial assessment of risks. Not used in SFRA and little or no value to FRA.
Groundwater vulnerability maps	Broadscale, County wide	Moderate	Initial assessment of groundwater vulnerability. Provides a screening tool for use in FRA.
Historic Flood Records including photos, aerial photos and reports.	Broad, spot coverage	Various	Yes, indirectly to validate Flood Zones & identify other flood sources. Review of such sources will be required for all site specific FRAs.

4.1 Flood Zone Development

As set out in the RSES Regional Flood Risk Appraisal Report, and under the Planning Guidelines, the Flood Zone mapping for the County is principally derived from the CFRAM where possible. However, many settlements in the MCDP are not covered by the CFRAM and in this case a range of other datasets, as shown in Table 4-1, were used as supplementary information to inform this SFRA.

Due to recent guidance from OPW regarding the use of the first generation PFRA mapping and the indicative nature of the flood extents, the approach used under the Mayo SFRA has been precautionary. All sources of available flood mapping were reviewed in cases where proposed undeveloped lands are zoned for highly or less vulnerable use (where CFRAM was not available). A single dataset of County Flood Zones has been provided using the best available data for each area. Where PFRA is used in the land use decision making process this is backed up by expert on-site appraisal.

During the site visit the flood mapping was appraised on site by an experienced flood risk manager and professional opinion and judgement has been used to develop the recommendations within the Settlement Review of Section 8.

The review of the suite of flood risk data has been developed as a spatial planning tool to guide MCC in making land-use zoning and development management decisions. The data sets have been deemed appropriate for the planning decisions being made at this stage of the plan making process and where flood risk is identified the following approach has been undertaken;

- Application of the Justification Test and/or;
- Further detailed analysis, or;
- Rezoning to a less vulnerable use, or;
- Further assessment at Development Management stage in limited circumstances where it has been determined that development should be possible in principle, taking into account a site specific opinion.

When the National Indicative Flood Mapping (NIFM) is issued to Local Authorities the data will be used in conjunction with the other available datasets and site visits to provide a countywide Flood Zone dataset, subject to further verification.

In general, where CFRAM modelling has been carried out, flood levels are available at selected node points along the watercourse. Once an appropriate level of validation has been undertaken as part of the site-specific FRA, these flood levels may be used to form the basis of the development design.

5 Sources of Flooding

This SFRA has reviewed flood risk from fluvial, pluvial and groundwater sources. Flooding events have become more pronounced in Ireland, and County Mayo, in recent years. Climate change risks also need to be considered at a strategic and site-specific scale. Climate change is discussed in Section 7 in relation to incorporation of climate change into the flood risk assessment. A comment on the likely impacts of climate change, on a settlement basis, has been provided in Section 7.

5.1 Fluvial Flooding

Flooding from rivers and streams is associated with the exceedance of channel capacity during higher flows. The process of flooding from watercourses depends on numerous characteristics associated with the catchment including; geographical location and variation in rainfall, steepness of the channel and surrounding floodplain and infiltration and rate of runoff associated with urban and rural catchments. Generally, there are two main types of catchments; large and relatively flat or small and steep, both giving two very different responses during large rainfall events.

In a large, relatively flat catchment, flood levels will rise slowly, and natural floodplains may remain flooded for several days or even weeks, acting as the natural regulator of the flow. In small, steep catchments local intense rainfall can result in the rapid onset of deep and fast-flowing flooding with little warning. Such "flash" flooding, which may only last a few hours, can cause considerable damage and possible risk to life

5.1.1 Arterial Drainage

Another form of fluvial regime is related to rivers that have been subject to an OPW Arterial Drainage Scheme (ADS). The OPW carried out a number of Arterial Drainage Schemes on catchments under the Arterial Drainage Act, 1945. The main purpose of the ADSs was to improve land drainage and reduce the frequency and extent of overland flooding. ADSs can involve embankment construction, river straightening, lake storage development, and, most commonly, the deepening and widening of river channels. Through the implementation of ADSs the hydraulic conveyance efficiency of a catchment is increased, thereby leading to a reduction in overland flood storage. Although it has been found that ADS generally achieve their main objectives, this increase in discharge-carrying capacity leads to an acceleration of the response to rainfall with flood peaks of increased intensity and more rapid recessions.

The Moy and Corrib Arterial Drainage Schemes are located with County Mayo. The Moy ADS was completed in 1971, and the Corrib ADS was completed in 1964.

5.1.2 Drainage Districts

The drainage districts were established under the Arterial Drainage Act, 1945, and subsequent Amendment Act, 1995. The Act deals with the improvement of lands by drainage and preventing or substantially reducing the flooding of lands. The Act set up the process of Arterial Drainage Schemes and provides for the maintenance of these works. It also implements a number of drainage and flood reduction related measures such as approval procedures for bridges and weirs and iterates reporting requirements for Drainage Districts. There are 16 drainage districts in County Mayo.

5.1.3 Fluvial Summary

The form of the floodplain, either natural, semi-natural (drained) or urbanised, can influence flooding along watercourses. The location of buildings and roads can significantly influence flood depths and velocities by altering flow directions and reducing the volume of storage within the floodplain. Critical structures such as bridge and culverts can also significantly reduce capacity creating pinch points within the

floodplain. These structures are also vulnerable to blockage by natural debris within the channel or by fly tipping and waste.

Flood risk to specific settlements is discussed in Section 8 and has been used to inform the zoning objectives for the Development Plan.

5.2 Flooding from Defence Overtopping or Breach

There are a number of drainage district embankments noted along the Moyour Drainage District. In addition to these embankments there will also be a number of walls and other structures which, whilst not designed to act as flood defences, provide a level of protection against flood water.

Existing development clearly benefits from the construction of defences, and new defences will be considered as one means of facilitating the redevelopment of the settlements. However, it is against sustainability objectives, and the general approach of the OPW, to construct defences with the intention of releasing green field land for development. It is also not appropriate to consider the benefits of schemes which have not been constructed or which may only be at pre-feasibility or design stage.

Residual risk is the risk that remains after measures to control flood risk have been carried out. Residual risk can arise from overtopping of flood defences and / or from the breach from structural failure of the defences

The concept of residual risk is explained in 'The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009' as follows:

"Although flood defences may reduce the risk of flooding, they cannot eliminate it. A flood defence may be overtopped by a flood that is higher than that for which it was designed or be breached and allow flood water to rapidly inundate the area behind the defence. In addition, no guarantee can be given that flood defence will be maintained in perpetuity. As well as the actual risk, which may be reduced as a result of the flood defence, there will remain a residual risk that must be considered in determining the appropriateness of particular land uses and development. For these reasons, flooding will still remain a consideration behind flood defences and the flood zones deliberately ignore the presence of flood defences."

Overtopping of flood defences will occur during flood events greater than the design level of the defences. Overtopping is likely to cause lower levels of inundation of the floodplain than if defences had not been built, but the impact will depend on the duration, severity and volume of floodwater. However, and more critically, overtopping can destabilise a flood defence, cause erosion and make it more susceptible to breach or fail. Recovery time and drainage of overtopping quantities should also be considered. Overtopping may become more likely in future years due to the impacts of climate change and it is important that any assessment of defences includes an appraisal of climate change risks.

Breach or structural failure of flood defences is hard to predict and is largely related to the structural condition and type of flood defence. 'Hard' flood defences such as solid concrete walls are less likely to breach than 'soft' defence such as earth embankments. Breach will usually result in sudden flooding with little or no warning and presents a significant hazard and danger to life. There is likely to be deeper flooding in the event of a breach than due to overtopping.

Whilst it is important that residual risks are recognised and appropriate management measures put in place, it is also important to acknowledge the benefits that a flood relief scheme provides to those living and working behind it. In this regard, although 'The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009' requires flood zones to be undefended, consideration

should be given to the benefit provided by flood defences, but only once the Justification Test has been applied and passed.

5.3 Pluvial Flooding

Flooding of land from surface water runoff is usually caused by intense rainfall that may only last a few hours. The resulting water follows along natural valley lines, creating flow paths along roads and through and around developments and ponding in low spots, which often coincide with fluvial floodplains. Any areas at risk from fluvial flooding will almost certainly be at risk from surface water flooding.

The PFRA study considered pluvial flood risk and produced a national set of pluvial flood maps. This dataset was reviewed and used to identify development areas at particular risk of surface water and pluvial flooding. However, the level of detail contained in the PFRA map, and the widespread distribution of areas at risk did not allow a commentary relating to pluvial flood risk to be developed, or for particularly high-risk areas to be identified. Instead, an overall strategy for the management of pluvial risk is presented and should be implemented across all development proposals. This, and recommendations for the assessment of surface water risks, are provided in the Flood Risk Management Policy section.

5.4 Flooding from Drainage Systems

Flooding from artificial drainage systems occurs when flow entering a system, such as an urban storm water drainage system, exceeds its discharge capacity, it becomes blocked or it cannot discharge due to a high-water level in the receiving watercourse.

Flooding in urban areas can also be attributed to sewers. Sewers have a finite capacity which, during certain load conditions, will be exceeded. In addition, design standards vary and changes within the catchment areas draining to the system, in particular planned growth and urban creep, will reduce the level of service provided by the asset. Sewer flooding problems will often be associated with regularly occurring storm events during which sewers and associated infrastructure can become blocked or fail. This problem is exacerbated in areas with under-capacity systems. In the larger events that are less frequent but have a higher consequence, surface water will exceed the sewer system and flow across the surface of the land, often following the same flow paths and ponding in the same areas as overland flow.

Foul sewers and surface water drainage systems are spread extensively across the urban areas with various interconnected systems discharging to treatment works and into local watercourses.

5.5 Groundwater Flooding

Groundwater flooding is caused by the emergence of water originating from underground and is particularly common in karst landscapes. This can emerge from either point or diffuse locations. The occurrence of groundwater flooding is usually very local and unlike flooding from rivers and the sea, does not generally pose a significant risk to life due to the slow rate at which the water level rises. However, groundwater flooding can cause significant damage to property, especially in urban areas and pose further risks to the environment and ground stability. Groundwater flooding was identified as a key consideration in the west of Ireland due to the karstic landscape of the region.

In the absence of primary groundwater maps, the groundwater vulnerability maps are useful as a surrogate dataset. The vulnerability index, derived by the Geological Survey of Ireland (GSI), is based on a number of parameters including the;

- Sub-soils that overlie the groundwater;
- Type of recharge - whether point or diffuse; and

- Thickness of the unsaturated zone through which the contaminant moves.

The basis of the surrogacy is that the more vulnerable the groundwater is to contamination (i.e. passage of contaminants down through the soil), the more chance there is of the groundwater rising to the surface and causing flooding.

The GSI mapping indicates that much of the groundwater in Mayo is low to extremely highly vulnerable to contamination. The areas which are extremely vulnerable tend towards west and south west of the county.

5.6 Coastal Flooding

Coastal flooding occurs when sea levels along the coast or in estuaries exceed neighbouring land levels, or overcome coastal defences where these exist, or when waves overtop the coastline or coastal defences.

Coastal towns such as, Ballina, have been identified in the Regional Spatial and Economic Strategy as being at risk from storm surges and/or high tides emanating from the Atlantic Ocean.

6 Flood Risk Management and Policy

The implementation of the Planning Guidelines throughout the county is achieved through the application of the policies and objectives contained within the MCDP 2021-2027.

The use and application of the policies and guidelines constitutes the formal plan for flood risk management in County Mayo. This approach has been achieved in the development plan making process in the settlements contained within the plan and covered in this SFRA.

The specific management of risk is discussed for each settlement in Section 8.

6.1 Flood Risk and Surface Water Policy MCDP 2020-2027

The stormwater policies and objectives contained within Section 7 of the MCDP 2021-2027 are as follows:

Surface Water Policy	
INP 9	To liaise and work in conjunction with Irish Water in the implementation of the Memorandum of Understanding (MOU) for surface water drainage and flood management, including the separation of foul and surface water drainage networks where feasible and undertake drainage network upgrades to help remove surface water misconnection and infiltration.
INP 10	To support, in conjunction with Irish Water, the improvement of storm water infrastructure to improve sustainable drainage and reduce the risk of flooding in urban environments.

Surface Water Objectives	
INO 14	To support, promote and facilitate the use of green infrastructure, for example green roofs, green walls, planting and green spaces for surface water run-off retention purposes, in the interests of flood mitigation and climate change adaptation.
INO 15	To require the use of SuDS to minimise and limit the extent of hard surfacing and paving and require the use of sustainable drainage techniques where appropriate for new development or for extensions to existing developments, in order to reduce the potential impact of existing and predicted flooding risks.
INO 16	To ensure new development is adequately serviced with surface water drainage infrastructure, which meets the requirements of the Water Framework Directive, associated River Basin Management Plans and Catchment Flood Risk Assessment Management (CFRAM) Plans.

The management of surface and storm water is important so as to avoid increased flood or pollution risk in the storm water network, rivers and streams in the county's towns, villages and rural areas. The Council will require compliance with best practice guidance for the collection, reuse, treatment and disposal of surface waters for all future development proposals.

Traditionally, rain falling on impervious surfaces was directed into a receiving watercourse through surface water drainage systems. While such drainage systems are effective at transferring surface water quickly, they provide only limited attenuation

causing the volume of water in the receiving watercourse to increase more rapidly, thereby increasing flood risk.

Sustainable Drainage Systems, commonly known as SuDS is an approach that seeks to manage the water as close as possible to its origin by various engineering solutions that replicate natural drainage processes, before it enters the watercourse. The incorporation of SuDS techniques allows surface water to be either infiltrated or conveyed more slowly to water courses using porous surface treatments, ponds, swales, filter drains or other installations.

SuDS provide an integrated approach which addresses water quantity, water quality, amenity and habitat. The Council will require the application of SuDS in development proposals, for example through reducing the extent of hard surfacing, and using permeable pavements.

For proposed development outside a settlement boundary (not subject to zoning) the Policies and Objectives of the MCDP still apply.

The flood risk policies and objectives contained within Section 7 of the MCDP 2021-2027 are as follows:

Flood Risk Management Policy	
INP 11	To have regard to the Guidelines for Planning Authorities on the Planning System and Flood Risk Management (DoEHLG/OPW 2009) and Circular PL2/2014 (or as updated), in the preparation of plans and strategies related to development and in the assessment of projects.
INP 12	To support the implementation of the recommendations in the Flood Risk Management Plans (FRMP's), including planned investment measures for managing and reducing flood risk.
INP 13	To support the implementation of recommendations in the CFRAM Programme to ensure that flood risk management policies and infrastructure are progressively implemented.

Flood Risk Management Objectives	
INO 17	To ensure that a flood risk assessment is carried out for any development proposal where a flood risk is identified in accordance with the Planning System and Flood Risk Management (DoEHLG/OPW 2009) and Circular PL2/2014. This assessment shall be appropriate to the scale and nature of risk to the potential development.
INO 18	To consult with the OPW in relation to proposed developments in the vicinity of drainage channels and rivers for which the OPW are responsible and retain a strip on either side of such channels where required, to facilitate maintenance access thereto.
INO 19	To assist the OPW in developing catchment-based Flood Risk Management Plans for rivers in County Mayo and have regard to their provisions/recommendations.
INO 20	To protect the integrity of any formal (OPW or Mayo County Council) flood risk management infrastructure, thereby ensuring that any new development does not negatively impact any existing defence infrastructure or compromise any proposed new infrastructure.

INO 21	To ensure that where flood risk management works take place that natural heritage, cultural heritage, rivers, streams and watercourses are appropriately protected.
INO 22	To consult, where necessary, with Inland Fisheries Ireland, the National Parks and Wildlife Service and other relevant agencies in the provision of flood alleviation measures in the county.
INO 23	To ensure each flood risk management activity is examined to determine actions required to embed and provide for effective climate change adaptation as set out in the OPW Climate Change Sectoral Adaptation Plan Flood Risk Management applicable at the time.
INO 24	To cooperate with the Office of Public works in the delivery of the Crossmolina Flood Relief scheme and other schemes that may be brought forward in the lifetime of this Plan.
INO 25	To identify and preserve vulnerable floodplains, wetlands and coastal areas to the maximum possible extent in both urban and rural areas.

6.2 CFRAM Recommendations

Following the publication of the final Flood Risk Management Plans for the CFRAM Study in May 2018 a 10 year €1billion programme of works (for 118 schemes) was announced by the OPW.

Viable schemes in Mayo were identified as Ballina, Castlebar and Newport. Charlestown and Foxford were investigated as a Areas for Further Assessment (AFAs) however significant risk was not identified. Louisburgh, Swinford and Westport were also identified as AFAs, however but no economically viable schemes were identified. It was therefore recommended by the CFRAM that the proposed measure for Louisburgh, Swinford and Westport be progressed to include a detailed assessment of the costs to determine if an economically viable measure may exist that could justify the progression to full project-level assessment.

6.2.1 River Deel Flood Relief Scheme - Crossmolina

The River Deel (Crossmolina) Flood Relief Scheme was initiated in 2012 following on from a "Feasibility Report on the Crossmolina Flooding Problem" carried out by OPW in January 2012 and with significant historic flooding in the area. The proposed flood scheme for the River Deel is a diversion channel upstream of the town with a capacity of 110 cumec, which will redirect flood waters away from the town, directly to the flood plains of Lough Conn. The scheme will be designed to cater for the 1% Annual Exceedance Probability (AEP) flood event (also known as the 100-year flood event), but will also cater for a larger flood event as the diversion channel has additional capacity. This will safeguard against flooding associated with potential future climate change that could increase the size of the 100-year flood event. Construction of the scheme is scheduled to take place in late 2020.

7 Development Management and Flood Risk

In order to guide both applicants and relevant council staff through the process of planning for and mitigating flood risk, the key features of a range of development scenarios have been identified (relating the flood zone, development vulnerability and presence or absence of defences). For each scenario, a number of considerations relating to the suitability of the development are summarised below.

It should be noted that this section of the SFRA begins from the point that all land zoned for development has passed the Justification Test for Development Plans, and therefore passes Part 1 of the Justification Test for Development Management – which states that the land has in the first instance been zoned accordingly in a development plan (that underwent an SFRA). In addition to the general recommendations in the following sections, Section 8 should be reviewed for specific recommendations for individual settlements, including details of the application of the Justification Test. In areas where there are no formal land use zoning objectives, the Justification Test cannot pass for any sites within Flood Zone A/B. It would be down to a site-specific FRA to confirm (in appropriate detail) the extent of Flood Zone A/B.

In order to determine the appropriate design standards for a development it may be necessary to undertake a site-specific flood risk assessment. This may be a qualitative appraisal of risks, including drainage design. Alternatively, the findings of the CFRAM, or other detailed study, may be drawn upon to inform finished floor levels. In other circumstances a detailed modelling study and flood risk assessment may need to be undertaken. Further details of each of these scenarios, including considerations for the flood risk assessment are provided in the following sections.

7.1 Requirements for a Flood Risk Assessment

Assessment of flood risk is required in support of any planning application where flood risk may be an issue, and this may include sites in Flood Zone C (low probability of flooding) where a watercourse or field drain exists nearby. The level of detail will vary depending on the risks identified and the proposed land use. As a minimum, all proposed development, including that in Flood Zone C, must consider the impact of surface water flood risks on drainage design. In addition, flood risk from sources other than fluvial should be reviewed.

For sites within Flood Zone A or B (high/moderate probability of flooding), a site specific "Stage 2 - Initial FRA" will be required and may need to be developed into a "Stage 3 - Detailed FRA". The extents of Flood Zone A and B are delineated through this SFRA. However, future studies may refine the extents (either to reduce or enlarge them) so a comprehensive review of available data should be undertaken once an FRA has been triggered.

Within the FRA the impacts of climate change and residual risk (including culvert/structure blockage) should be considered and remodelled where necessary, using an appropriate level of detail, in the design of finished floor levels. Further information on the required content of the FRA is provided in the Planning System and Flood Risk Management Guidelines.

Any proposal that is considered acceptable in principle shall demonstrate the use of the sequential approach in terms of the site layout and design and, in satisfying the Justification Test (where required), the proposal will demonstrate that appropriate mitigation and management measures are put in place.

7.2 Drainage Design

All proposed development, whether in Flood Zone A, B or C, must consider the impact of surface water flood risks on drainage design as specified by the surface water management policies in the Greater Dublin Strategic Drainage Study (GSDSDS) and this

will be considered in the planning process. This may be in the form of a section within the flood risk assessment (for sites in Flood Zone A or B) or part of a surface water management plan.

Areas vulnerable to ponding are indicated on the OPW's PFRA mapping. Particular attention should be given to development in low-lying areas which may act as natural ponds for collection of run-off.

The drainage design should ensure no increase in flood risk to the site, or the downstream catchment. Where possible, and particularly in areas of new development, floor levels should at a minimum be 300mm above adjacent roads and hard standing areas to reduce the consequences of any localised flooding. Where this is not possible, an alternative design appropriate to the location may be prepared.

In addition, for larger sites (i.e. multiple dwellings or commercial units) master planning should ensure that existing flow routes are maintained, through the use of green infrastructure.

7.3 Development Proposals in Flood Zone C

Where a site is within Flood Zone C, but adjoining or in close proximity to Flood Zone A or B there could be a risk of flooding associated with factors such as future scenarios (climate change) or in the event of failure of a defence, blocking of a bridge or culvert. Risk from sources other than fluvial must also be addressed for all development in Flood Zone C. As a minimum in such a scenario, a flood risk assessment should be undertaken which will screen out possible indirect sources of flood risk and where they cannot be screened out, it should present mitigation measures. The most likely mitigation measure will involve setting finished floor levels to a height that is above the 1 in 100-year fluvial flood level, with an allowance for climate change and freeboard, or to ensure a step up from road level to prevent surface water ingress. Design elements such as channel maintenance or trash screens may also be required. Evacuation routes in the event of inundation of surrounding land should also be detailed.

The impacts of climate change should be considered for all proposed developments. A development which is currently in Flood Zone C may be shown to be at risk when 0.5m is added to the extreme (1 in 200 year) tide. Details of the approach to incorporating climate change impacts into the assessment and design are provided in Section 7.6.

7.4 Application for Developments in Flood Zone A and B

7.4.1 Minor Developments

Section 5.28 of the Planning Guidelines on Flood Risk Management identifies certain types of development as being 'minor works' and therefore exempt from the Justification Test. Such development relates to works associated with existing developments, such as extensions, renovations and rebuilding of the existing development, small scale infill and changes of use.

Despite the 'Sequential Approach' and 'Justification Test' not applying, as they relate to existing buildings, an assessment of the risks of flooding should accompany such applications. This must demonstrate that the development would not increase flood risks, by introducing significant numbers of additional people into the flood plain and/or putting additional pressure on emergency services or existing flood management infrastructure. The development must not have adverse impacts or impede access to a watercourse, floodplain or flood protection and management facilities. Where possible, the design of built elements in these applications should demonstrate principles of flood resilient design (See 'The Planning System and Flood Risk Management Guidelines for Planning Authorities Technical Appendices, 2009', Section 4 - Designing for Residual Flood Risk).

Generally, the approach to deal with flood protection would involve raising the ground floor levels above the level of extreme river levels. If this leads to floor levels being much higher than adjacent streets it could create a hostile streetscape for pedestrians. This would cause problems for infill development sites if floor levels were required to be significantly higher than those of neighbouring properties. In this regard, it has been recognised that some flexibility could be allowed, in limited circumstances, on a site by site basis, for commercial and business developments. In these cases, the detailed design of the development should reflect the vulnerability of the site in terms of materials, fixtures and fittings and internal layout. For high risk areas, less vulnerable uses are encouraged at ground floor levels. A site-specific FRA will inform appropriate uses and detailed design and layout.

It should be noted that for residential buildings within Flood Zone A or B, bedroom accommodation is more appropriate at upper floor levels.

For commercial operations, business continuity must be considered, and steps taken to ensure operability during and recovery after a flood event for both residential and commercial developments. Emergency access must be considered as in many cases flood resilience will not be easily achieved in the existing built environment.

The requirement for providing compensatory storage for minor developments has been reviewed and can generally be relaxed, even where finished floor levels have been raised. This is because the development concerns land which has previously been developed and would already have limited capacity to mitigate flooding. However, a commentary to this effect must be substantiated in the site-specific FRA.

7.4.2 Highly Vulnerable Development in Flood Zone A or B

Development which is highly vulnerable to flooding, as defined in The Planning System and Flood Risk Management, includes (but is not limited to) dwelling houses, schools, hospitals, emergency services and caravan parks.

New Development

It is not appropriate for new, highly vulnerable development to be located on greenfield land in Flood Zones A or B, particularly outside the core of a settlement and where there are no flood defences. Such proposals do not pass the Justification Test. Instead, a less vulnerable use should be considered.

For extant permissions in Flood Zone A/B if the site remains unconstructed and the planning application lapses, any future planning applications on the site should be subject to an appropriately detailed FRA specific to the new site layout and it may be found that the site cannot be developed as planned. As part of any future variation to the Development Plan or the preparation of a Local Area Plan (as applicable to the relevant settlement) lands with no extant permission should be considered in line with the sequential approach and Justification Test for Plan Making.

Existing Developed Areas

The Planning Circular (PL02/2014) states that *"notwithstanding the need for future development to avoid areas at risk of flooding, it is recognised that the existing urban structure of the country contains many well established cities and urban centres which will continue to be at risk of flooding. In addition, development plans have identified various strategically important urban centres whose continued consolidation, growth, development or generation, including for residential use, is being encouraged to bring about compact and sustainable growth."*

Minor/small scale infill housing, extensions or changes of use is discussed previously and, subject to site specific flood risk assessment, can generally be considered appropriate.

In cases where development has been justified, the outline requirements for a flood risk assessment and flood management measures have been detailed in this SFRA in the following sections and also the settlement review in Section 8. Of prime importance is the requirement to manage risk to the development site and not to increase flood risk elsewhere. This should give due consideration to safe evacuation routes and access for emergency services during a flood event.

7.4.3 Less Vulnerable Development in Flood Zone A or B

Less vulnerable development includes retail, leisure, warehousing, technology, enterprise and buildings used for agriculture and forestry a comprehensive categorisation of land uses and vulnerability is provided in Chapter 3 of the Planning System and Flood Risk Management Guidelines.

The design and assessment of less vulnerable development should generally begin with 1% AEP fluvial event as standard, with climate change and a suitable freeboard included in the setting of finished floor levels. The site-specific FRA should ensure that the risks are defined, understood, and accepted. Operability and emergency response should also be clearly defined. In a limited number of cases this may allow construction as low as the 1% AEP level to be adopted, provided the risks of climate change are included in the development through adaptable designs or resilience measures.

7.5 Key points for FRA for all types of developments

- Finished floor levels to be set above the 1% AEP fluvial (0.5% AEP tide) level, with an allowance for climate change plus a freeboard of at least 300mm. The freeboard allowance should be assessed, and the choice justified.
- Flow paths through the site and areas of surface water storage should be managed to maintain their function and without causing increased flood risk elsewhere.
- Compensatory storage is to be provided to balance floodplain loss as a result of raising ground levels within Flood Zone A. The storage should be provided within the flood cell and on a level for level basis up to the 1% level.
- In a defended site, compensatory storage is not required, but the impact of removing the net reduction in floodplain storage should be assessed, and any impacts to existing development mitigated for the 0.1% event or a breach of these defences.
- A site is considered to be defended if the standard of protection is 1% AEP, within which a freeboard of at least 300mm is included. The FFL of the proposed development needs to take into account the impacts of climate change and other residual risks, including the 0.1% event, unless this has also been incorporated into the defence design. This may be assessed through breach analysis, overtopping analysis or projection of levels from the channel inland.
- For less vulnerable development, it may be that a finished floor level as low as the 1% AEP level could be adopted, provided the risks of climate change are included in the development through adaptable designs or resilience measures. This approach should reflect emergency planning and business continuity to be provided within the development. It may reflect the design life of the development, the proposed use, the vulnerability of items to be kept in the premises, the occupants and users, emergency plan and inclusion of flood resilience and recovery measures.

7.6 Incorporating Climate Change into Development Design

In all developments, climate change should be considered when assessing flood risk and in particular residual flood risk. Climate change may result in increased flood

extents and therefore caution should be taken when zoning lands in transitional areas (i.e. on the edge of the floodplain). Consideration of climate change is particularly important where flood alleviation measures are proposed, as the design standard of the proposal may reduce significantly in future years due to increased rainfall, river flows and sea levels

The 'Planning System and Flood Risk Management' recommends that a precautionary approach to climate change is adopted due to the level of uncertainty involved in the potential effects. A significant amount of research into climate change has been undertaken on both a national and international front, and updates are ongoing.

Advice on the expected impacts of climate change and the allowances to be provided for future flood risk management in Ireland is given in the OPW draft guidance. Two climate change scenarios are considered; these are the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS). The MRFS is intended to represent a "likely" future scenario based on the wide range of future predictions available. The HEFS represents a more "extreme" future scenario at the upper boundaries of future projections. Based on these two scenarios the OPW recommended allowances for climate change are given in the table below. These climate change allowances are particularly important at the development management stage of planning and will ensure that proposed development is designed and constructed to take into account best current knowledge.

Table 7-1: Allowances for Future Scenarios (100-year Time Horizon)

Criteria		MRFS	HEFS
Extreme Rainfall	Depths	+20%	+30%
Flood Flows		+20%	+30%
Mean Sea Level Rise		+500mm	+1000mm
Land Movement		-0.5mm / year*	-0.5mm / year*
Urbanisation		No General Allowance - Review on Case by Case Basis	No General Allowance - Review on Case by Case Basis
Forestation		-1/6 Tp**	-1/3 Tp**+10% SPR***

Notes:

* Applicable to the southern part of the country only (Dublin - Galway and south of this)

** Reduce the time to peak (Tp) by a third; this allows for potential accelerated runoff that may arise as a result of drainage of afforested land

*** Add 10% to the Standard Percentage Runoff (SPR) rate; this allows for increased runoff rates that may arise following felling of forestry

Through the CFRAM Studies, both MRFS and HEFS model runs have been completed on all study watercourses, providing flood extent and depth maps. This information can be used to support flood risk assessments where the current CFRAM scenario has been deemed appropriate to the location.

For watercourses that are not part of the CFRAM programme, fluvial flood extents can be qualitatively assessed by using the Flood Zone B outline as a surrogate for 'Flood Zone A with allowance for the possible impacts of climate change', as suggested in the 'Planning System and Flood Risk Management'. Quantitative assessment of risks may require an additional model run to fully understand risks.

For most development, including residential, nursing homes, shops and offices, the medium-range future scenario (20% increase in flows) is an appropriate consideration. This should be applied in all areas that are at risk of flooding (i.e. within Flood Zone A and B) and should be considered for sites which are in Flood Zone C but are adjacent to Flood Zone A or B. This is because land which is currently not at risk may become vulnerable to flooding when climate change is taken into account.

Where the risk associated with inundation of a development is low and the design life of the development is short (typically less than 30 years) the allowance provided for climate change may be less than the 20% / 0.5m level. However, the reasoning and impacts of such an approach should be provided in the site-specific FRA.

Conversely, there may be development which requires a higher-level response to climate change. This could include major facilities which are extremely difficult to relocate, such as hospitals, airports, Seveso sites or power stations, and those which represent a high-economic and long-term investment within the scale of development across the county. In such situations it would be reasonable to expect the high-end future scenario (30% increase in flow) to be investigated in the site-specific FRA and used as the design standard.

In general, climate change will be accounted for the setting of finished floor levels to a height which includes an allowance for climate change. However, climate change may also reveal additional flow paths which need to be protected or give rise to flows which exceed culvert capacity or overtop defences. These outcomes will need to be specifically investigated for each site, and an appropriate response provided.

Further consideration to the potential future impacts of climate change is given for each settlement in Section 8.

7.7 Flood Mitigation Measures at Site Design

For any development proposal in an area at moderate or high risk of flooding that is considered acceptable in principle (i.e. has passed the Plan Making Justification Test), the site specific FRA must demonstrate that appropriate mitigation measures can be put in place and that residual risks can be managed to acceptable levels. This may include the use of flood-resistant construction measures that are aimed at preventing water from entering a building and that mitigate the damage floodwater causes to buildings. Alternatively, designs for flood resilient construction may be adopted where it can be demonstrated that entry of floodwater into buildings is preferable to limit damage caused by floodwater and allow relatively quick recovery.

Various mitigation measures are outlined below and further detail on flood resilience and flood resistance are included in the Technical Appendices of the Planning Guidelines, The Planning System and Flood Risk Management.

7.7.1 Site Layout and Design

To address flood risk in the design of new development, a risk-based approach should be adopted to locate more vulnerable land use to higher ground while water compatible development i.e. car parking (with appropriate flood management plan) and recreational space can be located in higher flood risk areas.

The site layout should identify and protect land required for current and future flood risk management. Waterside areas or areas along known flow routes can be used for recreation, amenity and environmental purposes to allow preservation of flow routes and flood storage, while at the same time providing valuable social and environmental benefits.

7.7.2 Ground Levels, Floor Levels and Building Use

Modifying ground levels to raise land above the design flood level is a very effective way of reducing flood risk to the site. However, in most areas of fluvial flood risk, conveyance or flood storage would be reduced locally and could increase flood risk off site. There are a number of criteria which must all be met before this is considered a valid approach:

- Development at the site must have been justified through this SFRA based on the existing (unmodified) ground levels.
- The FRA should establish the function provided by the floodplain. Where conveyance is a prime function then a hydraulic model will be required to show the impact of its alteration.
- The land being given over to storage must be land which does not flood in the 1% AEP fluvial event (i.e. Flood Zone B or C).
- Compensatory storage should be provided on a level for level basis to balance the total area that will be lost through infilling where the floodplain provides static storage.
- The provision of the compensatory storage should be in close proximity to the area that storage is being lost from (i.e. within the same flood cell).
- The land proposed to provide the compensatory storage area must be within the ownership / control of the developer.
- The compensatory storage area should be constructed before land is raised to facilitate development.
- Compensatory storage is generally not required for loss of floodplain in locations behind defences.

In some sites it is possible that ground levels can be re-landscaped to provide a sufficiently large development footprint. However, it is likely that in other potential development locations there is insufficient land available to fully compensate for the loss of floodplain. In such cases it will be necessary to reconsider the layout or reduce the scale of development or propose an alternative and less vulnerable type of development. In other cases, it is possible that the lack of availability of suitable areas of compensatory storage mean the target site cannot be developed and should remain open space.

Raising finished floor levels within a development is an effective way of avoiding damage to the interior of buildings (i.e. furniture and fittings) in times of flood. Alternatively, assigning a water compatible use (i.e. garage / car parking) or less vulnerable use to the ground floor level, along with suitable flood resilient construction, is an effective way of raising vulnerable living space above design flood levels. It can however have an impact on the streetscape. Safe access and egress is a critical consideration in allocating ground floor uses.

Depending on the scale of residual risk, resilient and resistance measures may be an appropriate response, but this will mostly apply to less vulnerable development.

7.7.3 Raised Defences

Construction of raised defences (i.e. flood walls and embankments) has traditionally been the response to flood risk. However, this is not a preferred option on an ad-hoc basis where the defences to protect the development are not part of a strategically led flood relief scheme. Where a defence scheme is proposed as the means of providing flood defence, the impact of the scheme on flood risk up and downstream must be assessed and appropriate compensatory storage must be provided.

7.8 Green Corridor

It is recommended that, where possible, and particularly where there is greenfield land adjacent to the river, a 'green corridor', is retained on all rivers and streams. This will have a number of benefits, including:

- Retention of all, or some, of the natural floodplain;
- Potential opportunities for amenity, including riverside walks and public open spaces;
- Maintenance of the connectivity between the river and its floodplain, encouraging the development of a full range of habitats;
- Natural attenuation of flows will help ensure no increase in flood risk downstream;
- Allows access to the river for maintenance works;
- Retention of clearly demarcated areas where development is not appropriate on flood risk grounds, and in accordance with the Planning System and Flood Risk Management.

The width of this corridor should be determined by the available land, and topographically constraints, such as raised land and flood defences, but would ideally span the fully width of the floodplain (i.e. all of Flood Zone A).

8 Settlement Zoning Review

The purpose of land use zoning objectives is to indicate to property owners and members of the public the types of development the Planning Authority considers most appropriate in each land use category. Zoning is designed to reduce conflicting uses within areas, to protect resources and, in association with phasing, to ensure that land suitable for development is used to the best advantage of the community as a whole.

This section of the SFRA will:

- Outline the strategic approach to flood risk management.
- Consider the land use zoning objectives utilised within the WMCDP settlements and assess their potential vulnerability to flooding.
- Based on the associated vulnerability of the particular use, a clarification on the requirement of the application of the Justification Test is provided.
- The consideration of the specific land use zoning objectives and flood risk will be presented for the settlements. Comment will be provided on the use of the sequential approach and justification test. Conclusions will be drawn on how flood risk is proposed to be managed in the settlement.

8.1 A Strategic Approach to Flood Risk Management

A strategic approach to the management of flood risk is important in County Mayo as the risks are varied and disparate, with scales of risk and scales of existing and proposed development varying greatly across the county.

Following the Planning Guidelines, development should always be located in areas of lowest flood risk first, and only when it has been established that there are no suitable alternative options should development (of the lowest vulnerability) proceed. Consideration may then be given to factors which moderate risks, such as defences, and finally consideration of suitable flood risk mitigation and site management measures is necessary.

It is important to note that whilst it may be technically feasible to mitigate or manage flood risk at site level, strategically it may not be a sustainable approach.

A summary of flood risks associated with each of the zoning objectives has been provided in the following settlement reviews. Table 8-1 indicates whether a certain land zoning, in Flood Zone A or B, will need to have the Plan Making Justification Test (JT) applied and passed.

When carrying out a site specific FRA, or when planning applications are being considered, it is important to remember that not all uses will be appropriate on flood risk grounds, hence the need to work through the Justification Test for Development Management on a site by site basis and with reference to Table 8-1. For example, a Mixed-Use Town Centre zoning objective is "to include for an integrated mix of residential, commercial, community and social uses" which have varying vulnerabilities and would not be equally permissible within Flood Zone A and B.

Table 8-1: Zoning Objective Vulnerability (Tier 2 settlements)

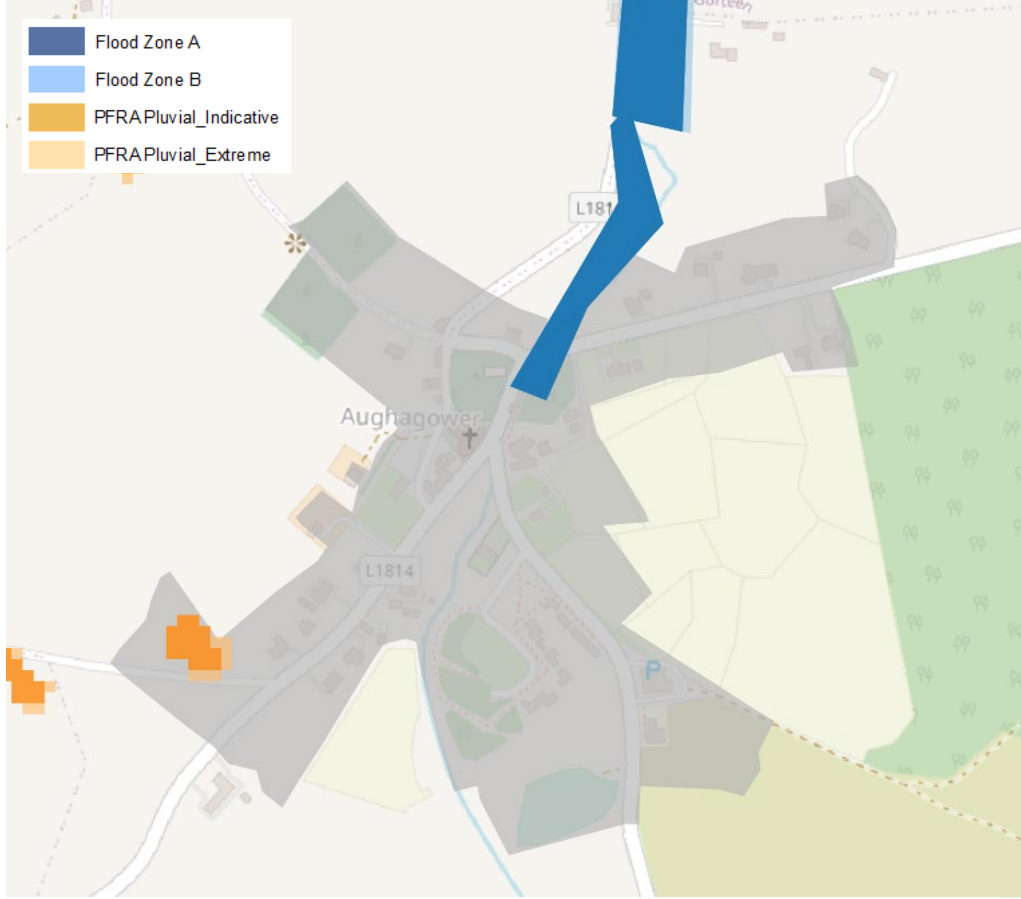
Zoning Objective	Map Legend	Indicative Primary Vulnerability	Flood Risk Commentary
Agriculture		Water compatible	Appropriate use in Flood Zone B, but JT will be needed in Flood Zone A.
Community Services and Facilities		Less / highly vulnerable	Consideration to be given to flood risks and sequential use of land to ensure highly vulnerable uses are located within areas at lowest risk of flooding.
Enterprise & Employment		Less vulnerable	Appropriate use in Flood Zone B, but JT will be needed in Flood Zone A.
Industry		Less vulnerable	Appropriate use in Flood Zone B, but JT will be needed in Flood Zone A.
Residential Medium Density		Highly Vulnerable	JT required for within Flood Zone A and B.
Residential Low Density		Highly Vulnerable	JT required for within Flood Zone A and B.
Residential Strategic Reserve		Highly Vulnerable	Cannot be developed within the lifetime of the plan – JT required for within Flood Zone A and B.
Rural Transition		Highly Vulnerable / Water Compatible	Appropriate use in Flood Zone B, but JT will be needed for less vulnerable development in Flood Zone A For water compatible JT not needed. Land use appropriate and should be retained.
Recreation and Amenity		Less Vulnerable / Water Compatible	Appropriate use in Flood Zone B, but JT will be needed for less vulnerable development in Flood Zone A For water compatible JT not needed. Land use appropriate and should be retained.
Infrastructure and Utilities		Less / Highly Vulnerable	For highly vulnerable development in Flood Zone A or B. For less vulnerable development in Flood Zone A.
Town Centre		Less / Highly Vulnerable	For highly vulnerable development in Flood Zone A or B. For less vulnerable development in Flood Zone A.

The following sections review the land use zoning objectives for each settlement within the plan and provide a comprehensive summary of flood risk and justification where necessary.

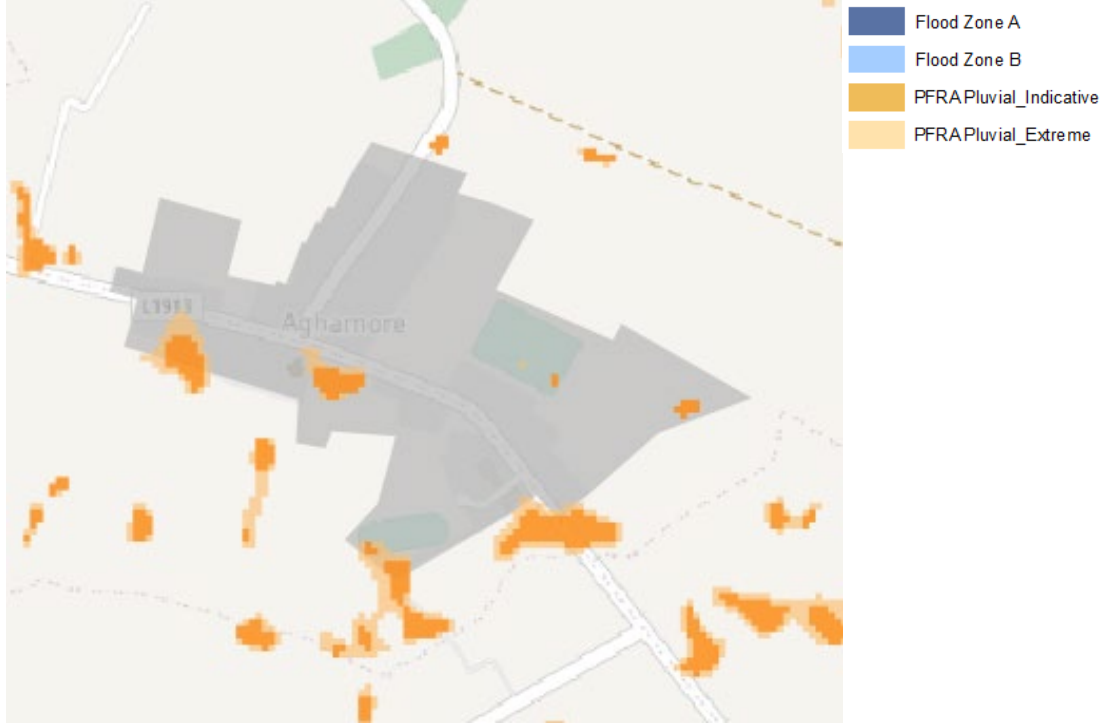
8.2 Achill Sound

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA & ICPSS
Historic Flooding	No historic records of flooding were found
Comment	Flood risk to Achill Sound is present from both tidal and fluvial sources. The Sraheens River flows in an easterly direction in the south of the settlement. The PFRA flood mapping suggests a risk to existing residential properties and undeveloped lands. The ICPSS flood mapping also suggests that existing developments and undeveloped lands along the coastline are at risk of flooding. There is limited predicted pluvial flood risk.
Climate Change	The low-lying area of the settlement which is influenced by tidal flooding would be highly sensitive to the impacts of climate change
Conclusion	Any new development should follow the sequential approach and Flood Zone A/B should be avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

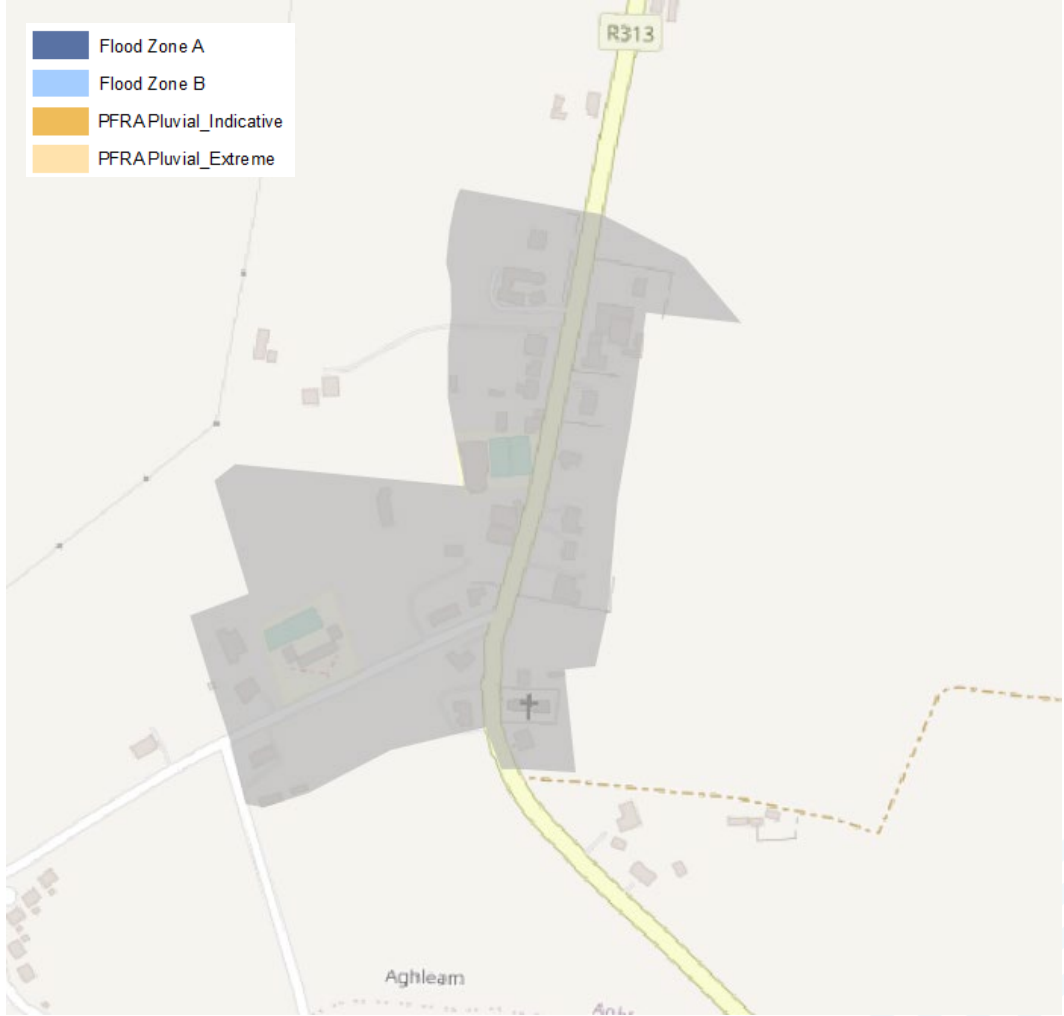
8.3 Aghagower

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	The Deerpark River flows through the village centre. PFRA Flood extents indicate flood risk to undeveloped lands and the L1816 road. There are two small streams, the Aghagower Stream and the Gorteen Stream which join the Deerpark River just north of the village centre. Pluvial flood risk is limited.
Climate Change	Low sensitivity to an increase in fluvial flow, Possible increase in runoff.
Conclusion	Risk should be assessed for any proposed development adjacent to the river, streams and PFRA flood extents. In general, the sequential approach should be followed and Flood Zone A/B should be avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.4 Aghamore

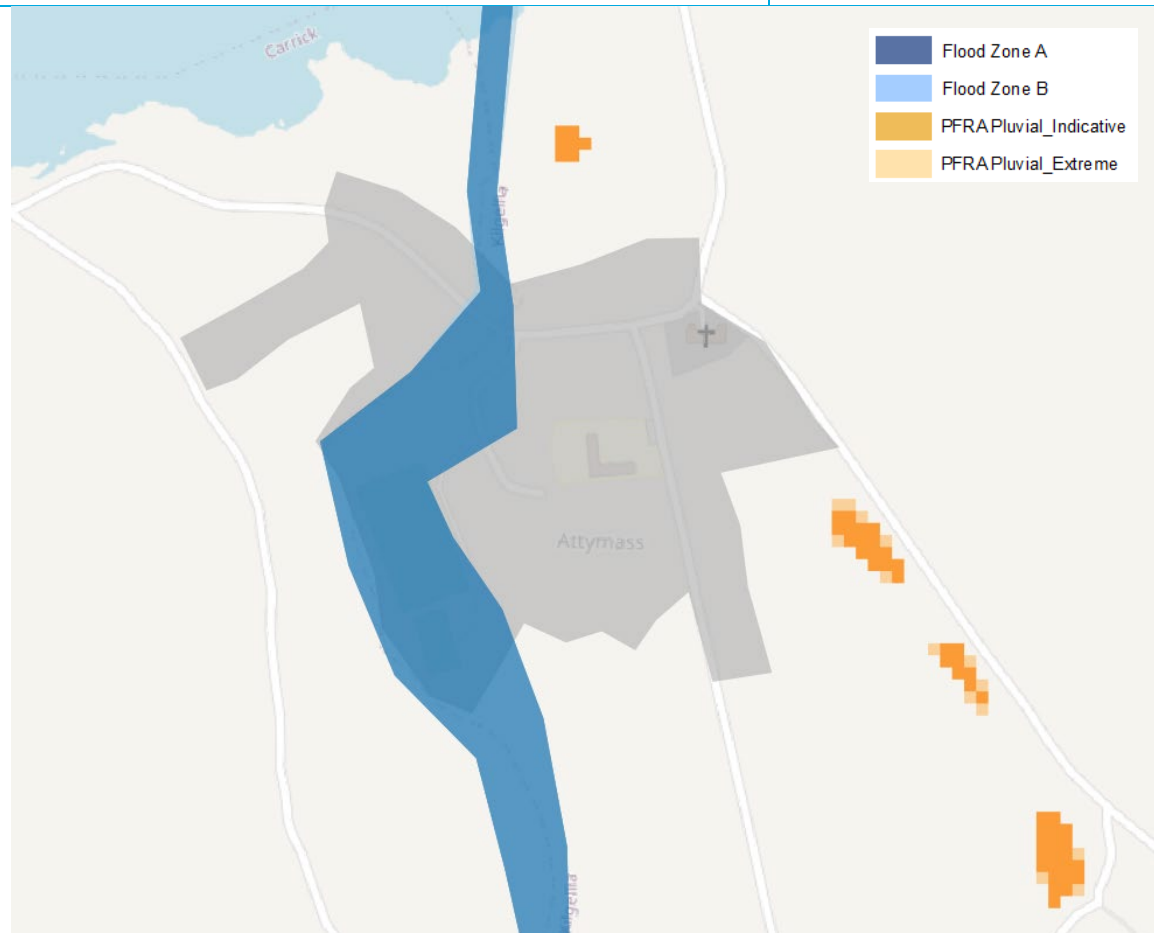
Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA pluvial
Historic Flooding	No historic records of flooding were found
Comment	Risk is limited to limited areas of predicted pluvial ponding.
Climate Change	Low sensitivity to an increase in fluvial flow, Possible increase in runoff.
Conclusion	Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.5 Aghleam

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	Blue Line
Historic Flooding	No historic records of flooding were found
Comment	A small stream flows through undeveloped lands in an easterly direction south of Aghleam village outfalling into Blacksod Bay. The stream is therefore influenced by both fluvial and tidal sources but is outside of the settlement boundary. There is no mapped pluvial flooding.
Climate Change	As the stream is influenced by tidal flooding, it would be highly sensitive to impacts of climate change.
Conclusion	Risk is low within the settlement boundary, but in general should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.6 Attymass

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No



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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	The Kildermort River flows in a northerly direction through the village. The PFRA Flood extents indicate a significant area of developed and undeveloped lands are at risk of fluvial flooding. Pluvial flooding is predicted to be minimal.
Climate Change	Low sensitivity to change in flows.
Conclusion	In general, the sequential approach should be followed, and Flood Zone A/B should be avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. A Stage 3 FRA would be required for any proposed development within or adjacent to the Flood Zones. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.7 Balla

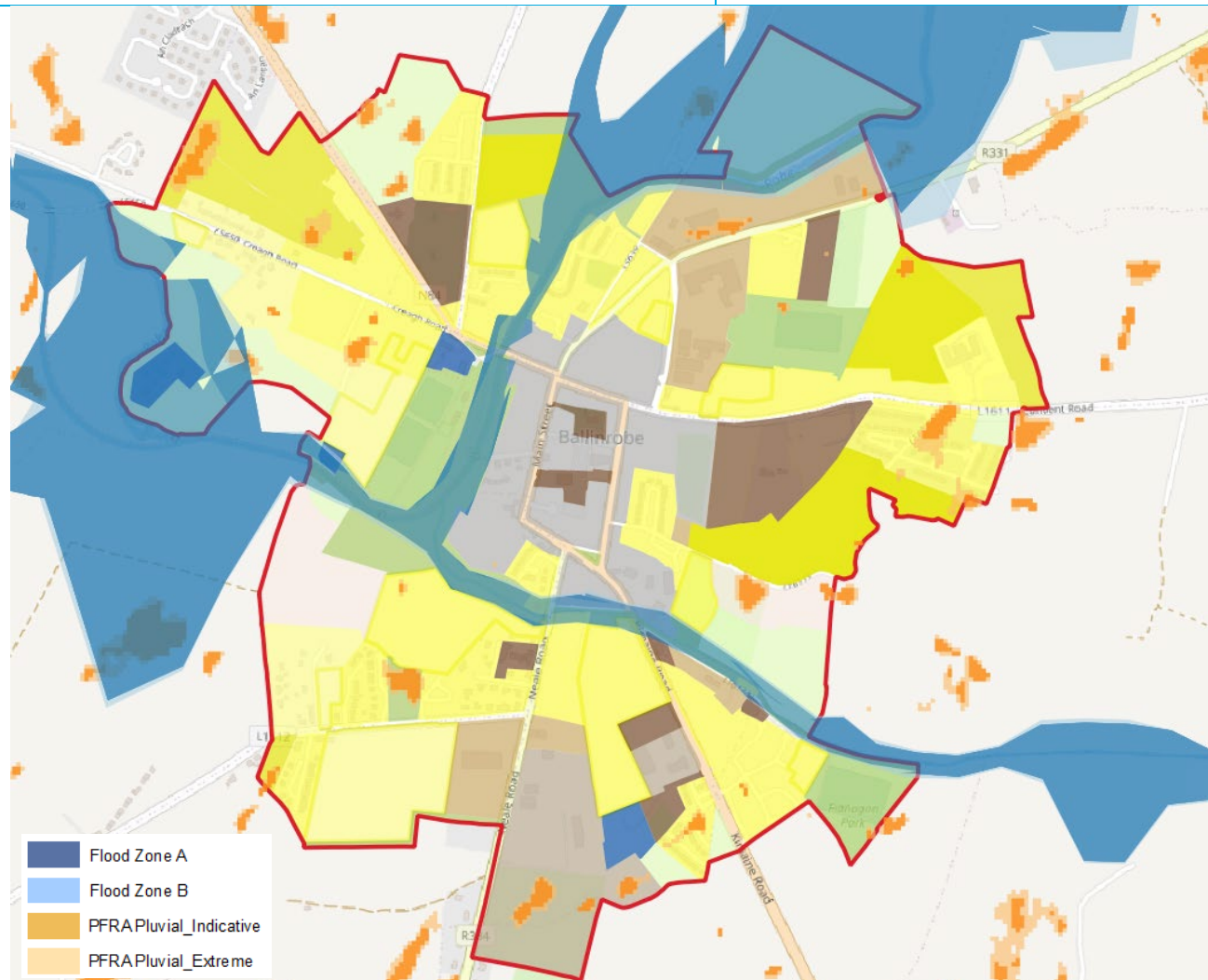
Hierarchy/Tier	Tier 3
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	Flooding was noted in February 2020 as a result of Storm Ciara, the extent of the flooding is unknown. Historical recurring flooding of the N60 road south of Balla from the Pollavaddy turlough. It is noted that this issue has been resolved with the installation of an overflow pipe.
Comment	Significant predicted flood extents noted from the Loughnaminoe Stream flows which through Balla town centre in a southerly direction. Low lying land adjacent to the stream is impacted and this is predicted to include existing commercial and residential property and undeveloped lands. There is a significant area of predicted pluvial flooding on undeveloped lands to the east of the settlement, and in the north west.
Climate Change	High sensitivity to increase in flow and rainfall.
Conclusion	The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. This is essential for the undeveloped lands to the south of the centre that are adjacent to the channel. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Particular care should be taken for lands predicted to be at pluvial risk and a Stage 3 FRA will be required at development management stage. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.8 Ballindine

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	Turlough located to the north west of the settlement. No fluvial flood events recorded
Comment	Significant predicted flood extents noted from the Ballindine River flows which through the village centre in a northerly direction. Low lying lands adjacent to the stream are impacted and this is predicted to include existing commercial and residential property and undeveloped lands.
Climate Change	Moderate sensitivity to increase in flow
Conclusion	The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. The undeveloped lands must employ this approach. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.9 Ballinrobe

Hierarchy/Tier	Tier 2
Area for Further Assessment under CFRAM programme?	No



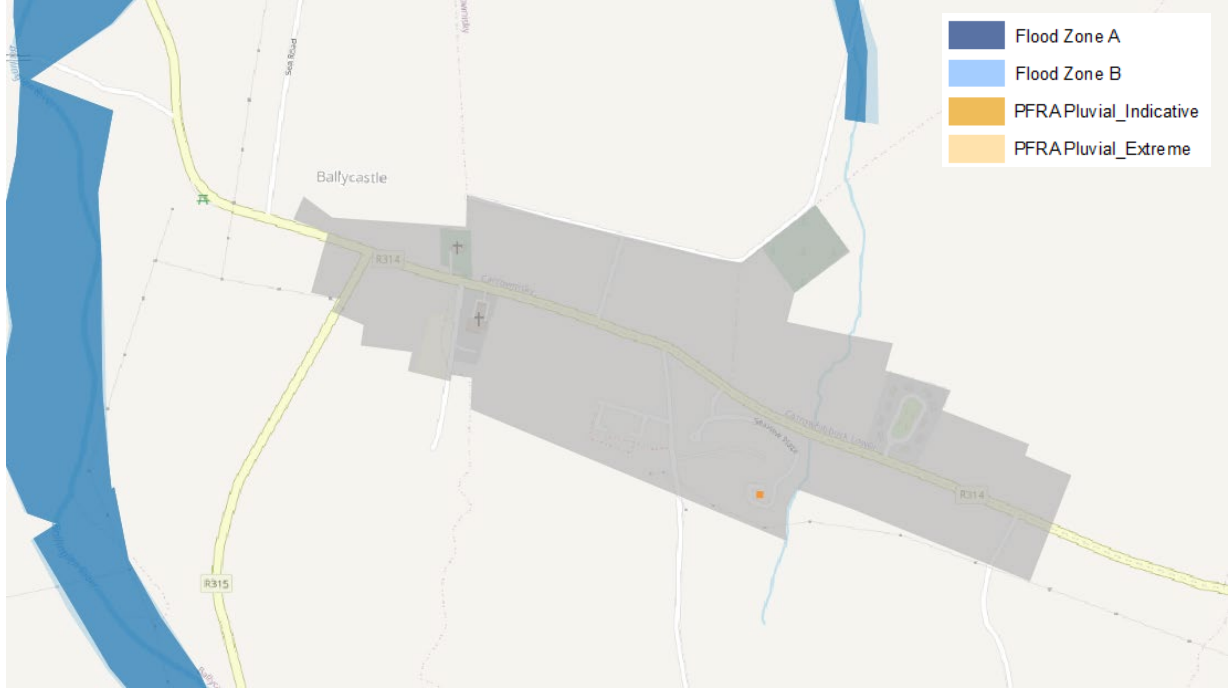
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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA amended by CFRAM Flood Risk Review
Historic Flooding	In the Ballinrobe area between November 2006 and January 2007 unprecedented levels of flooding was caused by prolonged periods of intense rainfall. There are 2 turloughs located in vicinity. Turloughosheenan located to east and Turloughmarlagh located north west of the settlement. No historic flooding of the town is noted.
Comment	The original PFRA flood outlines in Ballinrobe show extensive flooding of property in and around the town centre from the River Robe. Much of this is within the 10% AEP flood outline. Upstream of the town centre the properties on the left bank are raised some way above the river and have a lower floodplain on the opposite bank. PFRA outlines were adjusted on this basis by the

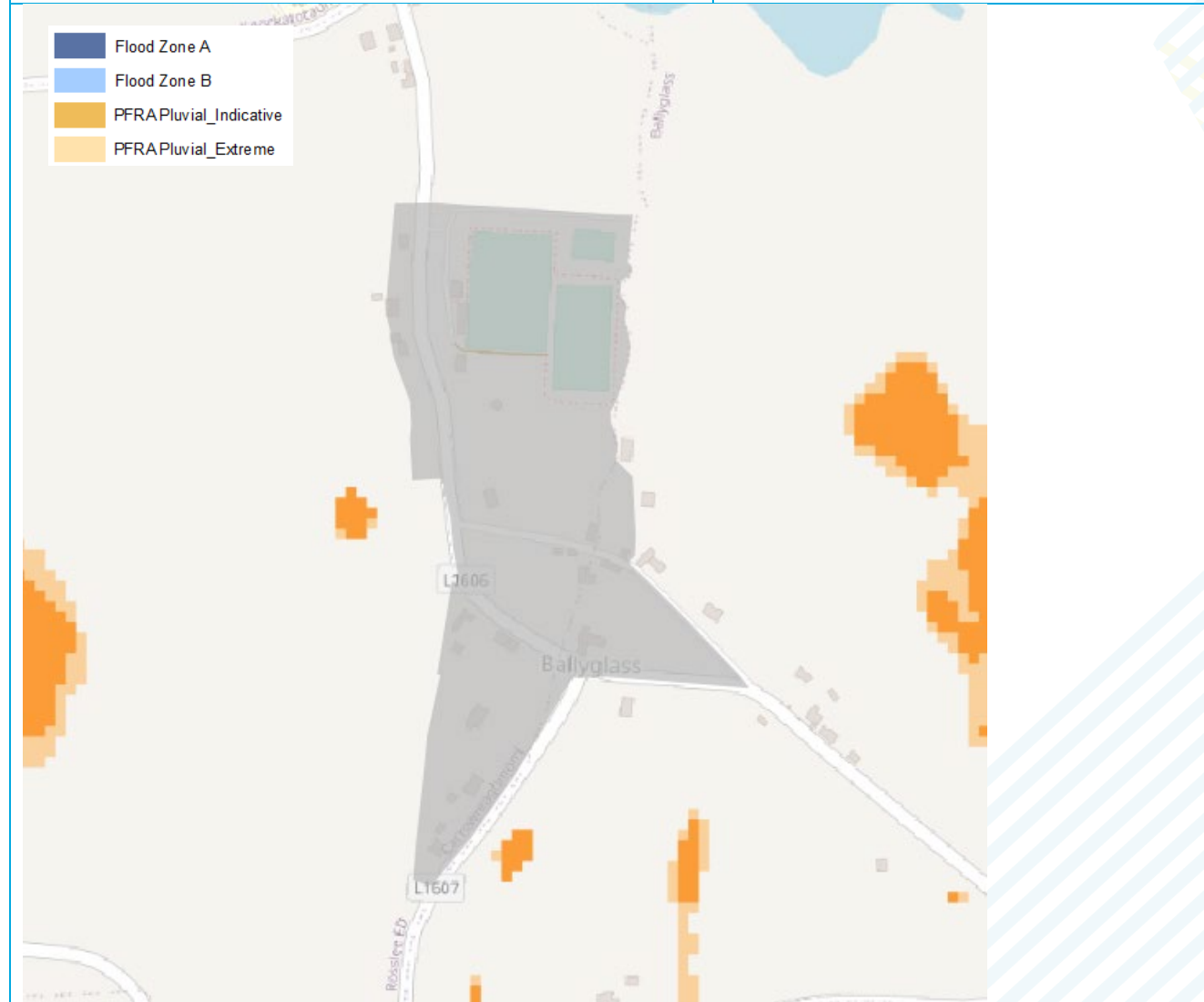
	<p>CFRAM flood risk review and we have adopted these for the SFRA after further site verification.</p> <p>Approaching the town centre the properties remain raised but now on both banks. Water levels in this area are now controlled by the weir and footbridge structure by the derelict flour mill. However, the structure will be overtopped before property levels are reached.</p> <p>The Bridge Street bridge is a large structure at which the road and properties are raised high above the river. It is unlikely there would be any significant risk in this area and PFRA outlines have been adjusted once more. Downstream of Bridge Street the river is canalised and risk is low.</p> <p>The Rathkelly River flows through the southern part of Ballinrobe before joining the River Robe. It flows through two key culverts under main roads. Both these culverts will restrict flows and may exacerbate water levels and flooding in these areas. The PFRA have not been adjusted here.</p> <p>All undeveloped residential and town centre zoning within Flood Zone A/B have applied the sequential approach where possible. The exception to this is some proposed medium density residential lands which are adjacent to the Rathkelly River and are subject to an extant planning permission.</p>
<p>Climate Change</p>	<p>The canalised nature of the channel through the town and the high offset in ground levels is likely to reduce the potential impacts of climate change through the centre of the town.</p>
<p>Conclusion</p>	<p>The Flood Zone extents have been reviewed and amended as far as possible, and this has informed the application of the sequential approach. The Flood Zones remain indicative and are still conservative and have been verified so as to inform zoning decisions.</p> <p>It is important that any new development adjacent to or within the Flood Zones is subject to a detailed Stage 3 FRA that quantifies the flood levels and risk and that the Development Management Justification Test is applied, where necessary.</p> <p>If extant permissions expire then any new planning application will need to conduct a Stage 3 Detailed FRA, likewise for any Extension of Duration application. If the application lapses and there is a Variation or new Draft CDP then the land should be assessed as undeveloped and the sequential approach applied when zoning.</p> <p>Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.10 Ballycastle

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	The Carrownisky River flows through Ballycastle settlement in a northerly direction. The Carrowkibbock Lower Stream joins the Carrownisky River within the settlement boundary.
Climate Change	Low to moderate sensitivity to increase in flows.
Conclusion	Risk should be assessed for any development on lands adjacent to the river through a detailed Stage 3 FRA, it is important that the sequential approach is applied and Flood Zone A/B is maintained as open space. Any new development should follow the guidance provided in Section 7. Detailed modelling under a Stage 3 FRA would improve the reliability of the assessment. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.11 Ballyglass

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No

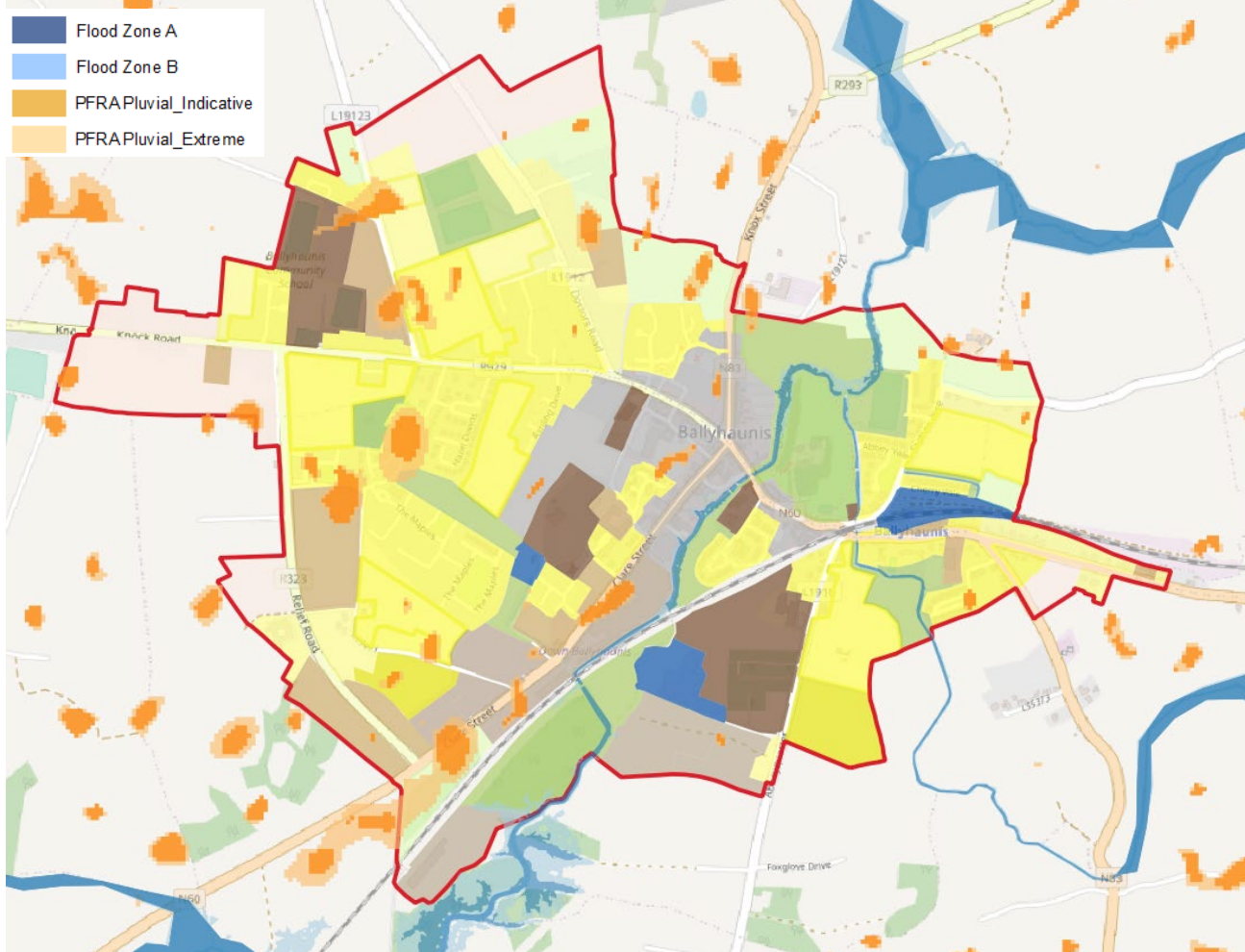


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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA pluvial
Historic Flooding	Turloughs located to the east and north east of settlement
Comment	A small stream is noted to the north east of the settlement at the location of the Turlough. This is outside the settlement boundary.
Climate Change	Low sensitivity to increase in flows.
Conclusion	Risk is low but should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.12 Ballyhaunis

Hierarchy/Tier	Tier 2
Area for Further Assessment under CFRAM programme?	Yes
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM & PFRA pluvial
Historic Flooding	Flood event was recorded in 1999, Dalgan river overflow banks and flooded Donnellans Joinery, a result of heavy rainfall.
Comment	<p>There is a relatively low level of flood risk to this community from rivers and/or the sea, and no structural flood relief measures are therefore proposed under the CFRAM.</p> <p>The River Daigan flows through Ballyhaunis town but does not come significantly out of bank. This river flows from north to the south. The Friarsground Watercourse is a tributary of the River Daigan and enters it to the north east of Ballyhaunis town. The third watercourse in Ballyhaunis is the Abbeyquarter Watercourse. This small watercourse flows to the east of Ballyhaunis and is a tributary of the Friarsground Watercourse. The CFRAM study has provided Flood Zone data that confirms the high capacity of the river channel (OPW Arterial Drainage Scheme) and relatively low risk though the town.</p>

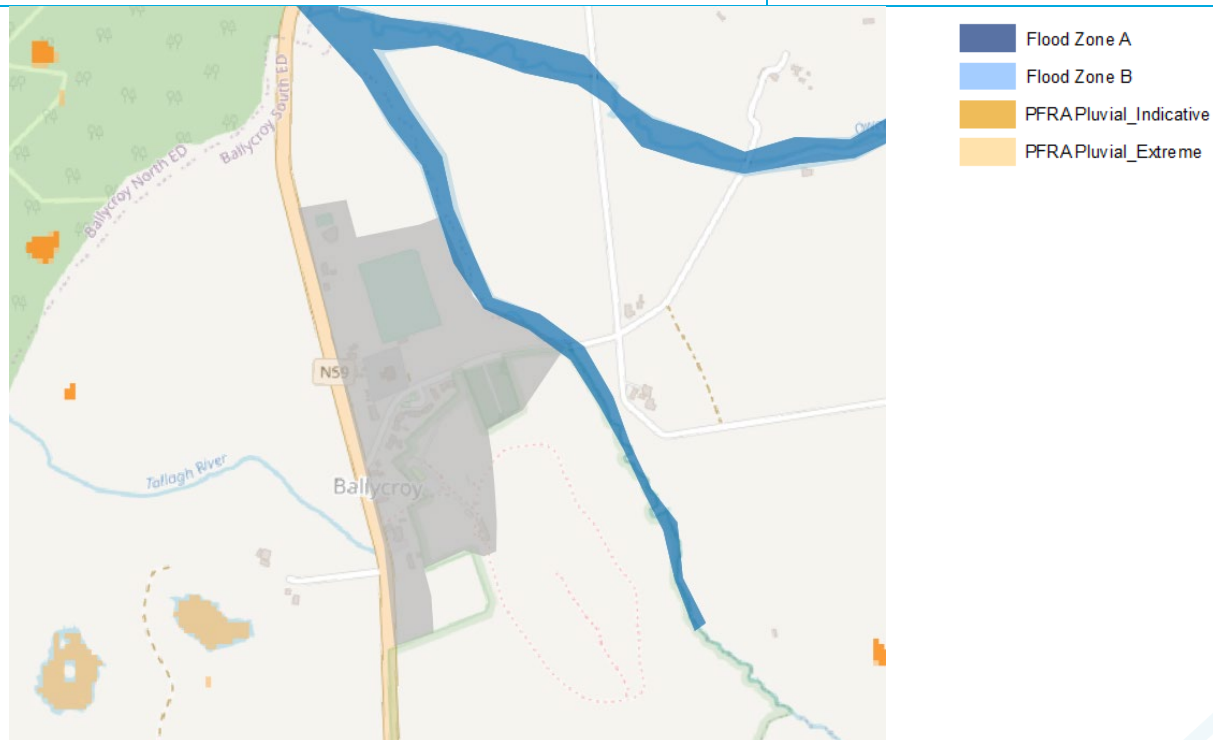
Climate Change	Low sensitivity due to high channel capacity.
Conclusion	<p>It is important that any new development adjacent to or within the Flood Zones is subject to a detailed Stage 3 FRA that quantifies the flood levels and risk and that the Development Management Justification Test is applied, where necessary. The consideration of residual risk (culvert blockage) is important.</p> <p>Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.13 Ballyheane

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Significant predicted flood extents noted from the Claureen River, which flows through Ballyheane in a southerly direction, and the Derrynagooley Stream, which flows in a south easterly direction through the settlement and joins the Claureen River. Low lying land adjacent to the watercourses are impacted and this is predicted to include existing commercial, community and residential property and undeveloped lands.
Climate Change	Moderate sensitivity to increase in flow
Conclusion	A Stage 3 FRA will be required for any potential development within or adjacent to the Flood Zones. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.14 Ballycroy

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No



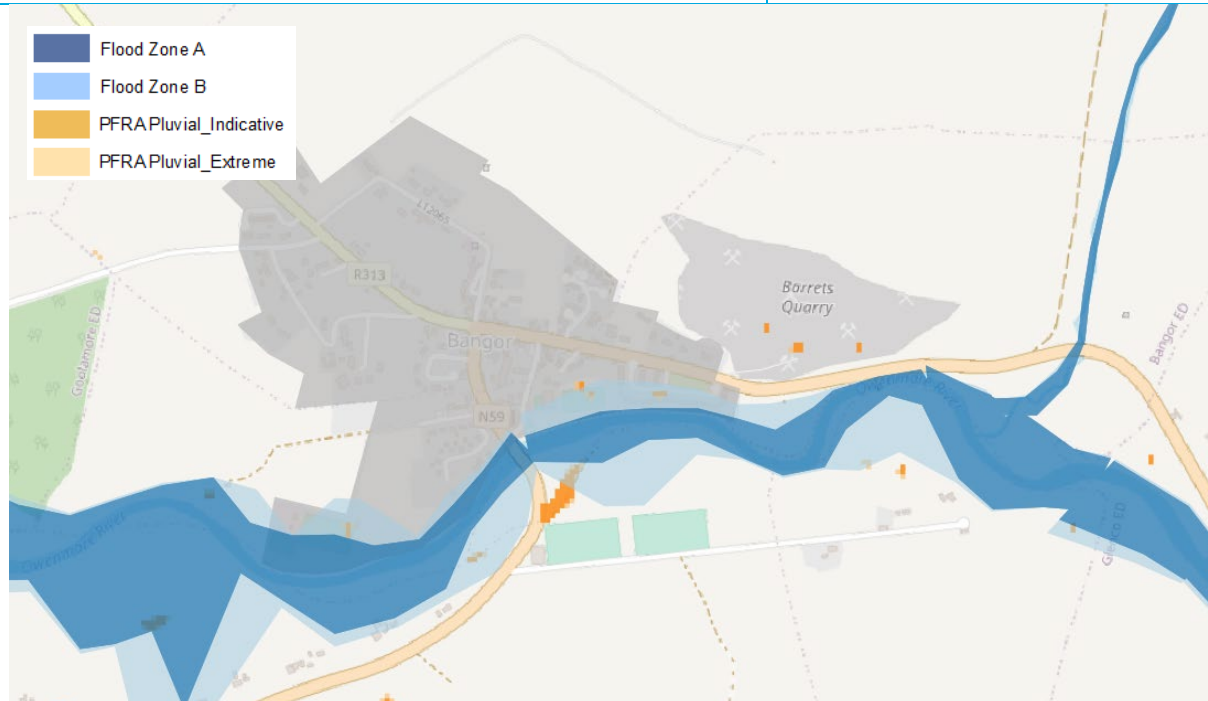
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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	A watercourse flows along the eastern boundary of the settlement and the flood extents do not impact any property. The Tullagh River rises to the west of the settlement.
Climate Change	Moderate sensitivity to increase in flow
Conclusion	A Stage 3 FRA will be required for any potential development within or adjacent to the Flood Zones or river channel. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.15 Bangor Erris

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No



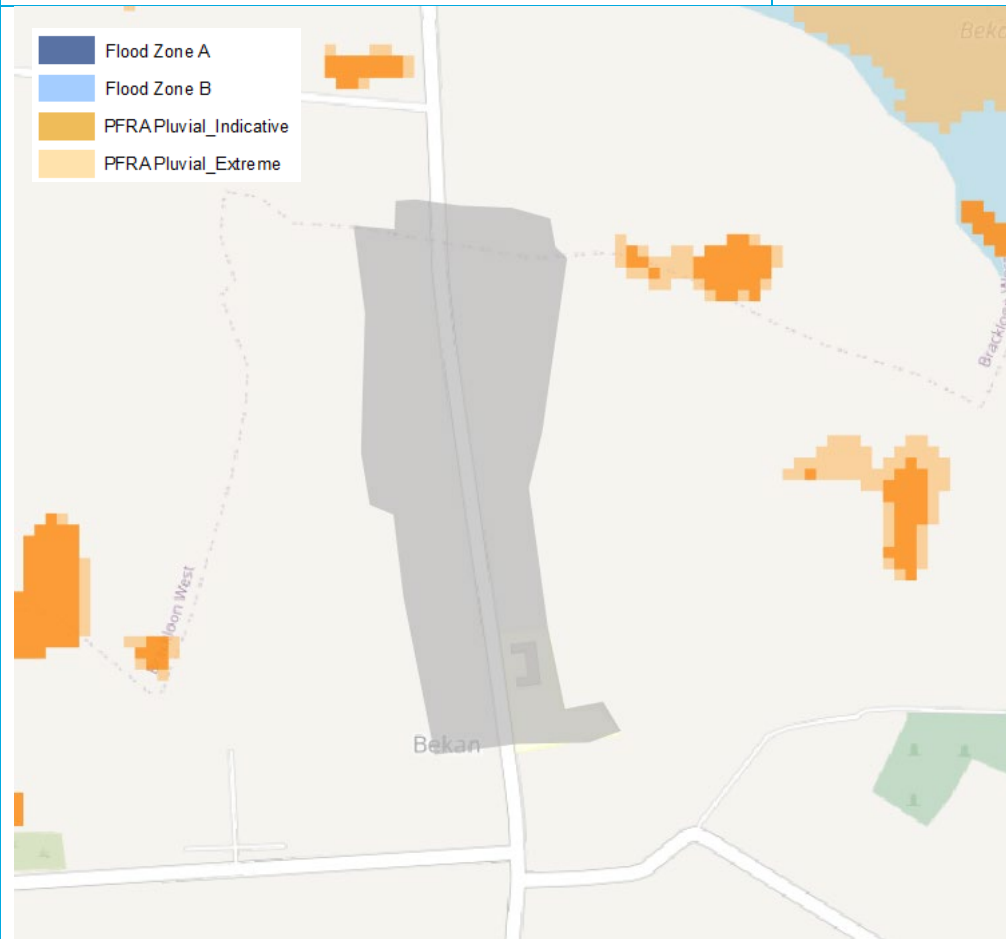
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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Significant predicted flood extents noted from the Owenmore River, which flows along the southern periphery of the settlement in a westerly direction. Lands adjacent to the watercourses are impacted and this is predicted to include existing commercial, and residential property and undeveloped lands. The Ballybeg stream flows through the village centre before joining the Owenmore River.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	A Stage 3 FRA will be required for any potential development within or adjacent to the Flood Zones. Residual risk of bridge blockage should be considered when assessing property adjacent to the Owenmore River. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.16 Bekan

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No

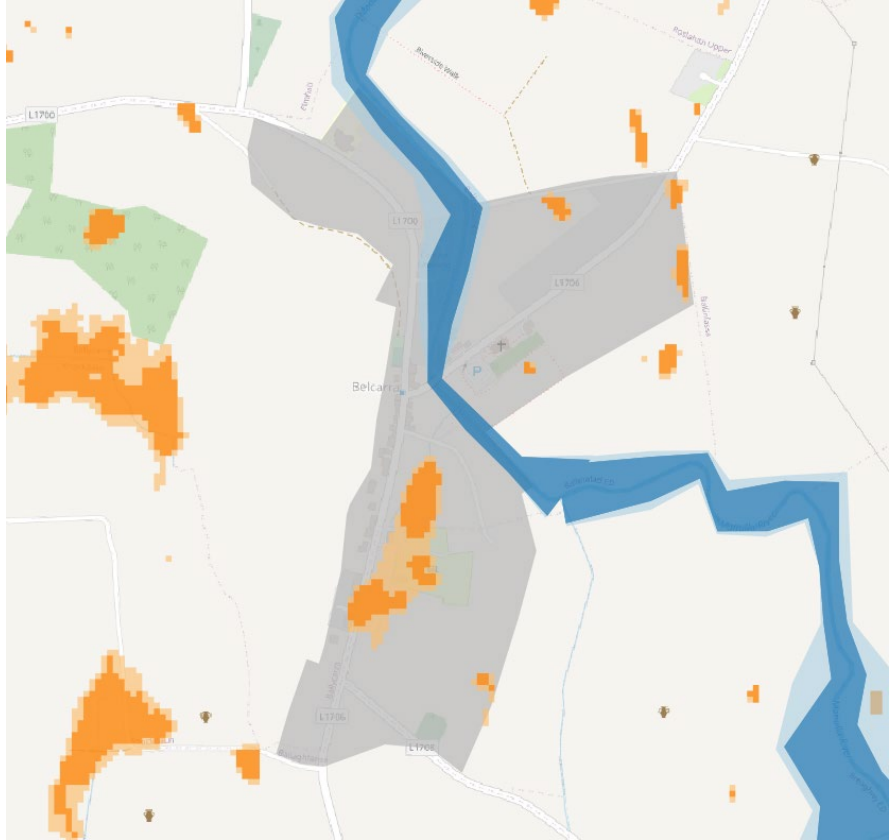


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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

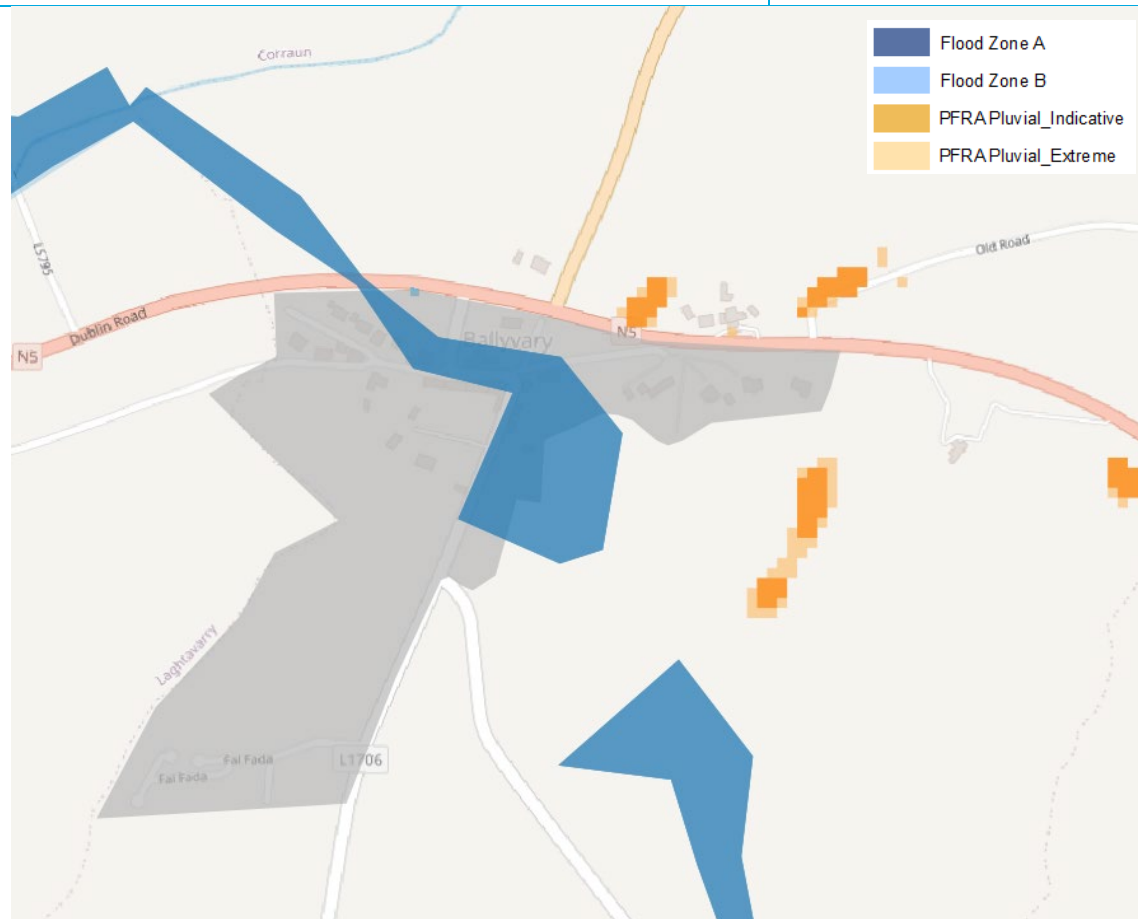
Flood Zone Data	PFRA pluvial
Historic Flooding	No historic records of flooding were found
Comment	Risk is limited to limited areas of predicted pluvial ponding.
Climate Change	Low sensitivity to an increase in fluvial flow, Possible increase in runoff.
Conclusion	Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.17 Belcarra

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	Turloughs located to the east and north east of settlement, no historic flooding noted.
Comment	Predicted flood extents noted from the Manulla River, which flows through the settlement in a north westerly direction. Lands adjacent to the watercourses are impacted and this is predicted to include existing commercial, and residential property and undeveloped lands.
Climate Change	Moderate sensitivity to increase in flows
Conclusion	A Stage 3 FRA will be required for any potential development within or adjacent to the Flood Zones. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.18 Bellavary

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No



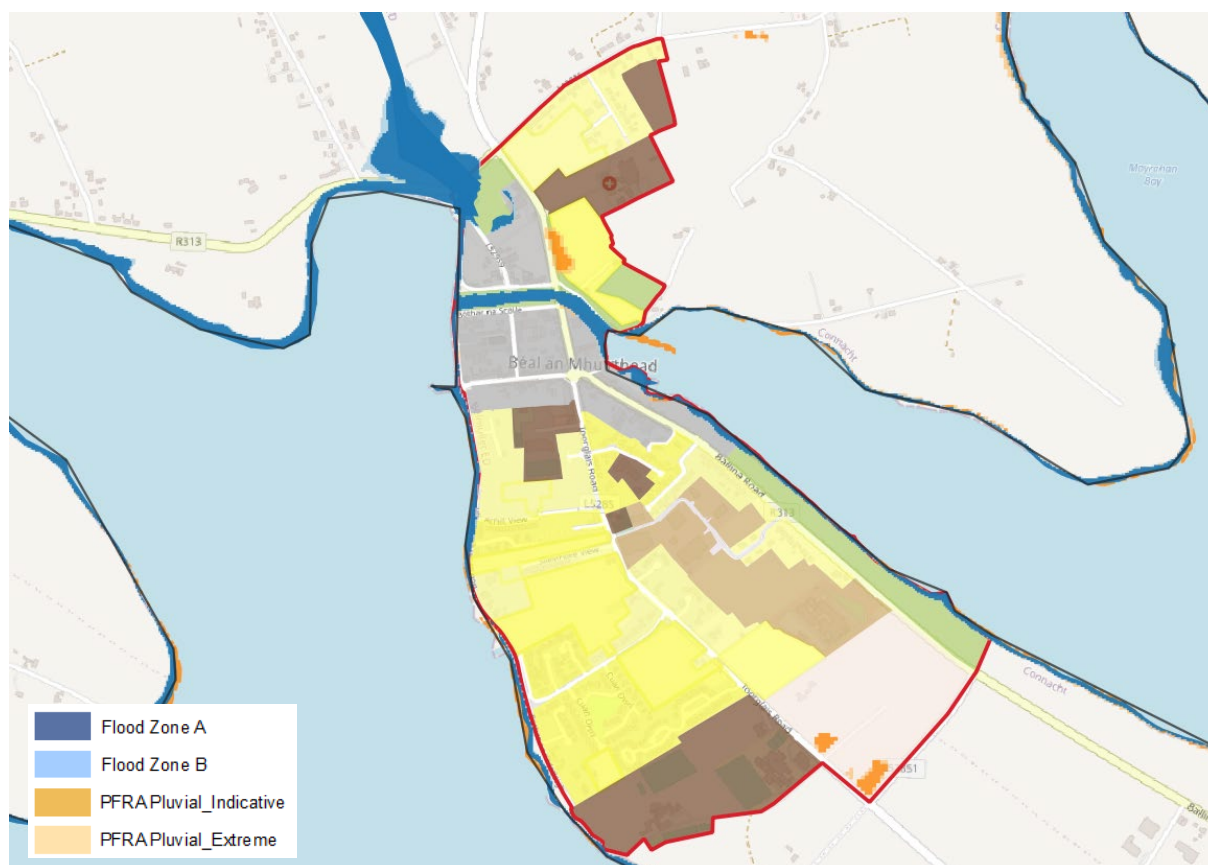
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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Predicted flood extents noted from the Danganmore River, which flows through the settlement in a north westerly direction. Lands adjacent to the watercourses are impacted and this is predicted to include existing commercial, and residential property and undeveloped lands.
Climate Change	Low sensitivity to increase in flows
Conclusion	Any new development should generally follow the guidance provided in Section 7. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk should be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.19 Belmullet

Hierarchy/Tier	Tier 2
Area for Further Assessment under CFRAM programme?	No

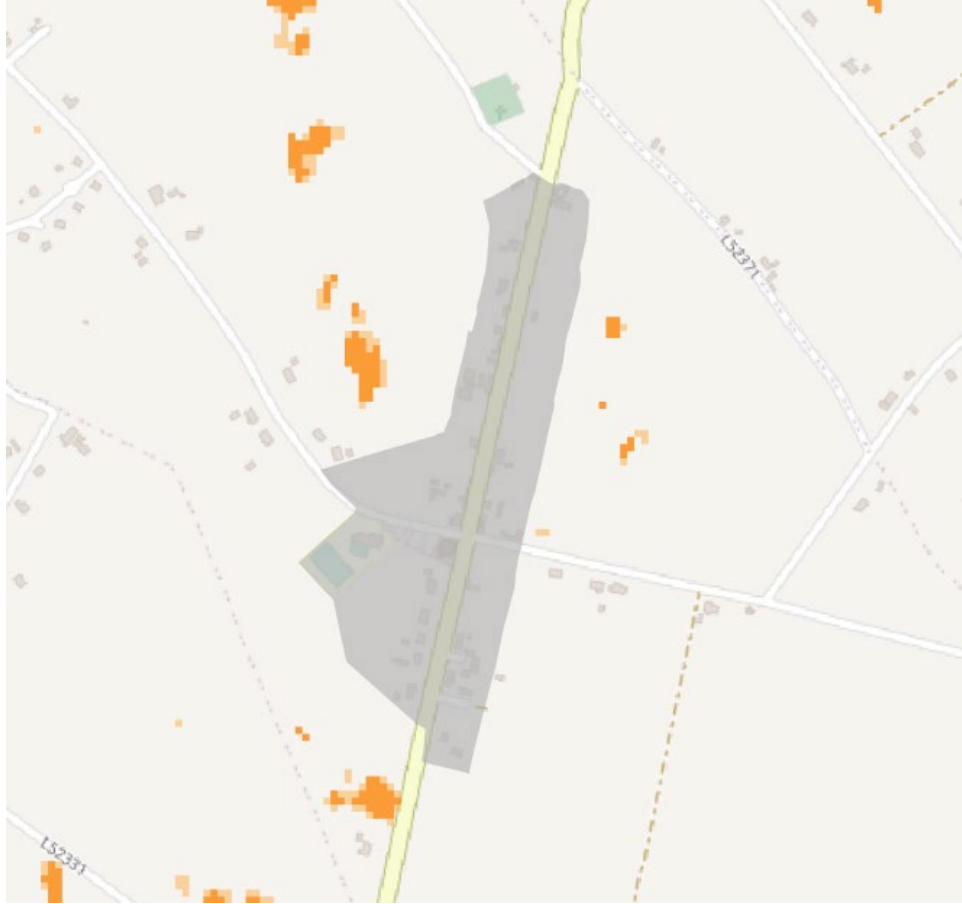


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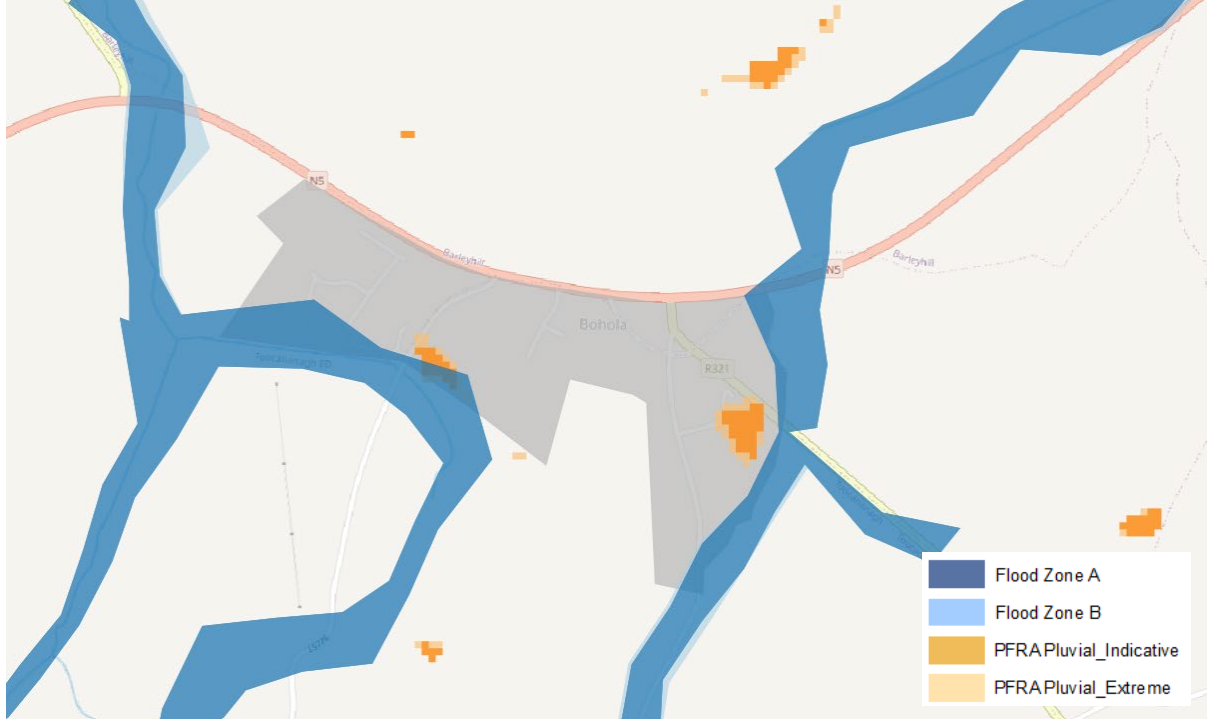
The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	Coastal flooding as reported in October 2018 as a result of breach of sea wall.
Comment	The principal risk to the settlement is from coastal flood risk, however the level of risk is low and refined to the low lying fringe of the settlement.
Climate Change	The low-lying area of the settlement which is influenced by tidal flooding would be highly sensitive to the impacts of climate change.
Conclusion	Risk is generally low and can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.20 Binghamstown

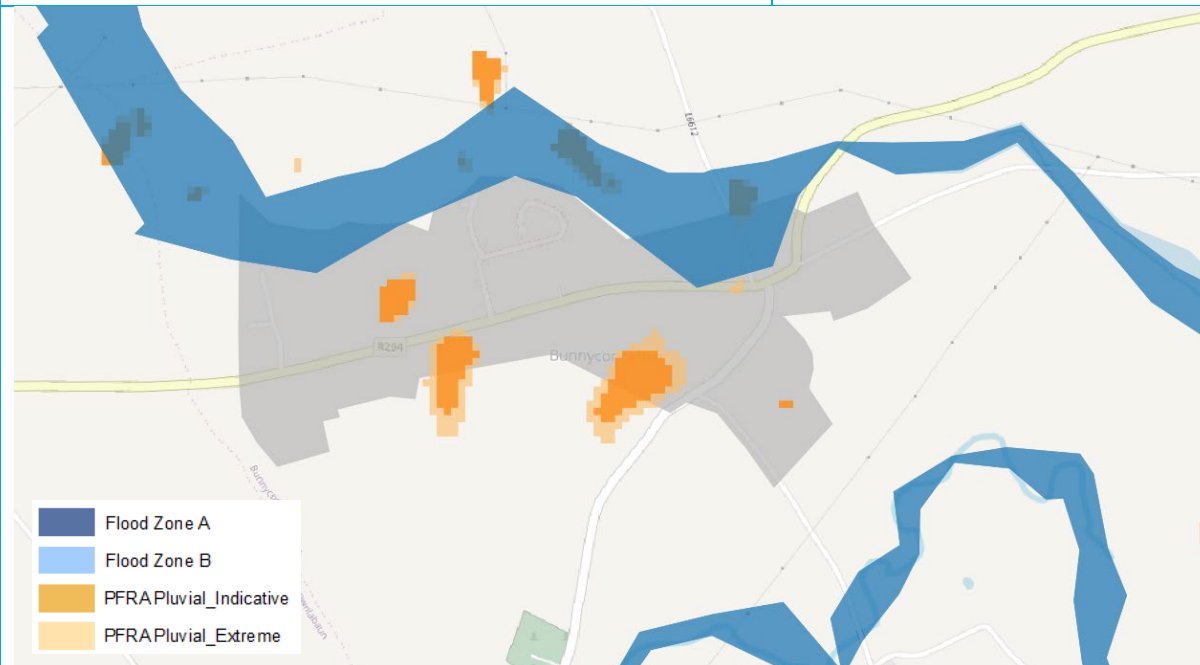
Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA pluvial
Historic Flooding	No historic records of flooding were found
Comment	The Baile Mhic Sheathruin River is located outside of the settlement boundary and flows in a south easterly direction before joining into the An Currach Bui River.
Climate Change	Low sensitivity to increase in flows
Conclusion	<p>Any new property on the southern periphery of the settlement should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk posed by the Baile Mhic Sheathruin River. The sequential approach should be applied and Flood Zone A/B maintained as open space.</p> <p>Risk is generally low and can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.21 Bohola

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	Flooding recorded at Treenduff, Bohola in November 1999, as a result of the Carroward river overflowing
Comment	Predicted flood extents noted from the Carroward River, which flows through the settlement in a westerly direction, and the Clonneen River, which flows along the eastern periphery of the settlement in an northerly direction. Lands adjacent to the watercourses are impacted and these are within the settlement boundary.
Climate Change	Low sensitivity to increase in flows.
Conclusion	<p>Any new property on the southern or eastern periphery of the settlement should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.22 Bonniconlon

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No



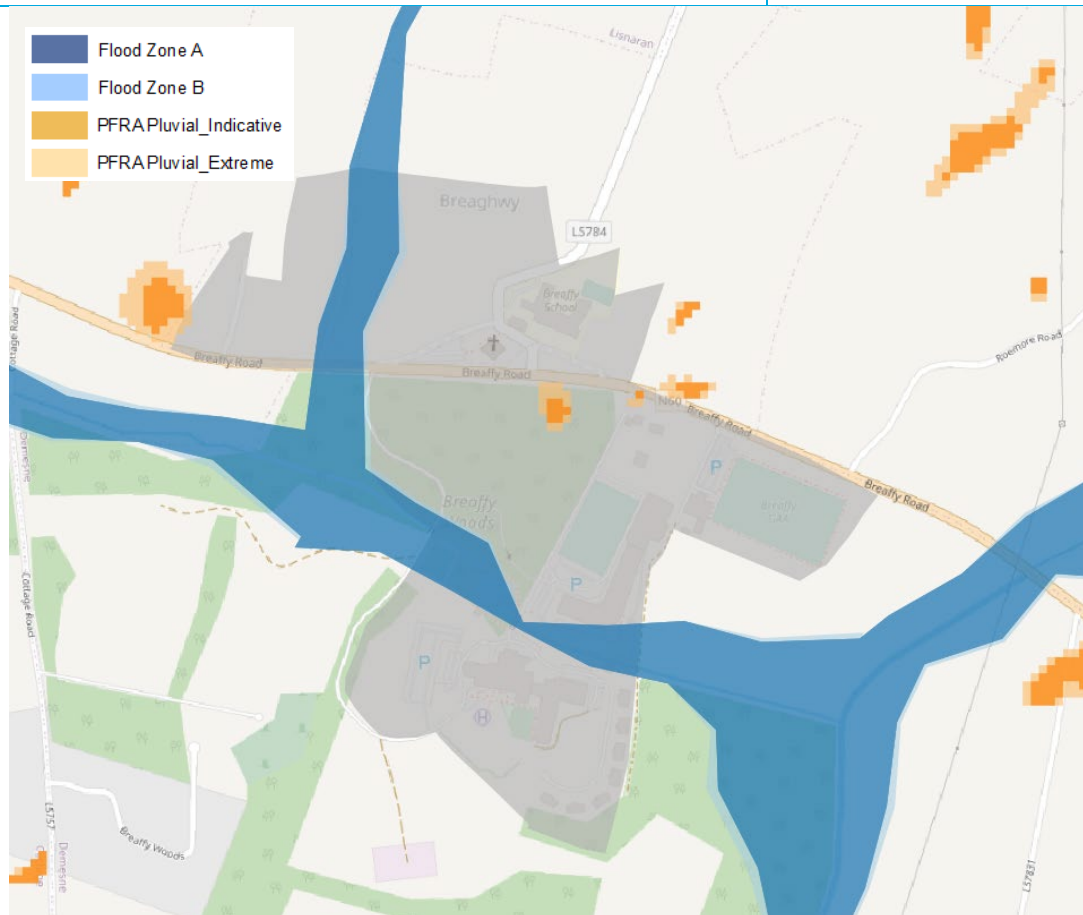
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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Predicted flood extents noted from the Bunnyconnlean West River, which flows along the northern boundary of the settlement in a westerly direction, lands within the settlement boundary are impacted.
Climate Change	Low sensitivity to increase in flows.
Conclusion	<p>Any new property on the northern periphery of the settlement should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.23 Breaffy

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No



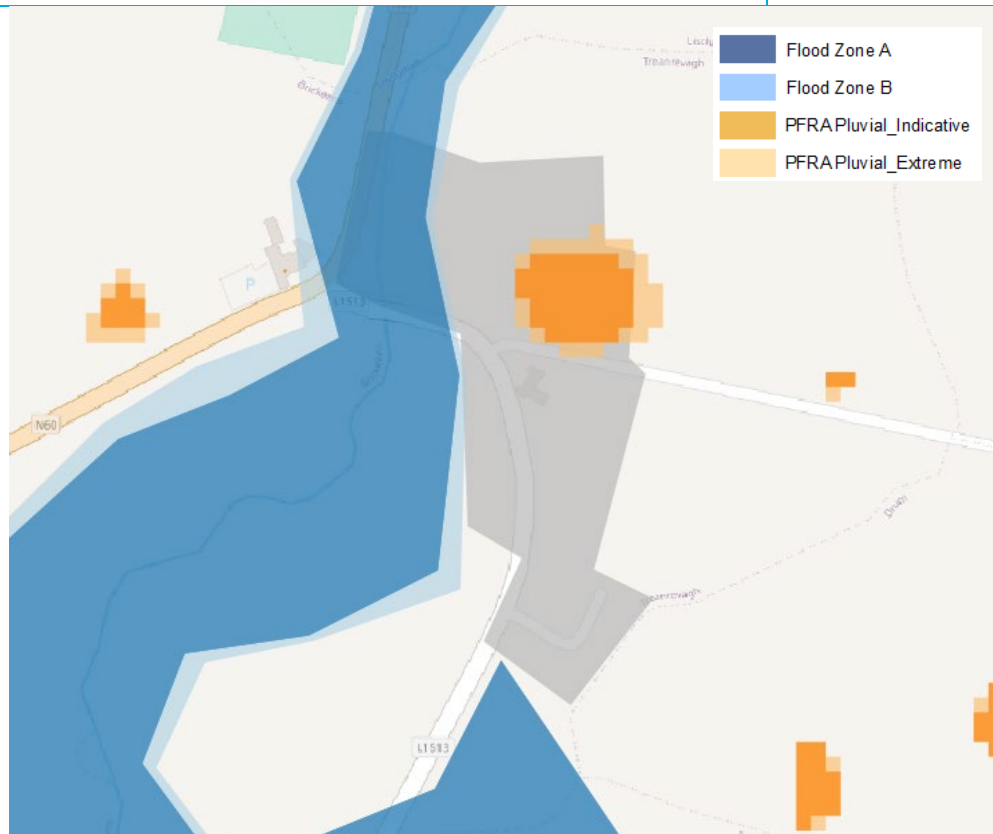
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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Predicted flood extents noted from the Pollanaskan River, which flows through the settlement in a south westerly direction. Within the settlement boundary lands adjacent to the watercourses are impacted.
Climate Change	Low sensitivity to increase in flows.
Conclusion	Any new property within or adjacent to the Flood Zones should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.24 Brickens

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No



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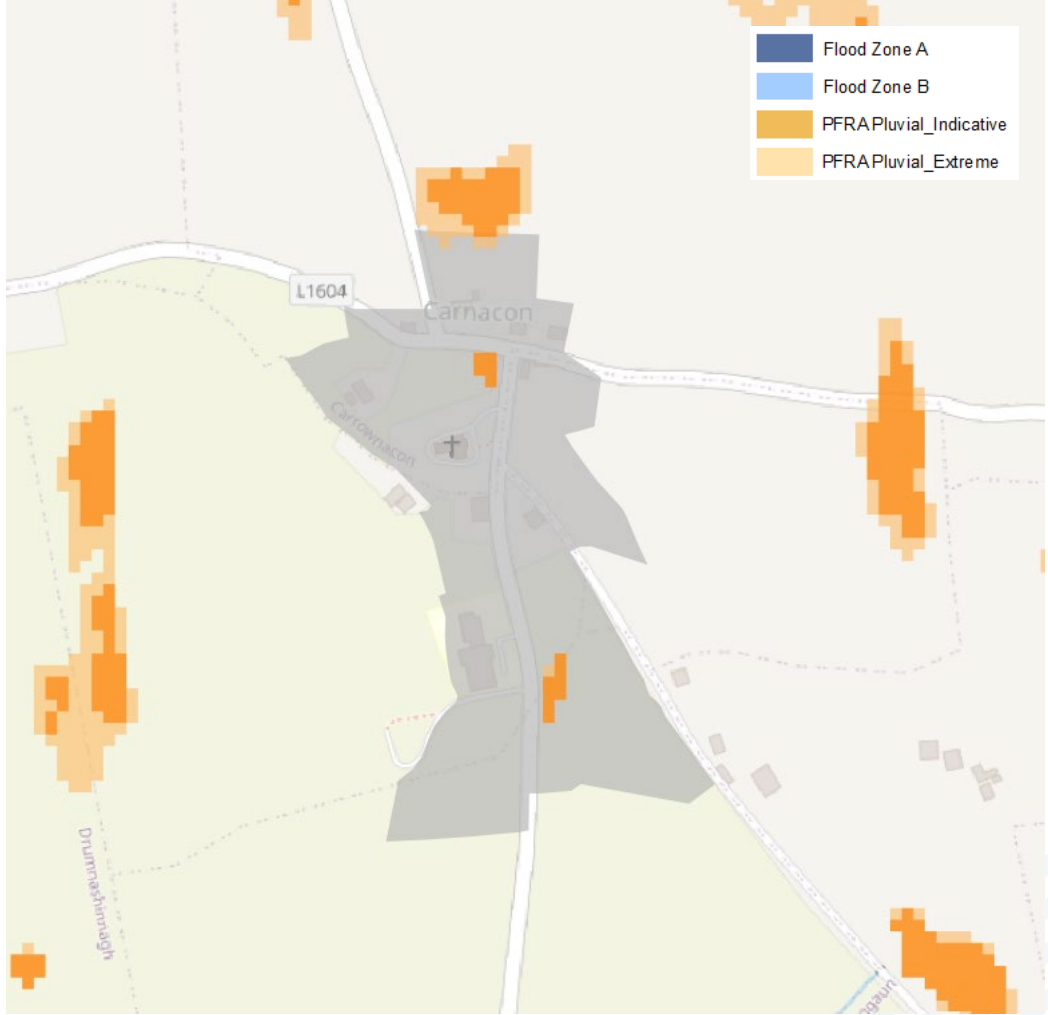
The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	Predicted flood extents noted from the OPW Drainage Channel, which flows through the settlement in a northerly direction. Within the settlement boundary lands adjacent to the river are impacted including some existing development, however it is likely the PFRA mapping is overestimated.
Climate Change	Low sensitivity to increase in flows.
Conclusion	<p>Any new property within or adjacent to the Flood Zones should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. The area of localised pluvial flooding predicted by the PFRA should preferentially be avoided for highly or less vulnerable development.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.25 Bunnacurry

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	There is a field drain that flows in a south easterly direction through the settlement and outfalls into Bunnacurry Harbour. The drain could be influenced by tidal sources.
Climate Change	Due to potential tidal impacts, the area would be highly sensitive to the impacts of climate change.
Conclusion	<p>Any new property within or adjacent to the Flood Zones, or near to a field drain should include a site specific Stage 3 FRA that specifically quantifies the water levels and climate change impacts. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.26 Carnacon

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Some predicted flooding, remote from the settlement.
Climate Change	Low sensitivity to increase in fluvial risk
Conclusion	Risk is generally low and can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.27 Carracastle

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No




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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Predicted flood extents noted from the Fauleens River, which flows through the settlement in a north easterly direction. Lands adjacent to the watercourse are impacted. The Cashelduff River also flows in an easterly direction through the settlement before joining into the Fauleens River, this is unmapped by the CFRAM.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	<p>Any new property within or adjacent to the Flood Zones or river channel of either the Fauleens River or the Cashelduff River should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.28 Carrowteige

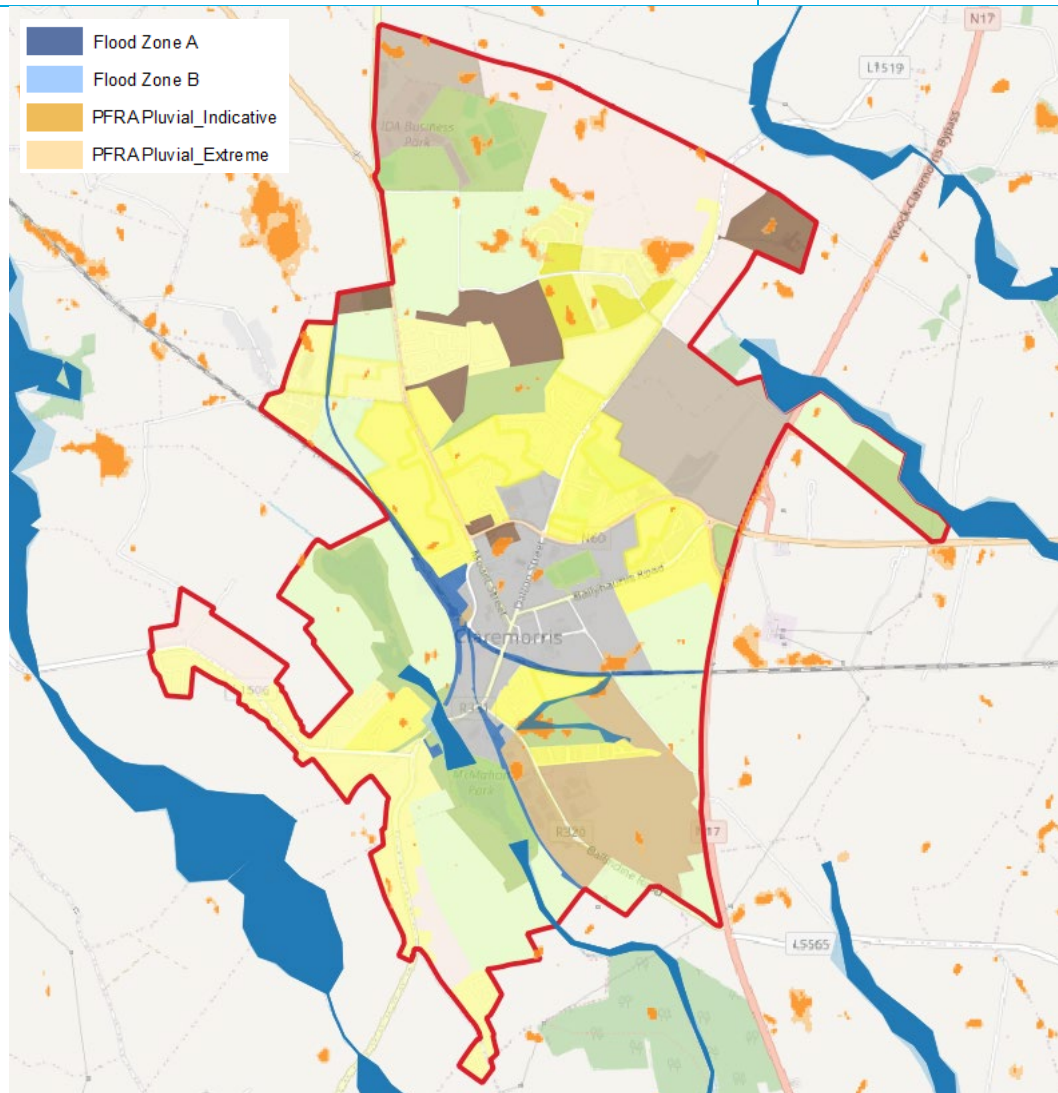
Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	n/a
Historic Flooding	No historic records of flooding were found.
Comment	There are no predictive flood outlines for this settlement. There are watercourses located outside the settlement boundary and these are unlikely to impact the settlement.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.29 Charlestown

Hierarchy/Tier	Tier 3
Area for Further Assessment under CFRAM programme?	Yes
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM and PFRA
Historic Flooding	No historic records of flooding were found
Comment	There is a relatively low level of flood risk to Charlestown and under the CFRAM no structural flood relief measures were proposed. The flood risk maps for the Charlestown AFA have not highlighted any properties within the 1% AEP flood event.
Climate Change	Moderate to high sensitivity to climate change.
Conclusion	<p>As stipulated in the CFRAM management plan, the form and capacity of the existing river channels should not be altered and ensuring structures currently containing or diverting flows continue to do so. It will be necessary to apply the sequential approach and preserve Flood Zone A/B for water compatible use.</p> <p>Any new property within or adjacent to the Flood Zones, or near to a field drain should include a site specific Stage 3 FRA that specifically quantifies the water levels and climate change impacts. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.30 Claremorris

Hierarchy/Tier	Tier 2
Area for Further Assessment under CFRAM programme?	No



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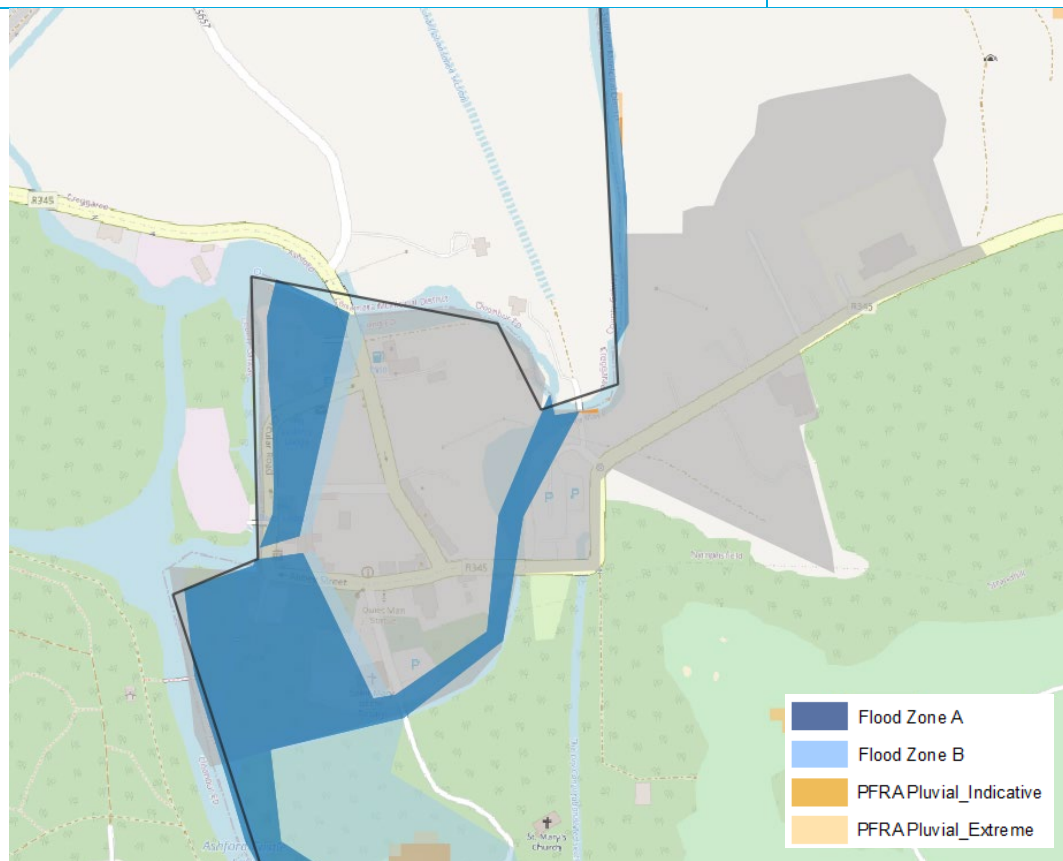
The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	None found
Comment	Clare Lake and Mayfield Lake are located to the west of the town centre and drain in a southerly direction (Arterial Drainage channel). There is some potential risk around these drains but the land use is water compatible within Flood Zone A. An OPW Arterial Drainage channel flows into the lake from the east via a culvert. Upstream of the culvert risk adjacent to the channel is low and on the day of the site visit the drain was being maintained by the OPW. Upstream the channel (CM4/32) bifurcates and passes along the boundary of some undeveloped residential and some Enterprise & Employment lands. Another OPW Arterial Drainage channel (CM4/43) also flows adjacent

	to some undeveloped Industrial land in the northeast of the settlement
Climate Change	Low to moderate.
Conclusion	<p>As per Flood Risk Policy INO18 any new development adjacent to the arterial drainage channels should liaise with the OPW regarding the riparian strip either side of the channel. Any such development should also complete a Stage 3 FRA that specifically quantifies water levels and risk.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA</p>

8.31 Cong

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No




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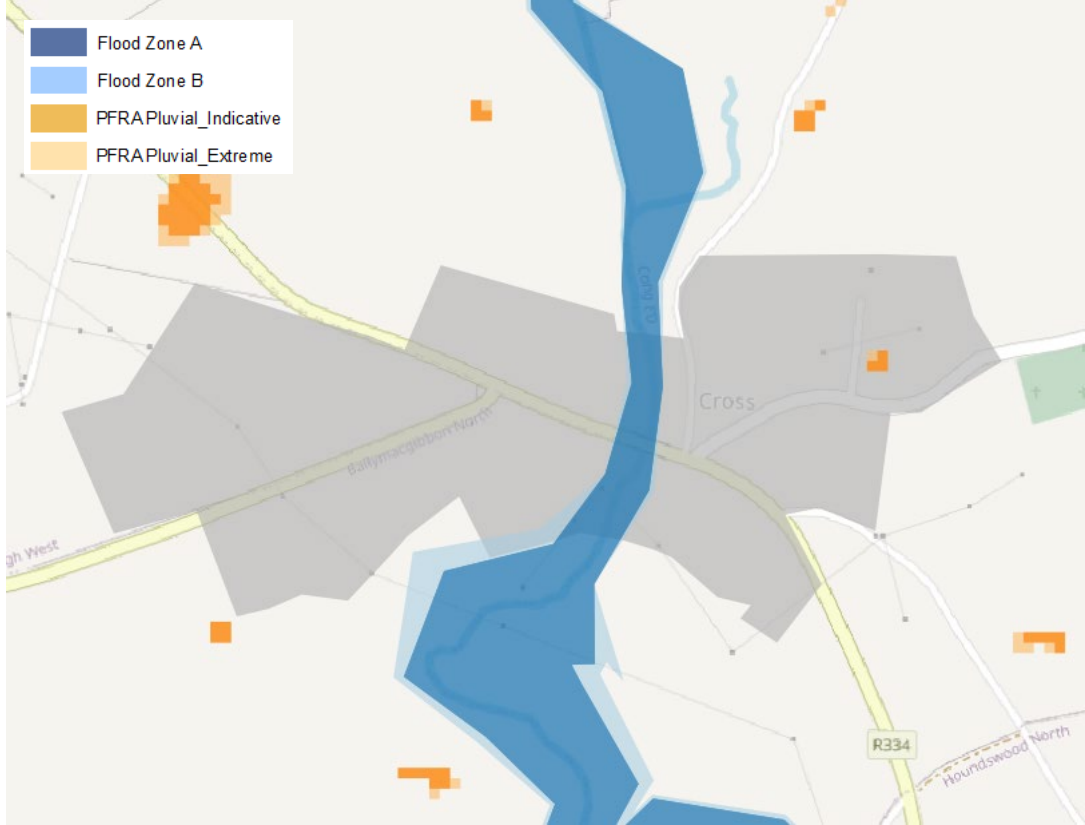
The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	Flooding was recorded on the 7 th of February 1990 in the vicinity of the bridge to Monks Island.
Comment	Predicted flood extents noted from the Cong Canal, which flows through the settlement in a southerly direction, and the Lislaughtrea River, which flows in a south westerly direction into the Cong Canal. Lands adjacent to the watercourses are impacted and this is predicted to include existing town centre lands.
Climate Change	Low sensitivity to increase in flows.
Conclusion	Any new property within or adjacent to the Flood Zones or river channel should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.32 Corclough

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	A watercourse is located to the east of the settlement boundary. Risk is low.
Climate Change	Low sensitivity to increase in flows.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.33 Cross

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Predicted flood extents noted from the Kilmaine, which flows through the settlement in a southerly direction. Lands adjacent to the watercourse are impacted through the centre of the settlement. Flood extents are likely to be overestimated by the CFRAM.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	Any new property within or adjacent to the Flood Zones or river channel should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.34 Crossboyne

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	Flooding was recorded along the L-150-48 road in Crossboyne on the 25 th of November 2009.
Comment	Predicted flood extents noted from the Robe River (OPW Arterial Drainage channel), which flows through the settlement in a westerly direction. Lands adjacent to the river are impacted and it is likely that the flood extents are overestimated by the PFRA mapping.
Climate Change	Low sensitivity to increase in flows.
Conclusion	<p>Any new property within or adjacent to the Flood Zones should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Refer to Objective INO18 regarding the development free strip adjacent to the channel.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.35 Crossmolina


Hierarchy/Tier	Tier 3
Area for Further Assessment under CFRAM programme?	Yes
<p>© OpenStreetMap contributors, CC-BY-SA,</p>	
<p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM (Crossmolina FRS) & PFRA
Historic Flooding	<p>Extensive flooding occurred in Crossmolina from the Deel river in October 1989 and resulted in roads and property flooding. Flooding also occurred in December 2006 after a period of heavy rainfall causing the River Deel to overflow its banks. Chapel Street, Church Street, Erris Street and parts of Main Street were flooded during this event. Significant flooding also occurred in November 2015, with the highest on record in December 2015.</p>
Comment	<p>The Deel River flows in a northerly direction through the centre of the Crossmolina settlement. In 2015 over 100 properties flooded and the town is yet to benefit from the construction and finalisation of the flood relief scheme. The flood mapping indicates significant existing property and also undeveloped land is at high risk of flooding, with an overflow route through Abbeystown/Riverwalk, there is also a PFRA watercourse to the north of the town that flows in an easterly direction and impacts undeveloped lands.</p>

Climate Change	A review of CFRAM Flood Zone A and B outlines suggest a moderate increase in fluvial risk.
Conclusion	<p>The pre-scheme Flood Zones and levels should be used to manage flood risk in Crossmolina as the construction works are yet to commence for the FRS. Post-scheme the CFRAM flood levels will offer a robust residual risk scenario against which to derive suitable floor levels (see Section 7 of this document for further guidance) and the FRS should not be used as a driver to develop previously greenfield lands adjacent to the channel, these should be safeguarded as a riparian zone and the Justification Test strictly applied to achieve this standard.</p> <p>Any new property adjacent to the Flood Zones, or re-development/extensions within the Flood Zones, should include a site specific FRA that draws on water level details from the pre-scheme CFRAM flood data. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping for the PFRA watercourse to the north of the settlement is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

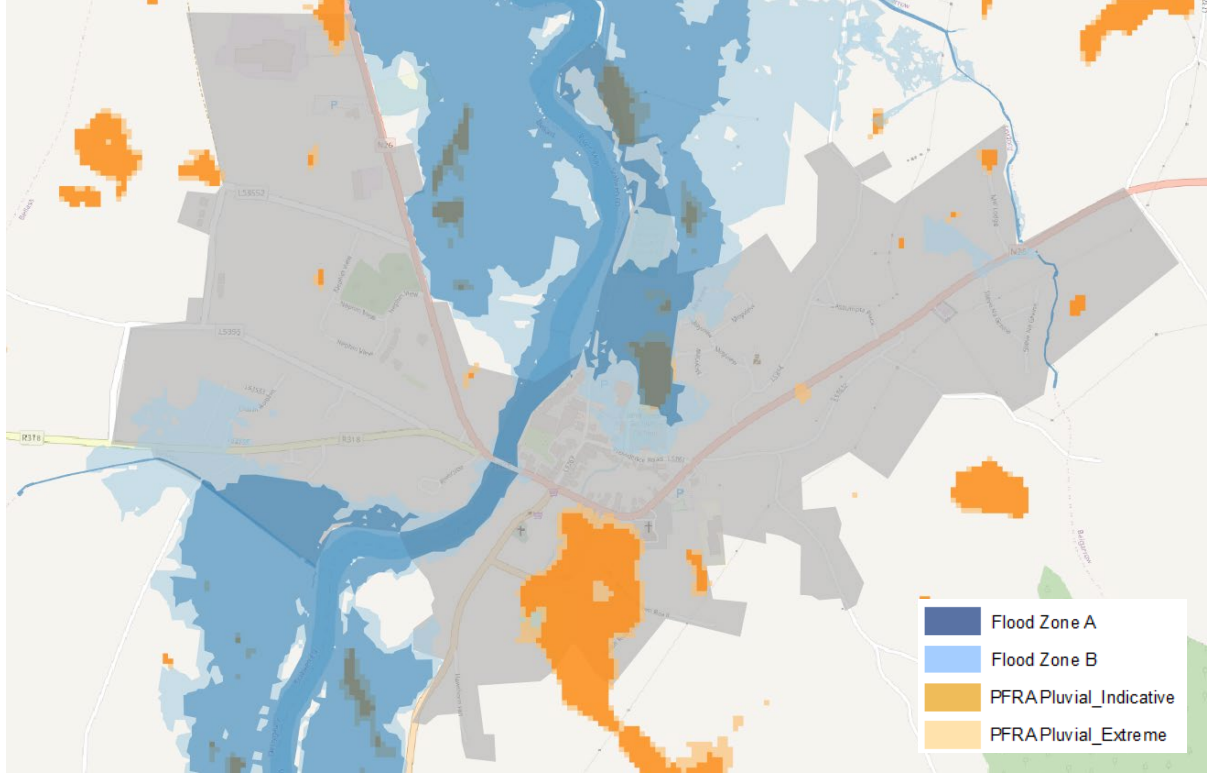
8.36 Doogort

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA/ICPSS
Historic Flooding	Recurring flooding occurs in Dooagh, Doogort during periods of heavy rain when runoff from high ground cannot drain to sea and causes flooding over a stretch of approximately 0.5km of road.
Comment	There are three small streams which flow in a northerly direction through the settlement and outfall into the Pollawaddy Bay. The streams are therefore potentially influenced by both fluvial and tidal sources.
Climate Change	The low-lying area of the settlement which is influenced by tidal flooding would be highly sensitive to the impacts of climate change.
Conclusion	<p>Any new property within or adjacent to the Flood Zones or unmapped watercourses should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.37 Dumha Thuama

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA pluvial
Historic Flooding	No historic records of flooding were found.
Comment	A field drain flows through the settlement in a southerly direction and outfalls into the Blacksod Bay. The stream is fluvial at this point, but becomes tidal downstream of the settlement.
Climate Change	As the stream is influenced by tidal flooding, it would be highly sensitive to impacts of climate change downstream of the settlement.
Conclusion	<p>Any new property within or adjacent to the field drain should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.38 Foxford


Hierarchy/Tier	Tier 3
Area for Further Assessment under CFRAM programme?	Yes
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM
Historic Flooding	Recurring flooding of roads and land in Foxford town during times of high flow in the River Moy. Land flooding in the callows near Derrygaury south of Foxford from the river Moy during particularly wet winters.
Comment	<p>Significant predicted flood extent is noted from the River Moy which flows in a northerly direction through Foxford town. The Foxford Stream also flows in a northerly direction to the east of the settlement.</p> <p>An area of pluvial flooding is predicted by the PFRA pluvial mapping which highlights a low lying area in the south of the settlement, risk here may be lower than mapped due to positive drainage connections.</p> <p>Regarding future CFRAM mitigation, the slow response of the River Moy means it is possible to develop a fluvial flood forecasting and warning system for Ballina and Foxford using local level gauges, however this is yet to be put in place and no structural relief works are planned.</p>
Climate Change	A review of CFRAM Flood Zone A and B outlines suggest a moderate increase in fluvial risk.
Conclusion	Any new property, or renovations/extensions within or adjacent to the Flood Zones should include a site specific FRA that uses the

CFRAM water levels as a basis for the management of flood risk. For undeveloped lands the sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. For further development within the area of predicted pluvial flood risk to the south of the development a detailed Stage 3 FRA would be required at development management stage.


Once the Flood Forecasting and Monitoring System is set up then this information should be used as part of a warning and preparedness approach for at risk property.

Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

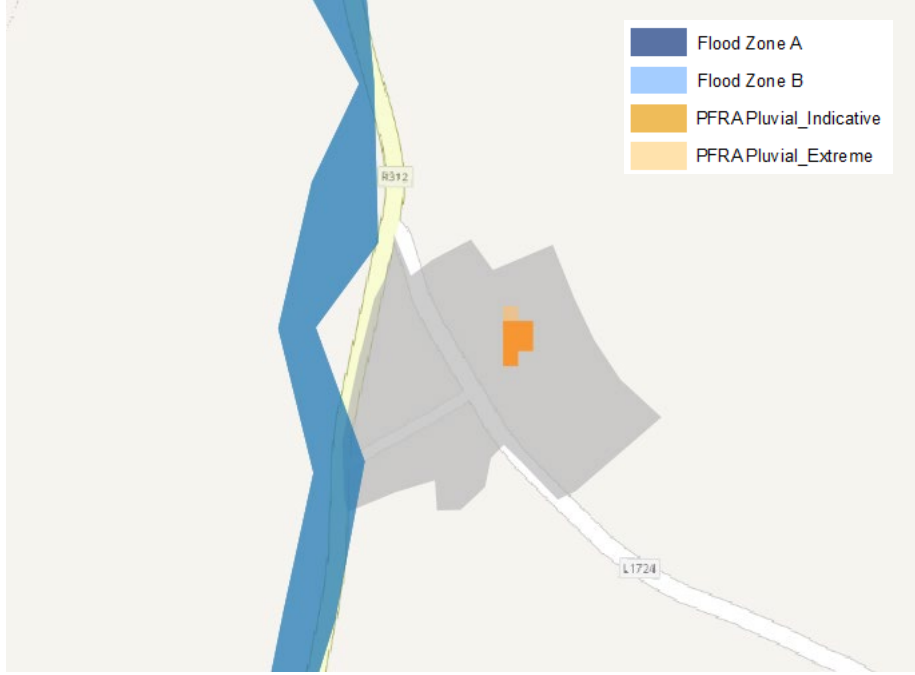
8.39 Glenamoy

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA, The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA pluvial
Historic Flooding	No historic records of flooding were found.
Comment	A river flows to the south of the settlement boundary but does not pose a significant risk.
Climate Change	Low sensitivity to climate change.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

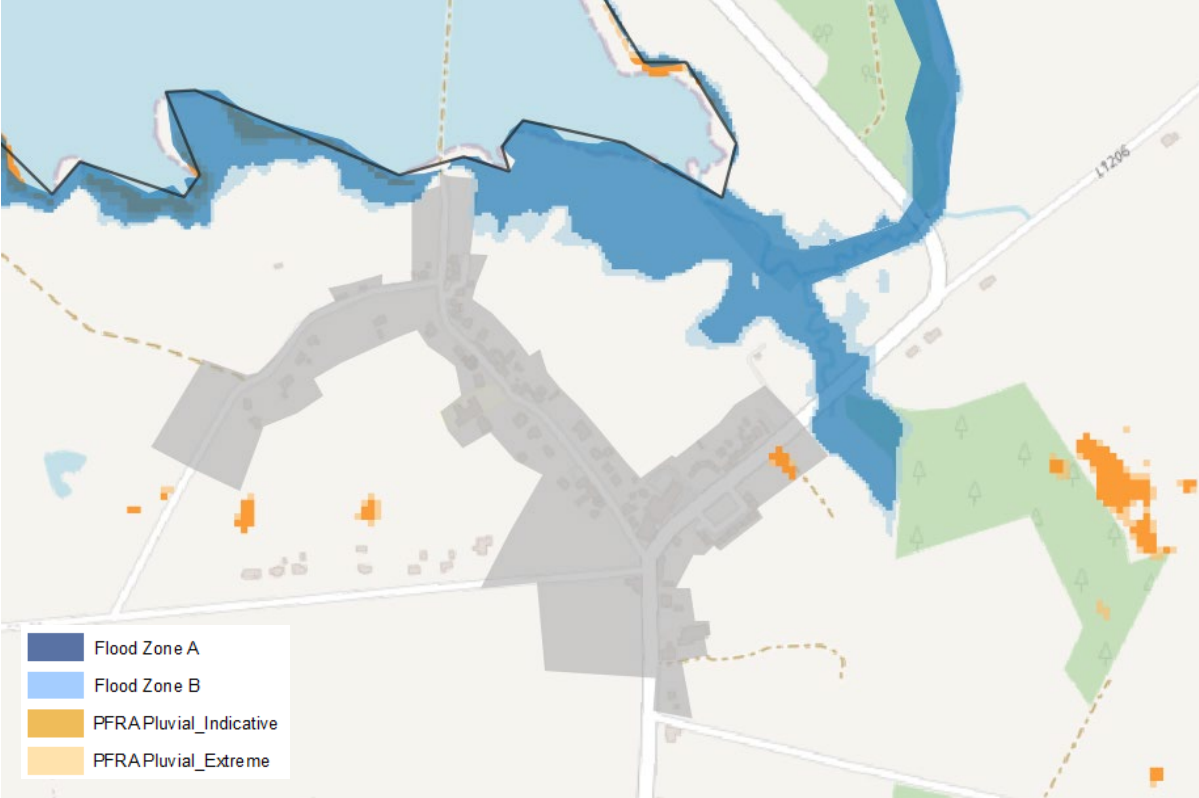
8.40 Glenhest

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	A small stream and its tributary flow in a southerly/southwesterly direction through the settlement. The main receptors are a school and residential development.
Climate Change	Moderate sensitivity to climate change.
Conclusion	<p>Any new property within or adjacent to the Flood Zones should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

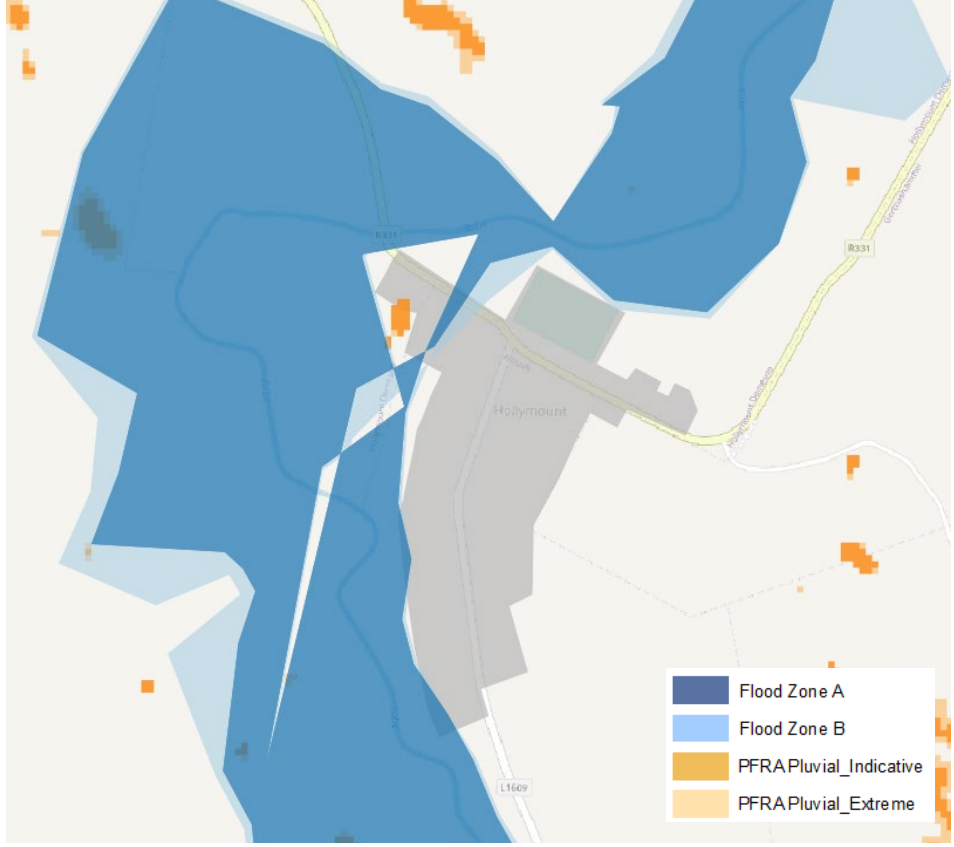
8.41 Glenisland

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	A small stream flows in a northerly direction through the settlement, the Flood Zones do not impact any highly vulnerable development.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	<p>Any new property within or adjacent to the Flood Zones or stream channel should include a site specific Stage 3 FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>


8.42 Gweesalia

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA/ICPSS
Historic Flooding	No historic records of flooding were found
Comment	A small stream and its tributaries flow in a northerly direction to the east of the site and outfalls into the Blacksod Bay. The streams are therefore influenced by both fluvial and tidal sources
Climate Change	The majority of the settlement is elevated above 10mOD and is therefore at low risk.
Conclusion	<p>Any new property within or adjacent to the Flood Zones should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>


8.43 Hollymount

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	Predicted flood extents noted from the Robe River (OPW Arterial Drainage channel), which flows through the settlement in a south easterly direction. Lands adjacent to the watercourses are impacted, however these are largely undeveloped. It is likely that the PFRA mapping through this settlement is overestimated given that the OPW Arterial Drainage scheme will have increased channel capacity.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	<p>Any new property within or adjacent to the Flood Zones should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

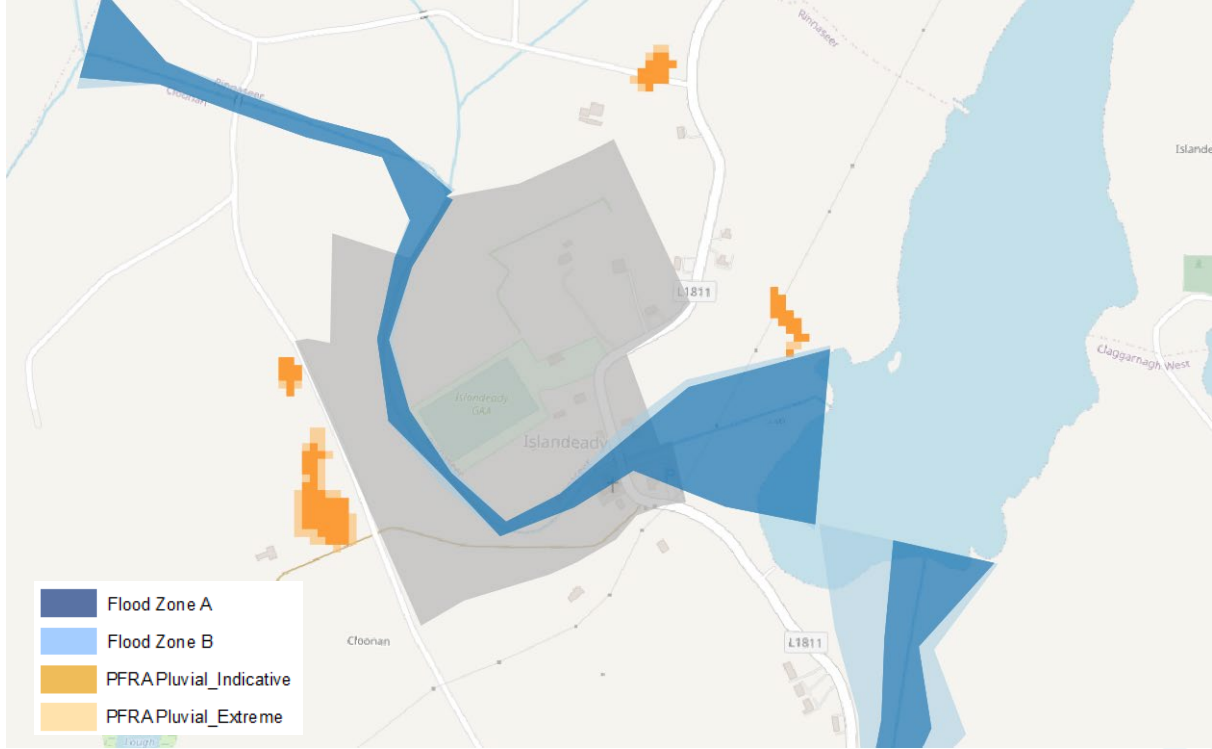
8.44 Inver

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA/ICPSS
Historic Flooding	No historic records of flooding were found.
Comment	Predicted flood extents noted from the An tInbhear River, which flows through the settlement in a westerly direction and outfalls into the Broadhaven Bay. The river is therefore influenced by both fluvial and tidal sources. Lands adjacent to the watercourse are impacted but these are green space/undeveloped.
Climate Change	Despite its coastal location, the settlement is elevated above 10mOD and is therefore at low risk.
Conclusion	<p>Any new property within or adjacent to the Flood Zones should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.45 Irishtown

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	Predicted flood extents noted from the Carrowlough River (OPW Arterial Drainage channel), which flows through the settlement in a south westerly direction. Lands adjacent to the watercourse are marginally impacted – the edge of a housing estate, however it is likely the PFRA outlines are overestimated in this area.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	Any new houses to the housing estate on the western fringe of the settlement should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

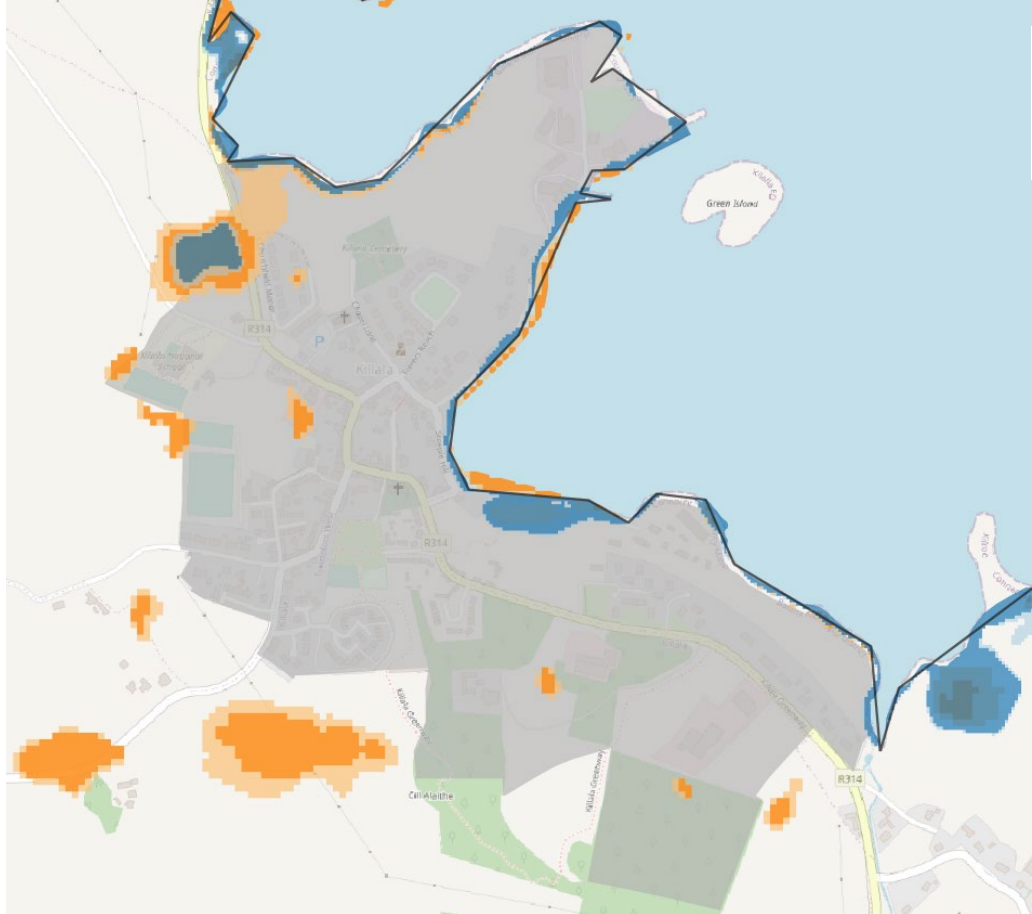
8.46 Islandeady

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	A small stream flows through the settlement in an easterly direction and into Islandeady Lough. Some existing development is within the PFRA outlines, however the watercourse in an OPW Arterial Drainage channel and extents are likely to be overestimated.
Climate Change	Moderate sensitivity to climate change.
Conclusion	<p>Any new property within or adjacent to the Flood Zones should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.47 Keel-Doogh

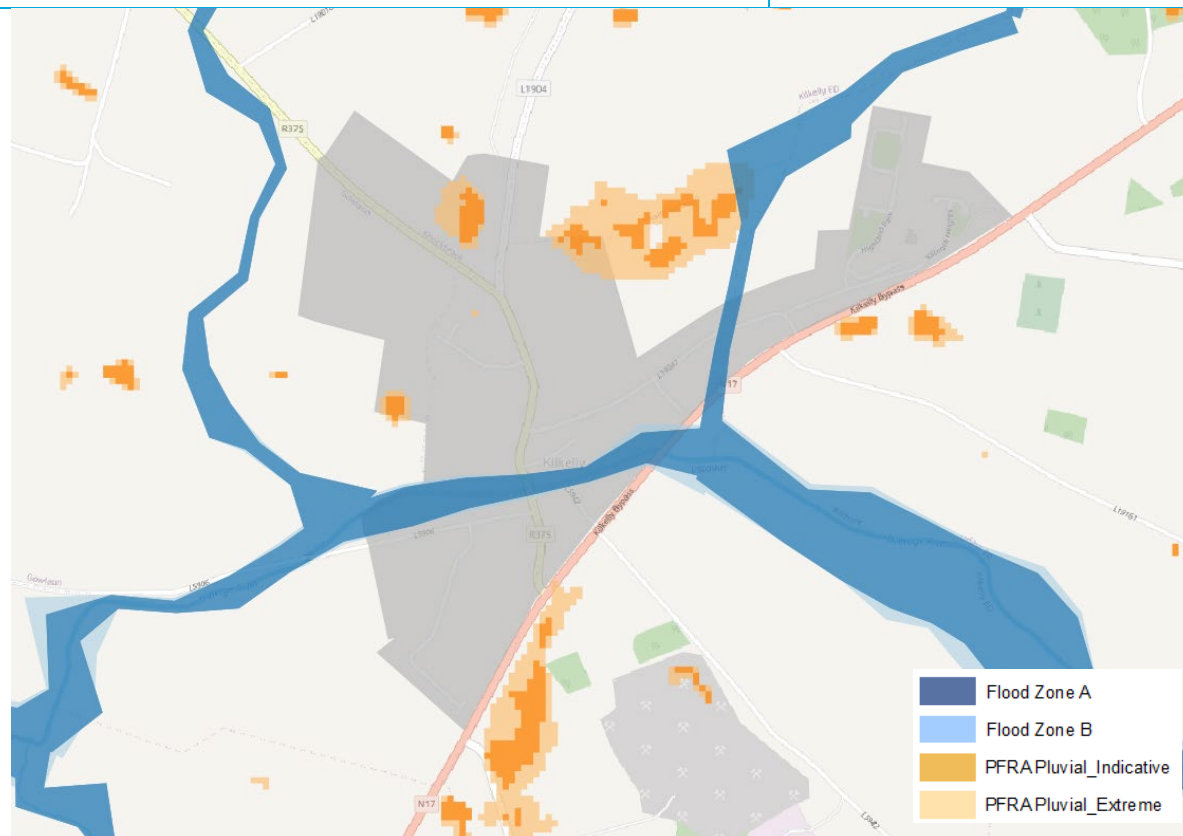
Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA/ICPSS
Historic Flooding	<p>Recurring flooding on Doogh Strand during high tides and strong winds.</p> <p>Recurring flooding of roads and lands as a result of a combination of storm sea state and high flows in the Tongree River after heavy rain. Event frequency is approximately 1 in 5 years.</p>
Comment	There are a number of small streams flowing through the settlement and outfall into the Atlantic Ocean. The streams are therefore influenced by both fluvial and tidal sources
Climate Change	The low-lying area of the settlement which is influenced by tidal flooding would be highly sensitive to the impacts of climate change.
Conclusion	<p>Any new development adjacent to a watercourse or adjacent/within Flood Zone A/B should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.48 Kilalla

Hierarchy/Tier	Tier 3
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA/ICPSS
Historic Flooding	Flooding has been noted in Kilalla in August 2019.
Comment	Flood risk is typically related to tidal impacts around the coastal northern fringe of the development. Away from the seafront the land gains elevation quickly. Some larger areas of pluvial risk are located in the west of the settlement where there is a possible seasonal lake/turlough.
Climate Change	The low-lying area of the settlement which is influenced by tidal flooding would be highly sensitive to the impacts of climate change.
Conclusion	<p>The tidal flood impacts are quite well defined and the sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. Any new development close to the tidal Flood Zones should undertake a site specific FRA and consider the potential impacts of climate change.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.49 Kilkelly

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No

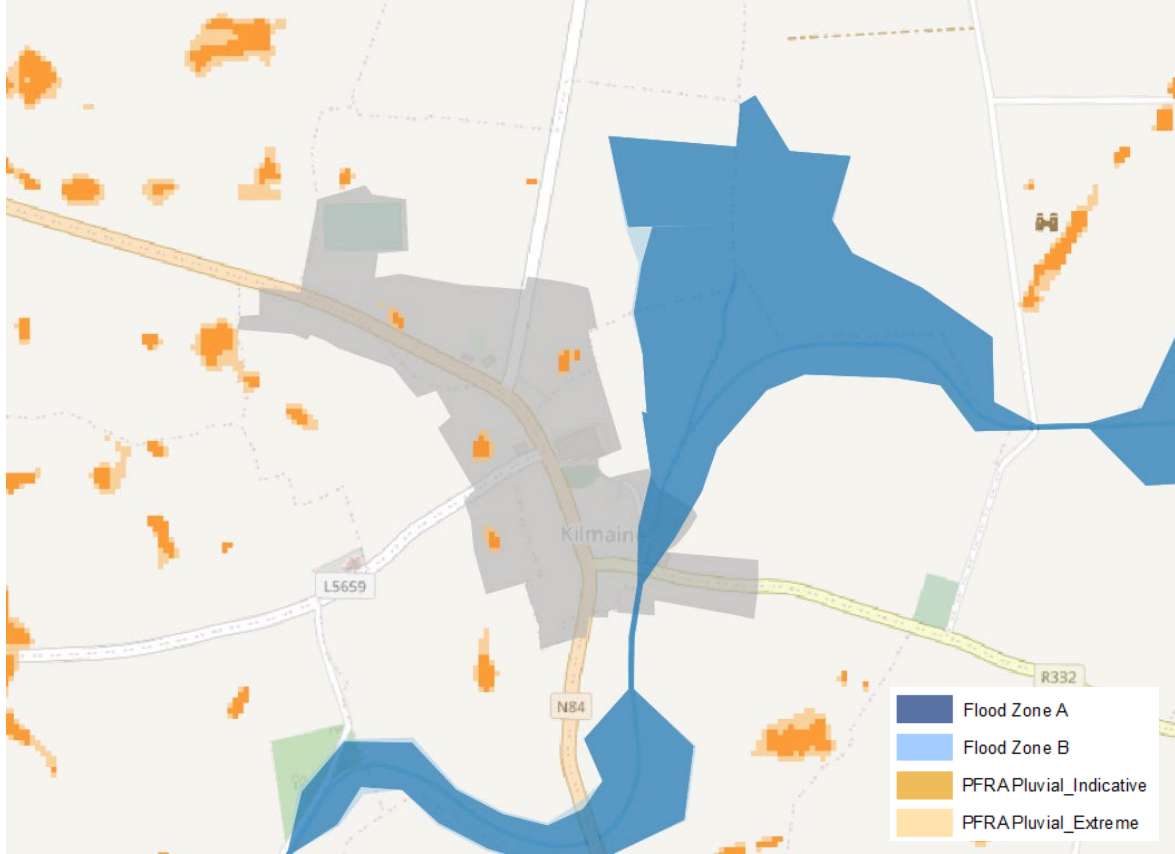


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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

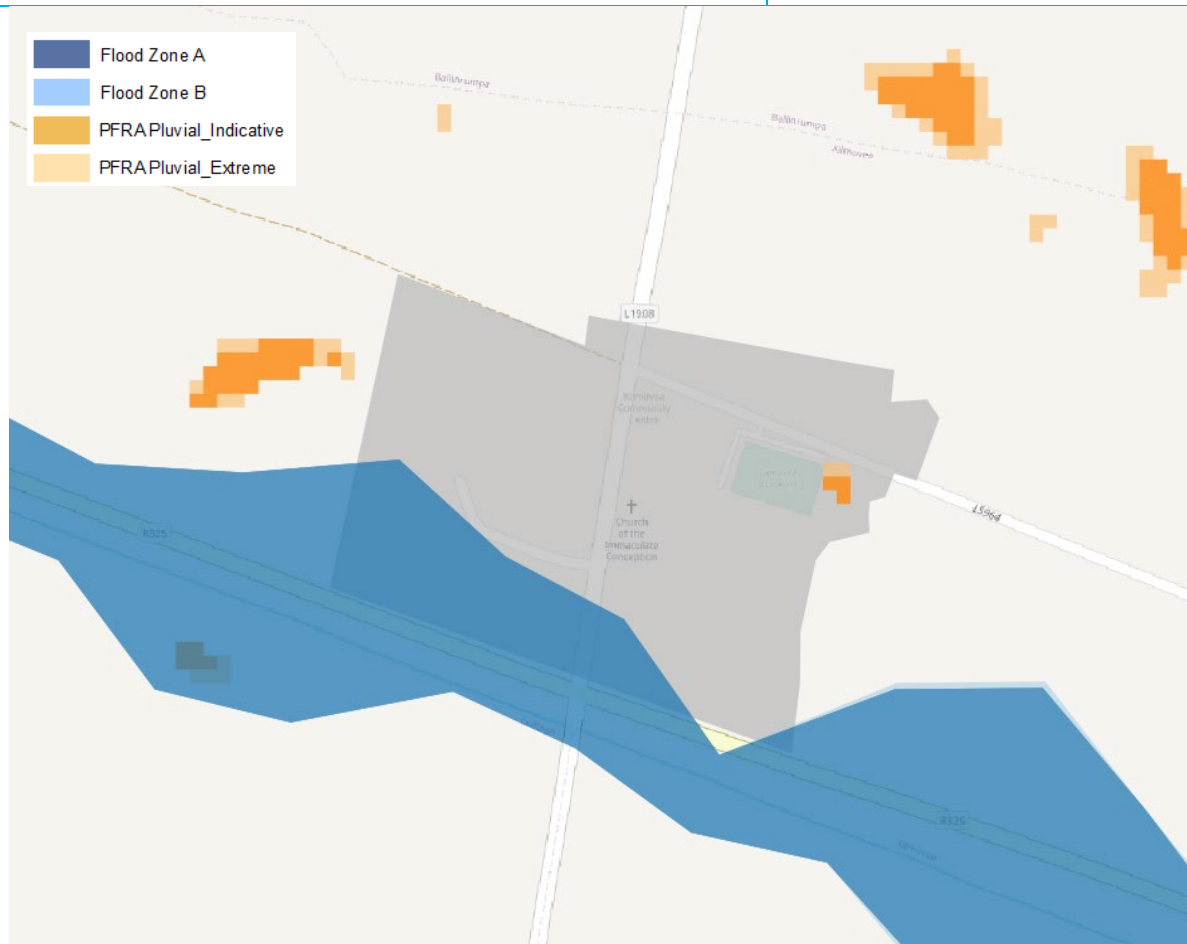
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Predicted flood extents noted from the Trimogue River (OPW Arterial Drainage channel), which flows through the settlement in a south westerly direction, and the Kilkelly Stream which flows through the settlement in a southerly direction into the Trimogue River. Lands adjacent to the watercourses are impacted and this includes some existing development, however the Trimogue channel is managed by OPW and the flood extents are likely to be overestimated.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	Any new development adjacent to the Trimogue River or other watercourses should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.50 Kilmaine

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM
Historic Flooding	No historic records of flooding were found.
Comment	Predicted flood extents noted from the Kilmaine River (OPW Arterial Drainage channel), which flows through the settlement in a southerly direction. Lands adjacent to the watercourses are impacted and this includes residential property and undeveloped lands. Due to the drainage scheme the PFRA mapping is most likely overestimating risk.
Climate Change	Low sensitivity to increase in flows.
Conclusion	<p>Any new development adjacent to the Kilmaine River should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.51 Kilmovee

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No

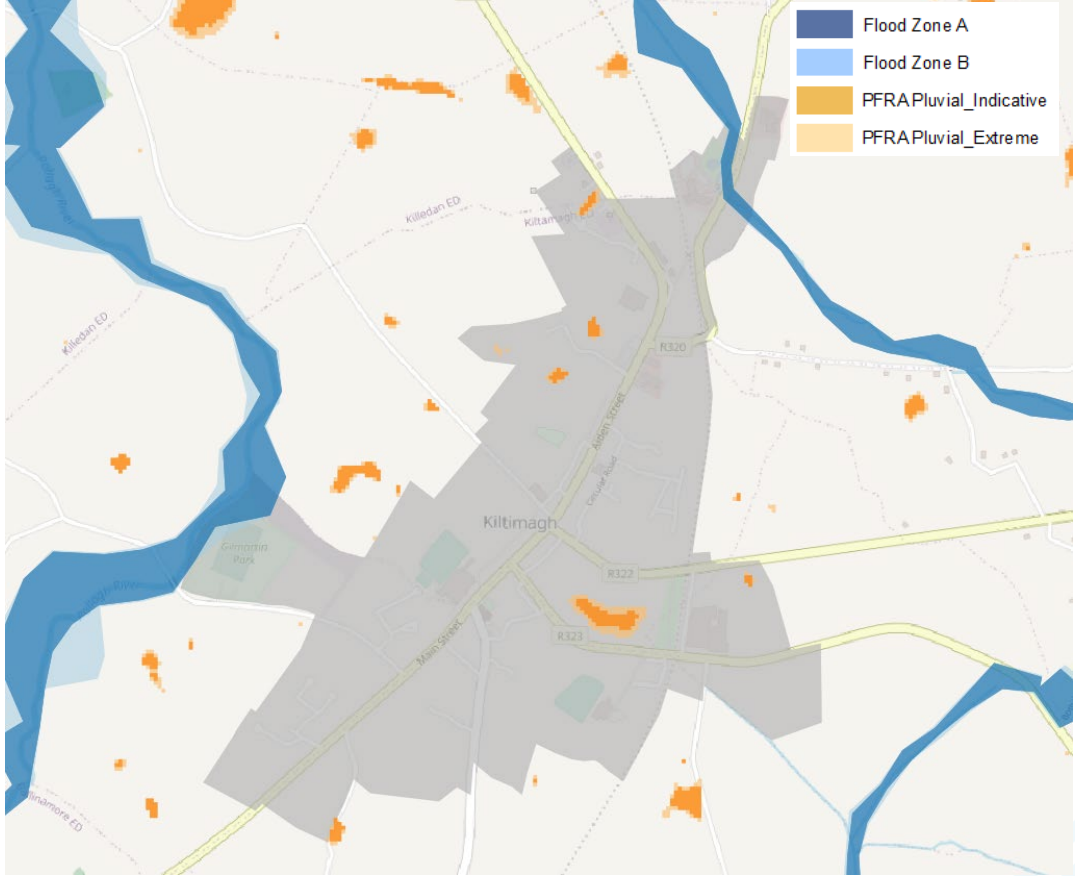


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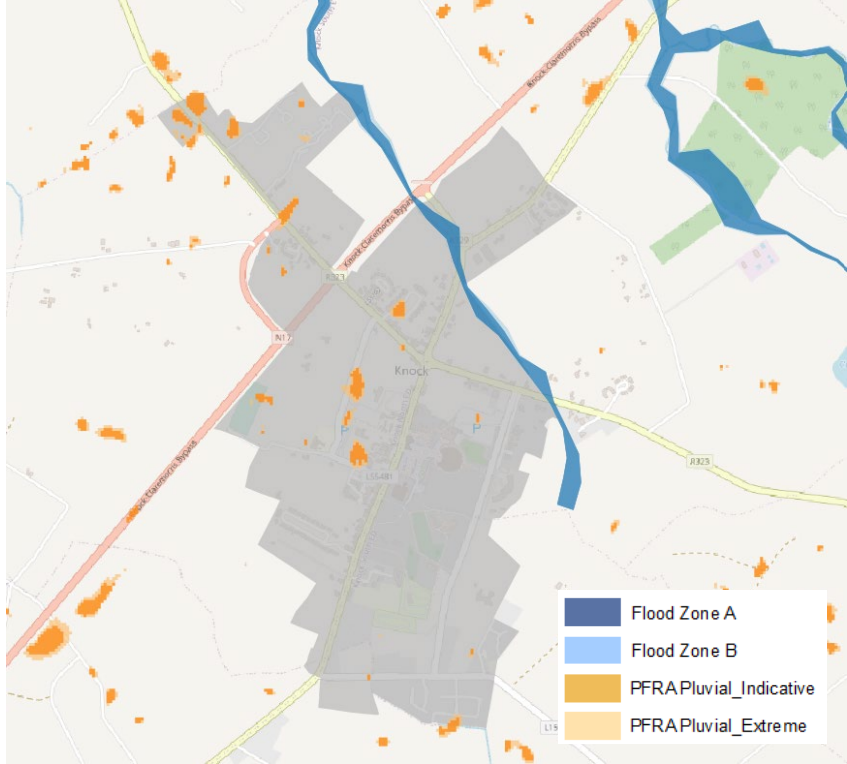
The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	An OPW Arterial Drainage channel flows to the south of the settlement and the predicted food risk extends within the site boundary. IT is likely that risk is overestimated by the PFRA.
Climate Change	No fluvial impacts, potential increase in runoff.
Conclusion	Any new property within or adjacent to the Flood Zones should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

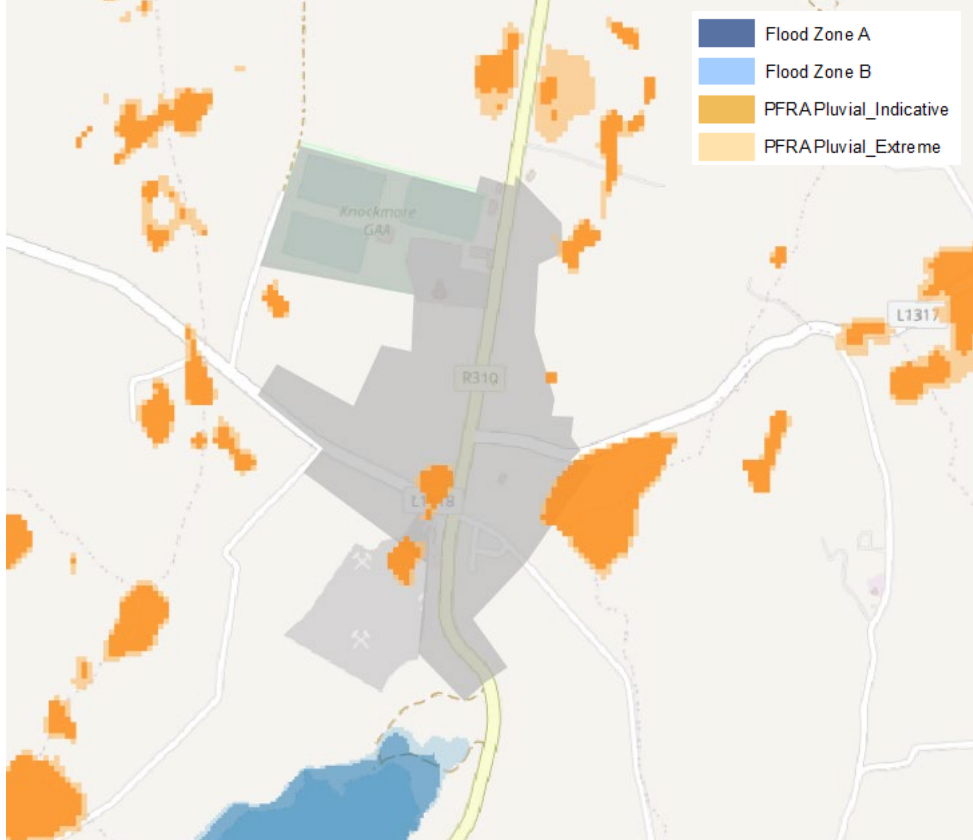
8.52 Kiltimagh

Hierarchy/Tier	Tier 3
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	Land flooding in Kiltimagh in vicinity of the GAA pitches from the river Pollagh overflowing its banks was recorded to have occurred in the past but is noted to not be a frequent event.
Comment	The River Pollagh does not pose a risk to the core settlement and the local watercourses are all OPW Arterial Drainage channels and as such risk is likely to be less than mapped. Some isolated areas of pluvial flood risk are predicted.
Climate Change	Moderate sensitivity.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.53 Knock

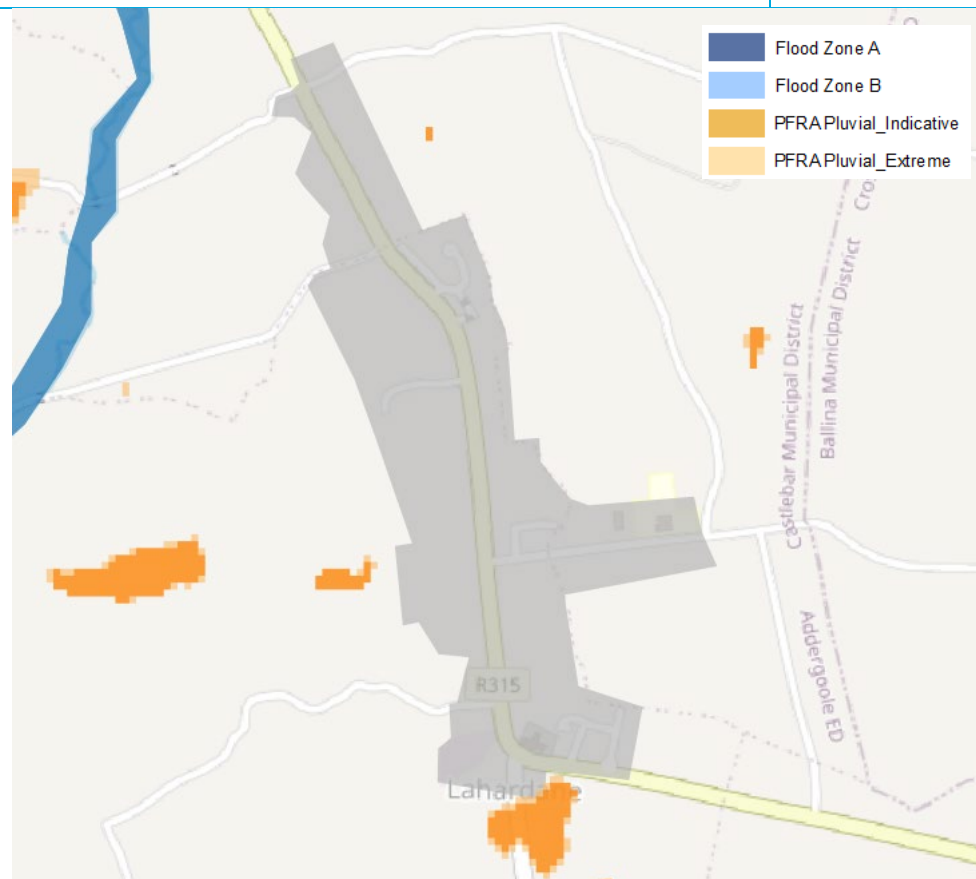
Hierarchy/Tier	Tier 3
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	None found
Comment	An OPW Drainage channel (C1/30) rises as a stream in the Knock Shrine parkland and then flows around the eastern periphery of the site before flowing under the N17 and adjacent to the eastern flank of the housing estate at Carrowmore. Houses are at low risk and raised above the floodplain. Further upstream the channel is deep and located in a small valley with limited risk to the settlement, the PFRA mapping is likely to be overestimated due to the increased channel capacity. There are some small spots of predicted pluvial flooding but nothing significant and no historic impacts noted.
Climate Change	Low to moderate sensitivity to increased flow.
Conclusion	Any new development adjacent to the OPW Drainage channel should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.54 Knockmore

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA pluvial, CFRAM (Lough Conn only)
Historic Flooding	No historic records of flooding were found
Comment	A small stream flows in a southerly direction into Lough Conn adjacent to the southern settlement boundary. The flood extents from Lough Conn are provided by the CFRAM, but they are not predicted to extend into the settlement boundary and no development is impacted, there is also no flood history. There is an area of predicted pluvial flooding to the east of the settlement and two areas adjacent to the R310.
Climate Change	Low sensitivity to increase in flows.
Conclusion	<p>Any new development in the southern fringe of the development should undertake a suitably detailed FRA to assess the risk from the stream flowing to the south. Surface water management should be a key consideration for new development within any areas of predicted pluvial flooding, and this should be detailed under an FRA at development management stage.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.55 Lahardane

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No

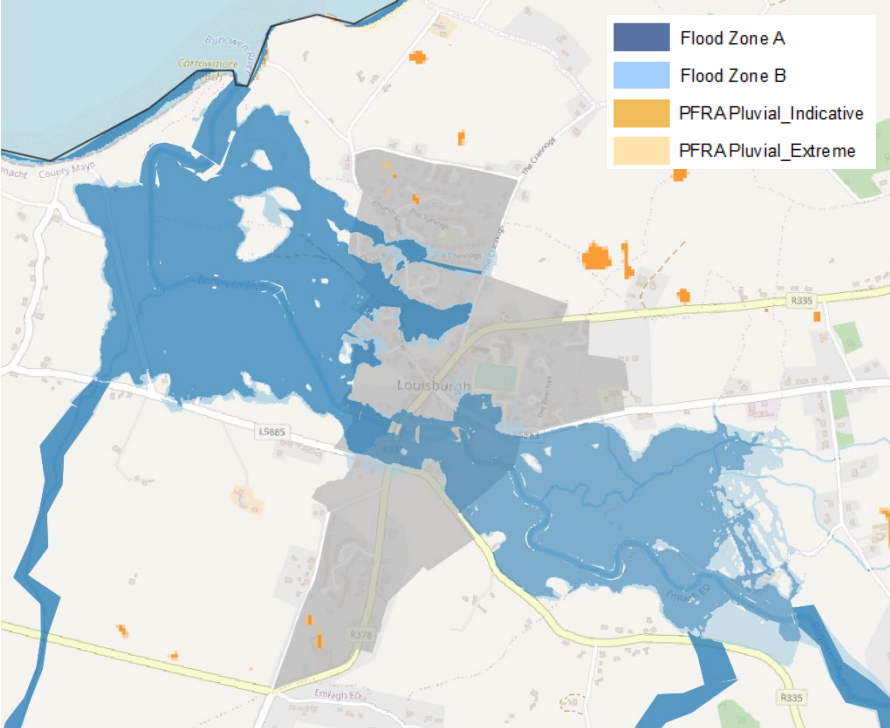


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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

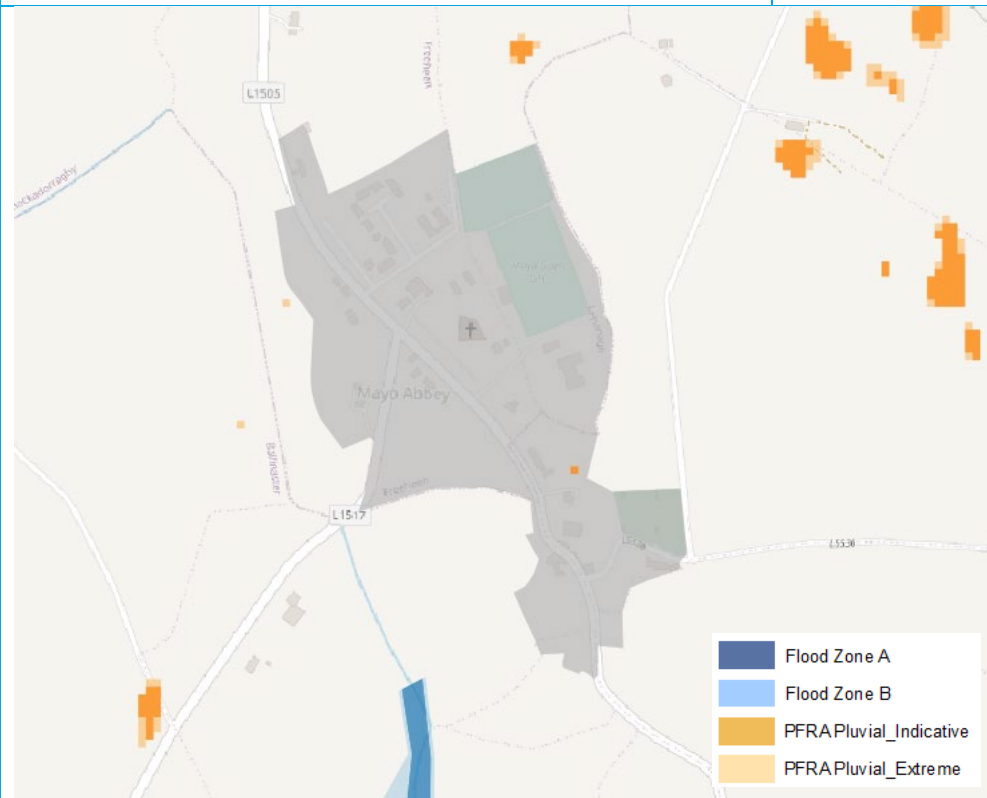
Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	The Caffoley River flows in an easterly direction south east of the settlement before converging with the Adergoole river, and the Lecarrow River flows in a northerly direction north west of the settlement, into the Castlehill River. The flood extents do not impact on the settlement and there are no records of flooding. An area of pluvial flooding is located south of the settlement boundary.
Climate Change	Low to moderate sensitivity to increase in fluvial flood risk.
Conclusion	Risk is generally low and can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.56 Louisburgh

Hierarchy/Tier	Tier 3
Area for Further Assessment under CFRAM programme?	Yes
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM
Historic Flooding	Local anecdotal evidence suggests flooding occurred in 1999 with Chapel Street flooding 3 times between September to December 1999. Severe flooding was reported in 1974, which caused flooding to several properties in the town centre. The WTP was also reported to have flooded in 1999, 2001 and 2006.
Comment	Flood risk extends to the central and northern area of the settlement. Risk is both tidal and fluvial. The CFRAM was not able to deliver a fully cost beneficial FRS for the settlement and the only measure currently progressing is a non-structural flood forecasting and warning system for Clew Bay, which is yet to be put in place.
Climate Change	High sensitivity to fluvial and tidal climate change impacts.
Conclusion	<p>It is essential that there is no new development permitted within Flood Zone A/B and that space is kept for the impacts of climate change and potential future structural flood relief works which would involve walls and embankments through the centre of the settlement.</p> <p>An FRA is required for any new development adjacent to the Flood Zones and this must include consideration of climate change impacts.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.57 Mayo Abbey

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No



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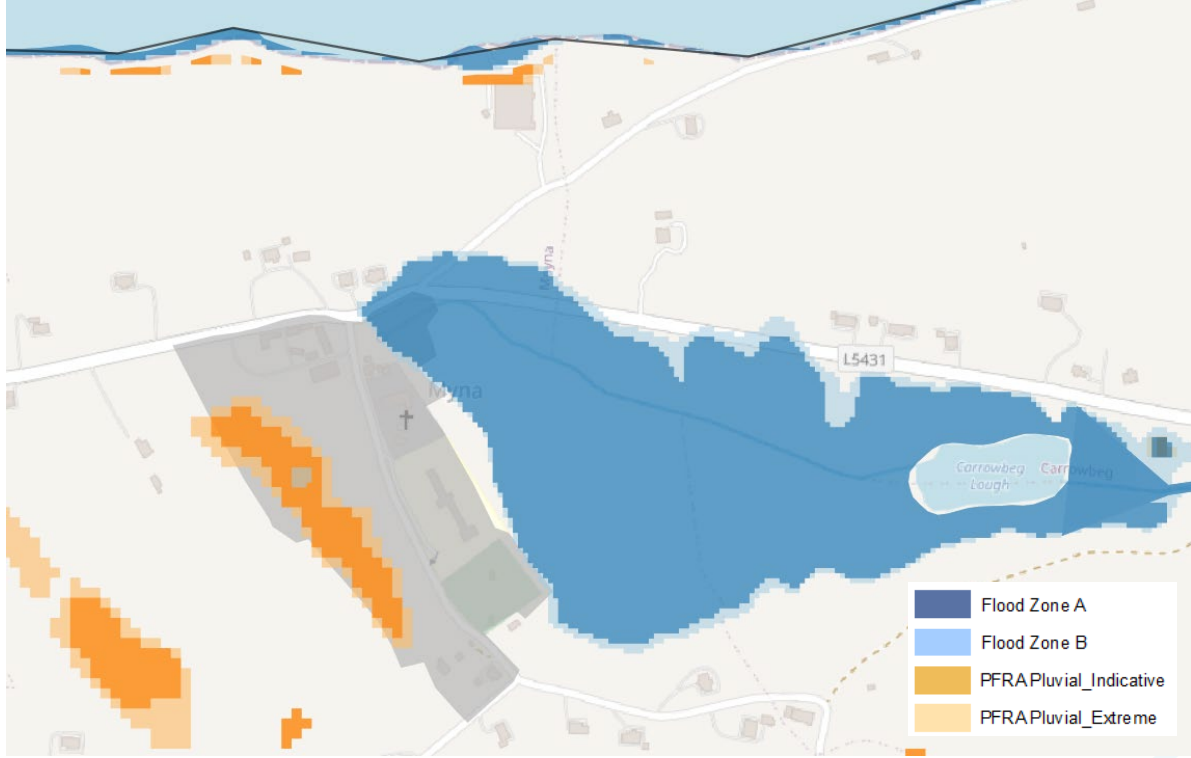
The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	The Lehanagh River flows in a southerly direction and is located to the west of the settlement boundary, it flows into the Meander River. The settlement is raised significantly above the floodplain of the river and is at low risk.
Climate Change	Low sensitivity to increase in flows.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

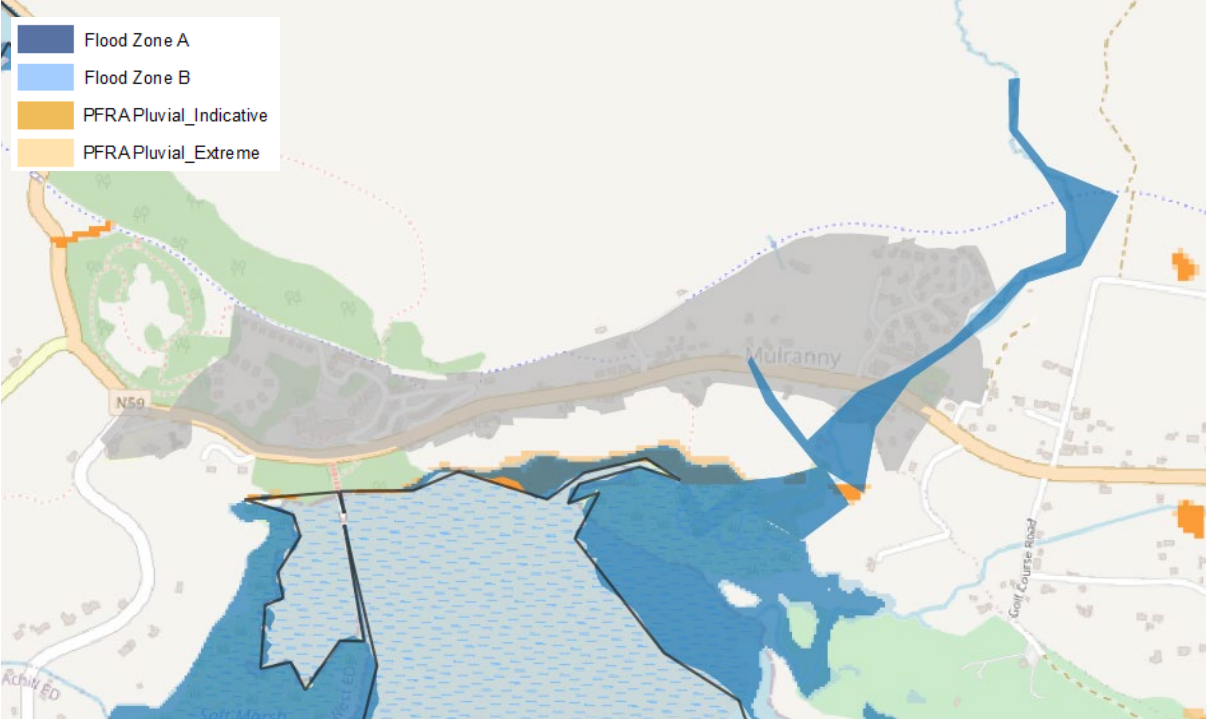
8.58 Moygownagh

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM
Historic Flooding	No historic records of flooding were found.
Comment	Predicted flood extents noted from the Cloonaghmore River, which flows through the settlement in a north easterly direction. Lands adjacent to the watercourses are impacted and this is predominantly undeveloped land.
Climate Change	Low sensitivity to increase in flows.
Conclusion	<p>Any new development adjacent to the OPW Drainage channel should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.59 Moyne (Kilmeena)

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA/ICPSS
Historic Flooding	No historic records of flooding were found
Comment	Predicted flood extents noted from Carrowbeg Lough that extend back towards the eastern fringe of the settlement. The risk is likely to be related to tidal impacts, or long periods of high rainfall. Low lying lands to the west of the settlement are predicted to be impacted by pluvial flooding.
Climate Change	High sensitivity to tidal impacts.
Conclusion	<p>Any new development should avoid areas identified as being within a Flood Zone or impacted by pluvial flooding and if adjacent to the flood mapping, should include a suitably detailed FRA. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

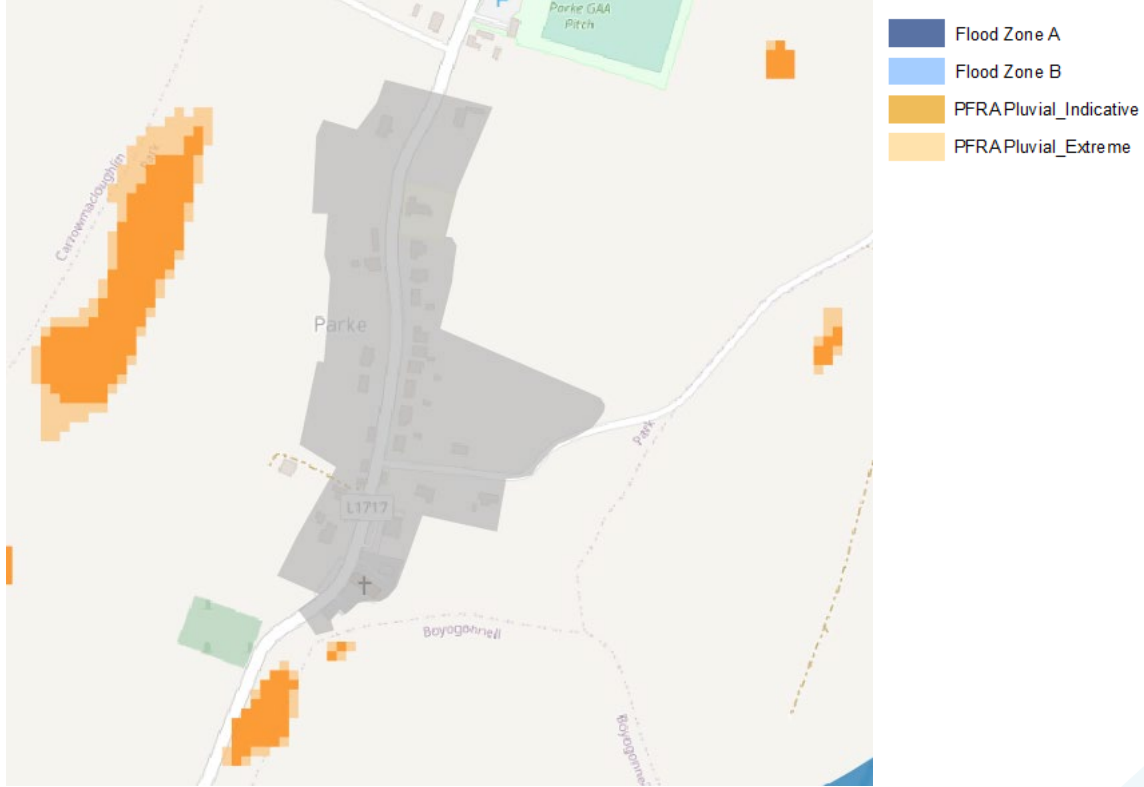
8.60 Mulranny

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA, The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA/ICPSS
Historic Flooding	Recurring flooding has been recorded on roads, lands, and property on the N59 east of the Mulranny settlement during periods of heavy rain when runoff from high ground cannot discharge into the gully system because it is blocked by debris washed down from high ground.
Comment	There are two small streams that flow in a southerly direction through the settlement and outfall into Clew Bay. Risk from the streams is limited, however the potential for culvert blockage would present a significant residual risk. The settlement is raised significantly above sea level and coastal flood risk is low.
Climate Change	The main settlement is not sensitive to sea level rise as inland levels are typically above 10mOD Malin. Moderate risk from fluvial flooding.
Conclusion	Any new development adjacent to or within a Flood Zone should undertake an appropriately detailed FRA which must include a residual risk analysis for culvert blockage. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.61 Newport

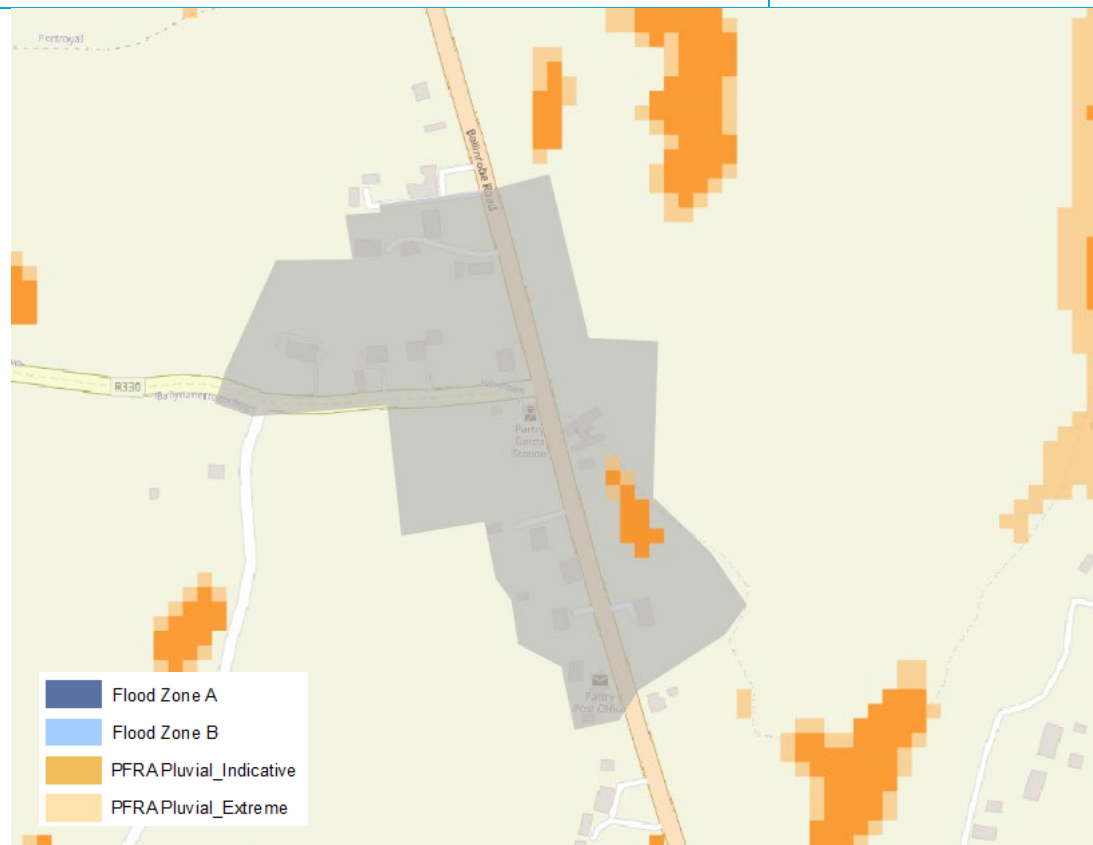
Hierarchy/Tier	Tier 3
Area for Further Assessment under CFRAM programme?	Yes
<p>© OpenStreetMap contributors, CC-BY-SA,</p>	
<p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM
Historic Flooding	Recurring flooding is recorded on the N59 (to the north), Quays road, and the R311 (east of the N59).
Comment	The Newport River flows in a westerly direction through the settlement and is tidally influenced. It presents limited risk to existing development. Another watercourse flows parallel to the Newport River in a westerly direction, it impacts some existing development in the 0.1% AEP (Flood Zone B). The CFRAM was unable to deliver a cost beneficial scheme for Newport and a coastal flood forecasting system for Clew Bay will provide advance notice of potential tidal flooding in Newport.
Climate Change	The low-lying area of the settlement which is influenced by tidal flooding would be highly sensitive to the impacts of climate change
Conclusion	<p>It is essential that there is no new development permitted within Flood Zone A/B and that space is kept for the impacts of climate change.</p> <p>An FRA is required for any new development adjacent to the Flood Zones and this must include consideration of climate change impacts.</p> <p>Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.</p>

8.62 Parke

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA pluvial
Historic Flooding	No historic records of flooding were found.
Comment	A river flows to the south of the settlement boundary but does not pose a significant risk.
Climate Change	Low sensitivity to climate change.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.63 Partry

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No



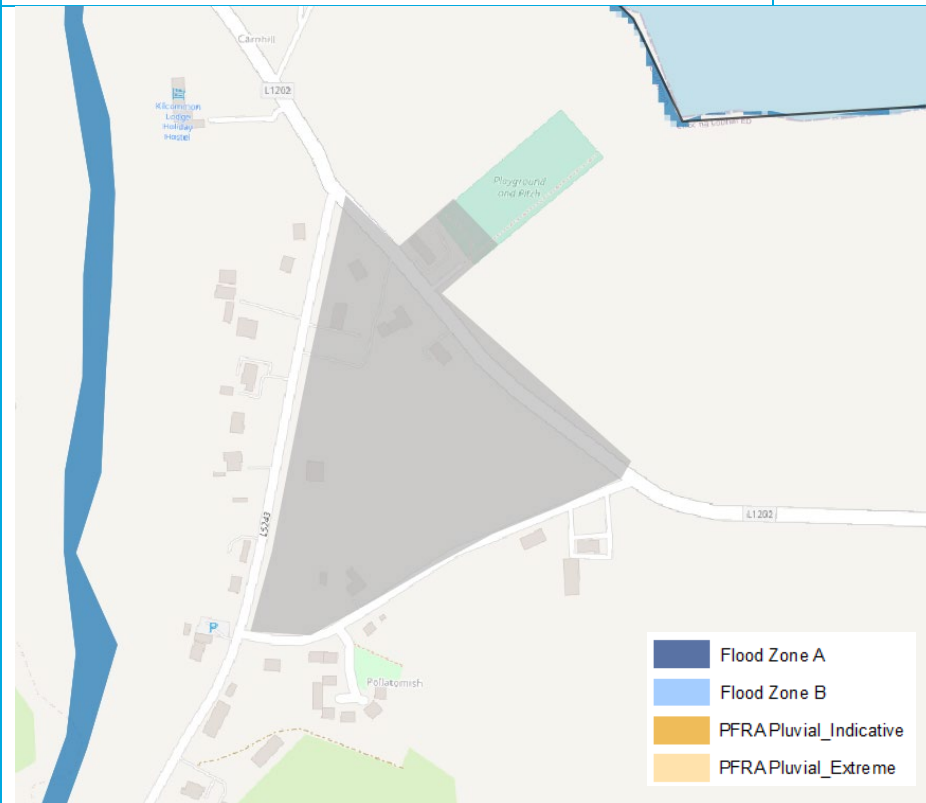
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The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA pluvial
Historic Flooding	No historic records of flooding were found.
Comment	A small area of pluvial flood risk is located within the settlement.
Climate Change	Low sensitivity to climate change.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA. .

8.64 Pollatomish

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No



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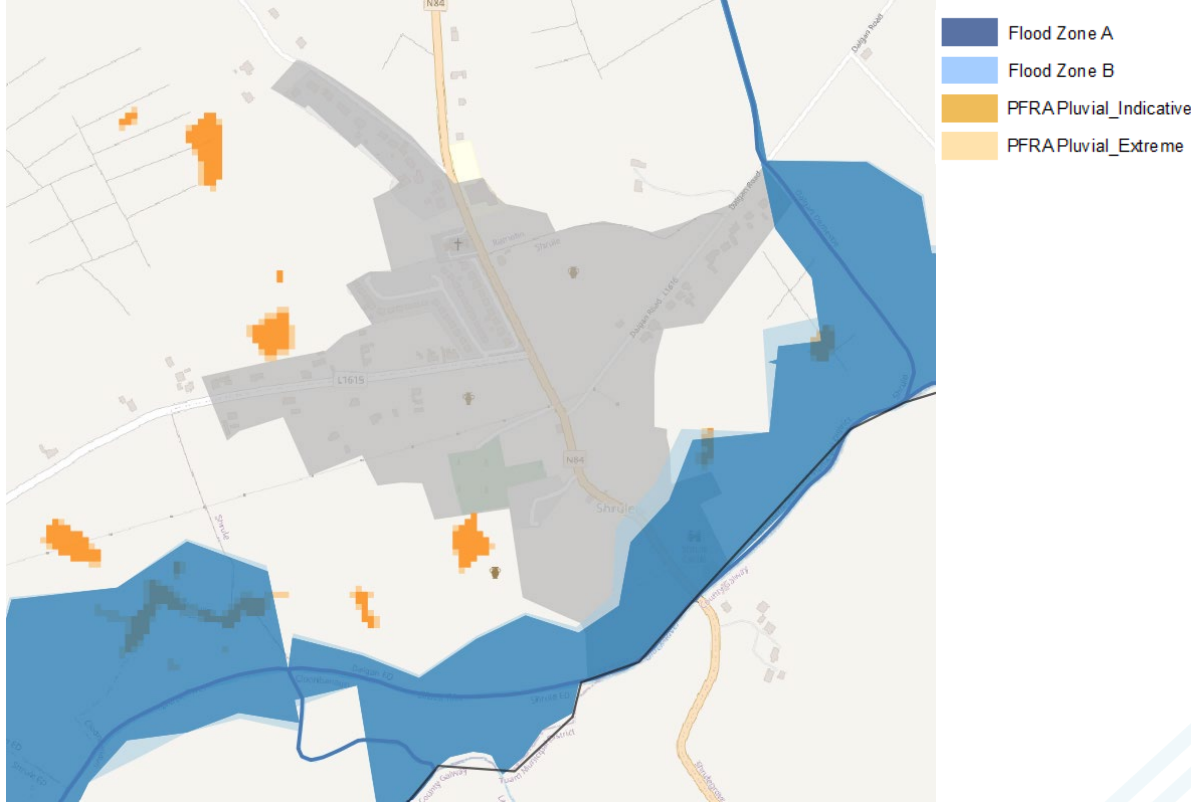
The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.

Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found.
Comment	A watercourse flows to the west of the settlement but does not pose a risk.
Climate Change	Low sensitivity to climate change.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA. .

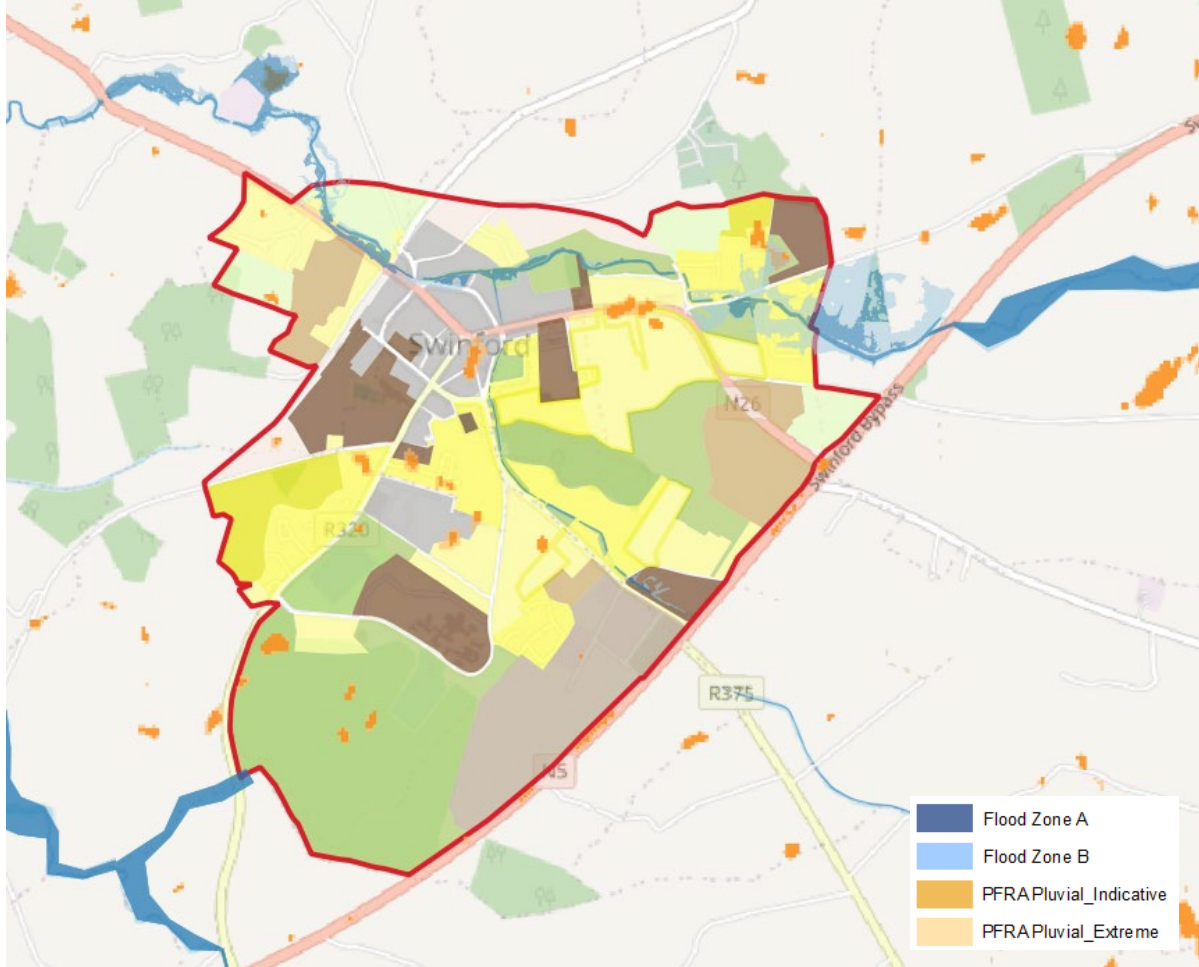
8.65 Roundfort

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA pluvial
Historic Flooding	No historic records of flooding were found
Comment	The Rathmalikeen Stream flows in a northerly direction to the west of the settlement into the Robe River, it does not impact the settlement. Isolated areas of potential pluvial flooding are located in the north and south of the settlement.
Climate Change	Low to moderate sensitivity to increase in flows.
Conclusion	Care should be given to potential pluvial risk and this should be assessed as part of an appropriately detailed FRA for any development within the associated pluvial flood outline. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.66 Shrule

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
	
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA
Historic Flooding	Flood event on the Corrib downstream of Shrule on November 29 th 1999.
Comment	Predicted flood extents noted from the Black River, which flows through the settlement in a south westerly direction and the Mocarha River which flows in a southerly direction through the settlement into the Black River. Lands adjacent to the watercourses are impacted and this includes existing development. The river is subject to an OPW Arterial Drainage scheme and it is likely that flood extents are overestimated.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	Any new development adjacent to the Black River and its Flood Zones should include a site specific FRA that specifically quantifies the water levels and risk. The sequential approach should be applied, and Flood Zone A/B preferentially avoided for any highly or less vulnerable development. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.67 Swinford

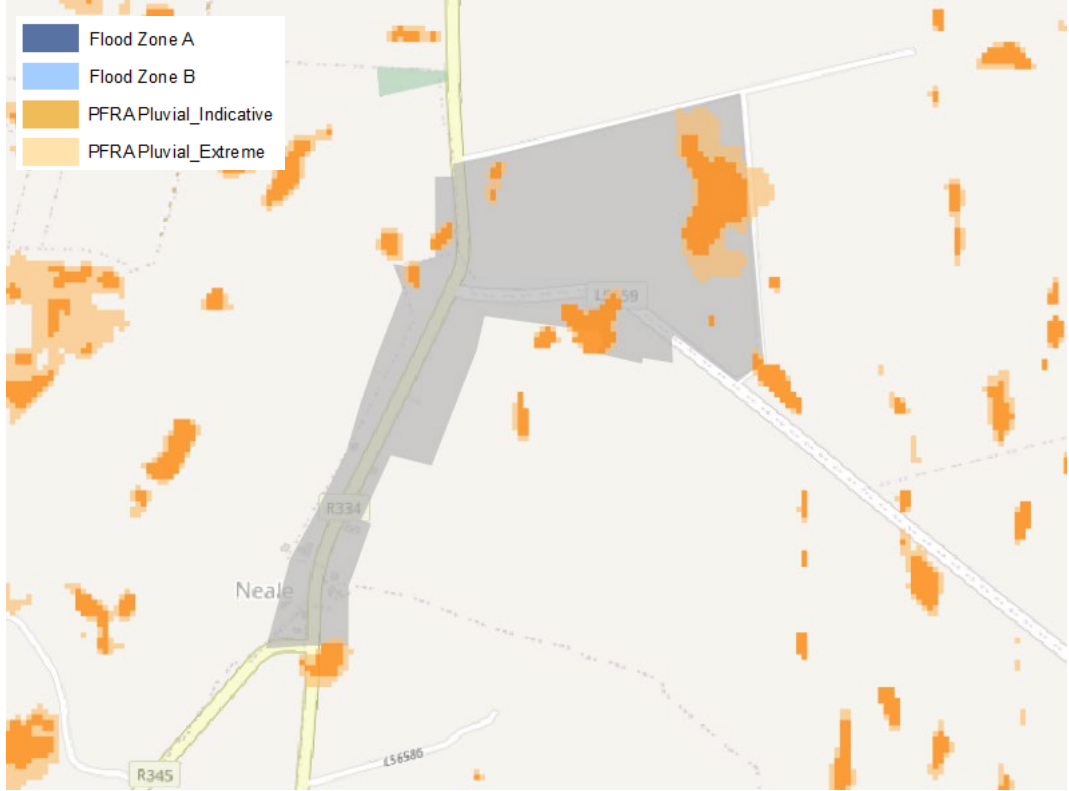
Hierarchy/Tier	Tier 2
Area for Further Assessment under CFRAM programme?	Yes
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM
Historic Flooding	Flooding was recorded in Swinford in December 1999, December 2015 during Storm Desmond, and August 2019.
Comment	<p>Some existing property is at risk from fluvial flooding, this is predominantly residential, undeveloped community services land to the east of the settlement have some encroachment of Flood Zone B, however the land is subject to an extant planning permission that undertook a Flood Risk Assessment.</p> <p>The CFRAM was unable to deliver a cost beneficial structural flood relief scheme for Swinford at present. A cost beneficial non-structural flood warning system is proposed, but this is yet to be set up.</p>
Climate Change	Moderate to high sensitivity to climate change.
Conclusion	It is essential that there is no new development permitted within Flood Zone A/B and that space is kept for the impacts of climate

change and potential future structural flood relief works which would involve walls and embankments around the properties along Brookville and an interception chamber on Railway Terrace.

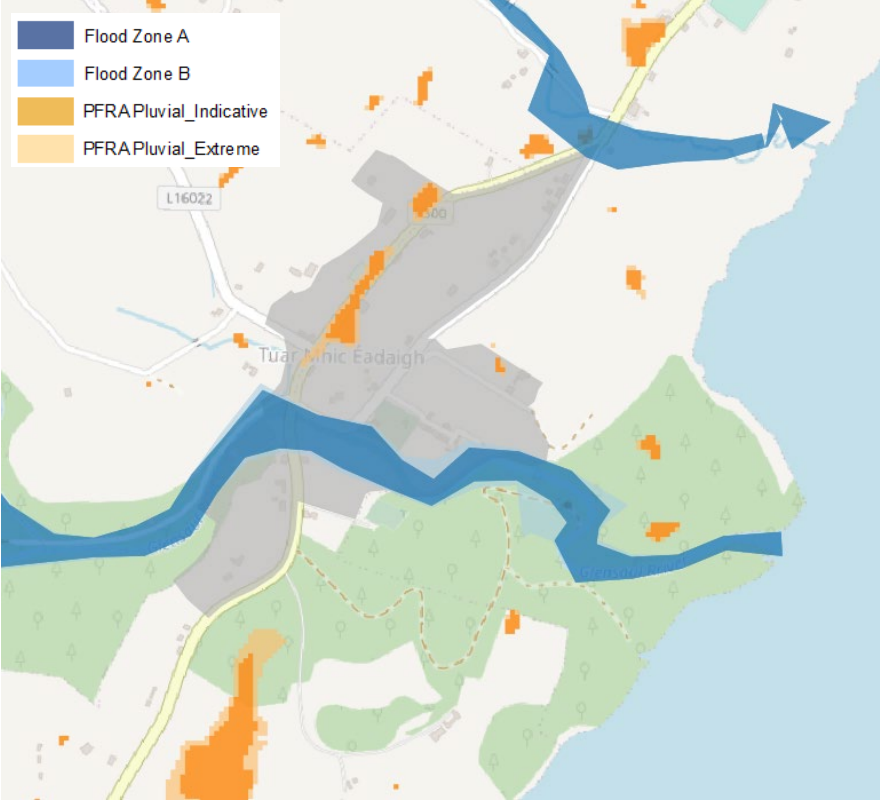
An FRA is required for any new development adjacent to the Flood Zones and this must include consideration of climate change impacts and residual risk of culvert blockage, as appropriate.

Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.68 The Neale

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
 <p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	PFRA pluvial
Historic Flooding	No historic records of flooding were found.
Comment	No significant fluvial flood risk identified. Isolated areas (low spots) are predicted to accumulate pluvial ponding.
Climate Change	No fluvial impacts, potential increase in runoff.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.69 Tourmakeady

Hierarchy/Tier	Tier 5
Area for Further Assessment under CFRAM programme?	No
	
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Flood Zone Data	PFRA
Historic Flooding	No historic records of flooding were found
Comment	Predicted flood extents noted from the Glensaul River, which flows through the centre of the settlement in an easterly direction into Lough Mask. Lands adjacent to the watercourses are impacted and this includes a small amount of existing development as well as undeveloped land. Another stream flows in an easterly direction at the very northern end of the settlement, there is no impact on existing development. Outlines are indicative and likely to overestimate, the Glensaul River is likely contained within a steep sided valley.
Climate Change	Moderate sensitivity to increase in flows.
Conclusion	An FRA is required for any new development adjacent to the Flood Zones and this must include consideration of climate change impacts and residual risk of culvert blockage, as appropriate. The sequential approach should be applied. It is noted that the Flood Zone mapping is indicative and further detailed modelling under a Stage 3 FRA would improve the quality and reliability of the assessment. Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

8.70 Turlough

Hierarchy/Tier	Tier 4
Area for Further Assessment under CFRAM programme?	No
<p>© OpenStreetMap contributors, CC-BY-SA,</p> <p>The flood mapping has been produced in accordance with the Planning Guidelines and therefore ignores the impact of flood protection structures. Areas protected by flood defences still carry a residual risk of flooding due to overtopping or breach, there may also be no guarantee of maintenance in perpetuity. Areas that benefit from defences are annotated separately.</p>	
Flood Zone Data	CFRAM
Historic Flooding	No historic records of flooding were found.
Comment	The Castlebar River flows just south of the settlement boundary, some predicted flooding, but this is located outside of the boundary.
Climate Change	Low sensitivity to increase in fluvial risk.
Conclusion	Risk can be managed in line with approved MCDP Policy in Chapter 7 of the Written Statement and the guidance provided within Section 7 of this SFRA.

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