

Leitrim County Development Plan

2015 – 2021

Strategic Flood Risk Assessment



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Leitrim County Council**

Strategic Flood Risk Assessment 2015-2021

Appendix A to the Environmental Report on the Strategic
Environmental Assessment of the Leitrim County
Development Plan 2015-2021

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STRATEGIC FLOOD RISK ASSESSMENT 2015-2021

1. *Introduction*

The *Planning System and Flood Risk Management – Guidelines for Planning Authorities*¹ were published in November 2009. These Guidelines were issued under Section 28 of the *Planning and Development Act 2000 as amended*, and require Planning Authorities to introduce flood risk assessment as an integral and leading element of their development planning functions. This is achieved by ensuring that the various steps in the process of making a development plan, together with the associated Strategic Environmental Assessment (SEA) are supported by an appropriate Strategic Flood Risk Assessment (SFRA).

This SFRA forms Appendix A to the Environmental Report for the *Leitrim County Development Plan 2015 – 2021* (DCDP) and should be read in conjunction with that Environmental Report.

The purpose of this SFRA is to support the Strategic Environmental Assessment (SEA) of the plan, and in this way inform the policies and objectives of the plan. A separate SEA, and SFRA for Carrick-on-Shannon, will be carried out upon review of the *Carrick-on-Shannon Local Area Plan 2010 - 2016*.

1.1 *Flood Risk Management*

The formulation of the policies and objectives in respect to the management of areas at risk of flooding must have regard to the document issued by the Minister entitled; *The Planning System and Flood Risk Management- Guidelines for Planning Authorities* (hereafter referred to as the '*Flooding Guidelines*').

The guidelines require the planning system at national, regional and local levels to: -

1. Avoid development in areas at risk of flooding, particularly floodplains, unless there are proven wider sustainability grounds that justify appropriate development and where the risk can be reduced or managed to an acceptable level without increasing flood risk elsewhere;
2. Adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and mitigation of flood risk; and
3. Incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

In terms of existing undeveloped zoned areas that are potentially at risk of flooding, the guidelines indicate that zoning policies and objectives should be reconsidered for any such lands where flood risk is assessed to be potentially significant and likely to increase in the future. Emphasis is placed on inter-alia; removing high risk/vulnerable uses, revisions to the land use zoning area/objectives for such areas, preparing a detailed local area plan informed by more detailed flood risk assessment addressing development issues prior to development; specification of pre-requisite flood risk measures.

¹ Accessible at www.environ.ie (Department of Environment, Community & Local Government).

1.2 *County Development Plan*

As set out in the Environmental Report, Leitrim County Development Plan (hereafter the '*Plan*'), the area to which the Plan relates is the administrative area of County Leitrim. A separate Local Area Plan will be prepared for the county town of Carrick-on-Shannon. The Council intends to prepare plans for other towns and villages in the County over the period of this plan. The Plan is strategic in nature, and sets out broad strategies, including a settlement strategy, on a County-wide basis.

The Plan includes a development framework for a total of 28 settlements with zoning maps for 27 settlement; Tier 2: -Ballinamore, Kinlough, Drumshanbo, Mohill and Manorhamilton, Tier 3: - Carrigallen, Dromahair, Dromod, Drumkeeran, Leitrim and Tullaghan, Tier 4: -Ballinaglera, Cloone, Dowra, Drumcong, Drumsna, Fenagh, Glenfarne [Parts 1, 2 & 3], Jamestown, Keshcarrigan, Kilclare, Killarga, Kiltyclogher, Lurganboy, Newtowngore and Roosky.

Carrick on Shannon is designated in the Plan as a Tier 1 Centre and is covered by a Local Area Plan 2010 – 2016. This Local Area Plan for the Carrick-on-Shannon is scheduled for review on a rolling six-year basis over the life of the Plan.

1.2.1 **Disclaimer**

It is important to note that compliance with the requirements of *The Planning System and Flood Risk Management – Guidelines for Planning Authorities* and the EU Floods' Directive² is a work in progress and is currently based on emerging and incomplete data, as well as estimates of the locations and likelihood of flooding. In particular, the assessment and mapping of areas of flood risk awaits the publication of the *Catchment-based Flood Risk Assessment and Management Plans* (CFRAMs). As a result, this Strategic Flood Risk Assessment for County Leitrim is based on available information.

Accordingly, all information in relation to flood risk is provided for general policy guidance only. It may be substantially altered in light of future data and analysis. As a result, all landowners and developers are advised that Leitrim County Council and its agents cannot accept responsibility for losses or damages arising due to assessments of the vulnerability to flooding of lands, uses and developments. Owners, users and developers are advised to take all reasonable measures to assess the vulnerability to flooding of lands in which they have an interest prior to making planning or development decisions.

1.3 *Flood Risk Assessments*

1.3.1 **Structure of a Flood Risk Assessment**

The Guidelines recommend that a staged approach is adopted when undertaking a Flood Risk Assessment (FRA). The recommended stages are briefly described below: -

- **Stage 1 – Flood Risk Identification**

To identify whether there may be any flooding or surface water management issues that will require further investigation. This stage mainly comprises a comprehensive desk study of available information to establish whether a flood risk issue exists or whether one may exist in the future.

² Directive 2007/ 60/ EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risk: Official Journal L288/ 27-34.

- **Stage 2 - Initial Flood Risk Assessment**

If a flood risk issue is deemed to exist arising from the Stage 1 Flood Risk Identification process, the assessment proceeds to Stage 2, which confirms the sources of flooding, appraises the adequacy of existing information and determines the extent of additional surveys and the degree of modelling that will be required. Stage 2 must be sufficiently detailed to allow the application of the sequential approach (as described in Section 1.3.3) within the flood risk zone.

- **Stage 3 - Detailed Flood Risk Assessment**

A detailed FRA is carried out where necessary to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk.

1.3.2 Geographic Scales of a Flood Risk Assessment

Flood Risk Assessments are undertaken at different scales by different organisations for many different purposes. The scales are as follows: -

- **Regional Flood Risk Appraisal**

A Regional Flood Risk Appraisal (RFRA) provides a broad overview of the source and significance of all types of flood risk across a region and highlights areas where more detailed study will be required. These appraisals are undertaken by regional authorities.

- **Strategic Flood Risk Assessment**

A Strategic Flood Risk Assessment (SFRA) provides a broad (area-wide or county-wide) assessment of all types of flood risk to inform strategic land use planning decisions. The SFRA allows the Planning Authority to undertake the sequential approach (described below) and identify how flood risk can be reduced as part of the development plan process.

- **Site Flood Risk Assessment**

A Site Flood Risk Assessment (Site FRA) is undertaken to assess all types of flood risk for a new development. This requires identification of the sources of flood risk, the effects of climate change on the flood risk, the impact of the proposed development, the effectiveness of flood mitigation and management measures and the residual risks that then remain.

This assessment is for a *Plan* and therefore is at SFRA scale.

1.3.3 The Sequential Approach

The sequential approach in terms of flood risk management is based on the following principles: -

AVOID - SUBSTITUTE - JUSTIFY - MITIGATE – PROCEED.

The primary objective of the sequential approach is that development is primarily directed towards land that is at low risk of flooding (**AVOID**).

The next stage is to ensure that the type of development proposed is not especially vulnerable to the adverse impacts of flooding (**SUBSTITUTION**).

The Justification Test is designed to rigorously assess the appropriateness, or otherwise, of particular developments that, for various reasons, are being considered in areas of moderate or high flood risk (**JUSTIFICATION**).

The test is comprised of two processes, namely the Plan-Making Justification Test and the Development Management Justification Test. Only the Plan, and this is described as

follows former (Plan-Making Justification Test) is relevant to a Strategic Flood Risk Assessment for a Plan, and this is described as follows.

Justification Test for Development Plans

“Where, as part of the preparation and adoption or variation or amendment of a development/local area plan, a planning authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate as set out in Table 3.2 of the Guidelines, all of the following criteria must be satisfied: -

- 1) *The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.*
- 2) *The zoning or designation of the lands for the particular use or development type is required to achieve the proper and sustainable planning of the urban settlement and in particular:*
 - a. *Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement*
 - b. *Comprises significant previously developed and/or under-utilised lands;*
 - c. *Is within or adjoining the core of an established or designated urban settlement;*
 - d. *Will be essential in achieving compact or sustainable urban growth;*
 - e. *There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.*
- 3) *A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere.*

N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment” (See p. 37 of the Flooding Guidelines).

MITIGATION is the process where the flood risk is reduced to acceptable levels by means of land use strategies or by means of detailed proposals for the management of flood risk and surface water, all as addressed in the Flood Risk Assessment. The decision to **PROCEED** should only be taken after the Justification Test has been passed.

1.3.4 Purpose of Strategic Flood Risk Assessment

The purpose of this SFRA is to integrate an assessment of flood risk into the planning process, specifically to:

- i. Provide for an improved understanding of flood risk issues within the County Development Plan,
- ii. Identify whether flood risk is an issue in the settlements for which the development management framework (e.g. zoning map or settlement boundary) is being altered.

This SFRA presents available flood related data to identify areas within which a detailed Flood Risk Assessment will be required. It also reviews the existing text and policies in the Development Plan in relation to flooding and proposes changes where necessary. The concluding section discusses the approach to monitoring and review of this SFRA.

2. Strategic Flood Risk Assessment

2.1 Stages

The Strategic Flood Risk Assessment for the plan area is based on two stages: -

- Stage 1 Flood Risk Identification;
- Stage 2 Initial Flood Risk Assessments.

2.2 Stage 1 Flood Risk Identification

This purpose of this stage is to identify whether there are any flooding or surface water management issues relating to the plan area that may warrant further investigation. Sources that were consulted are outlined below.

2.2.1 Regional Flood Risk Appraisal

A *Regional FRA* was carried out and published as Chapter 8 to the Strategic Environmental Assessment of the *Border Regional Planning Guidelines 2010-2022*³. This document provided guidance on the issues to be addressed in any SFRA.

The *Regional FRA* referred types of flooding affecting key towns in the region. Carrick-on-Shannon was noted as being susceptible to 'fluvial' flood risk in 'riverside areas' and that the Local Authority "*permit only appropriate development subject to mandatory flood risk assessment in identified flood risk areas and review indicative flood levels based on climate change*" (p. 151).

2.2.2 Office of Public Works Publications

The Office of Public Works (OPW) is the lead agency for flood risk management in Ireland and is the national competent authority for the EU Floods Directive. OPW works in close partnership with all Local Authorities in delivering the objectives of the CFRAM Programme.

To comply with the EU *Floods' Directive*, the OPW commenced a CFRAM (Catchment Flood Risk Assessment and Management) programme in Ireland in 2011.

The CFRAM Programme comprises three phases: -

1. The Preliminary Flood Risk Assessment (PFRA): 2011;
2. The CFRAM Studies and parallel activities: 2011-2015;
3. Implementation and Review: 2016 onwards.

The Programme provides for three main consultative stages: -

1. 2011 Preliminary Flood Risk Assessments;
2. 2013 Flood Hazard Mapping;
3. 2015 Flood Risk Management Plans.

2.2.2.1 Preliminary Flood Risk Management

The *Floods' Directive* required Member States to undertake a national preliminary flood risk assessment by 2011 to identify areas where significant flood risk exists or might be

³ Accessible at www.border.ie (Border Regional Authority)

considered likely to occur. In August 2011, the OPW published the National Preliminary Flood Risk Assessment, Draft for Public Consultation which comprised a Report and a set of maps.

This national screening exercise identified where there may be a significant risk associated with flooding, based on available and easily derivable information. The objective of the PFRA is to identify Areas for Further Assessment (AFA's) and this further assessment will take place through Catchment Flood Risk Assessment and Management Studies (CFRAMs).

Leitrim County falls into two separate 'catchment areas'; Shannon and North West.

Six settlements are identified as probable or possible Areas of Further Assessment⁴: -

- i. Leitrim village, Mohill and Drumshanbo within the Shannon catchment⁵;
- ii. Ballinamore, Manorhamilton and Keshcarrigan within the Northwest catchment⁶.

The OPW has prepared maps identifying the Areas of Further Assessment. The OPW stated that the maps, although draft and indicative, may be of use to the Local Authorities in a number of areas of activity, particularly in the performance of their planning function in relation to the implementation of the *Flooding Guidelines*.

2.2.3 Catchment Based Management Plans

Phase 2 of the CFRAM programme is the production of CFRAM studies. The OPW in cooperation with various Local Authorities are producing Catchment Flood Risk Assessment and Management Studies. These CFRAMS aim to map out current and possible future flood risk areas and develop risk assessment plans. They will also identify possible structural and non-structural measures to improve the flood risk of the area.

The two CFRAMS that will affect the Draft Plan are the Shannon CFRAM and Northwest/Neagh-Bann CFRAM. A scoping of the CFRAMS for the Shannon Catchment identified Leitrim village, Mohill and Drumshanbo, as areas of potential significant flood risk, and worthy of further risk review. Scoping of the CFRAMS for the Northwest Catchment identified Ballinamore and Keshcarrigan as areas of potential significant flood risk, and worthy of further risk review.

Shannon River Basin District

The Shannon River Basin District is the largest River Basin District (RBD) in Ireland, covering approximately 17,800km² and more than 20% of the island of Ireland. The Shannon RBD is an International RBD. The RBD includes the entire catchment of the River Shannon and its estuary as well as some catchments in North Kerry and West Clare that discharge to the Atlantic. The southern portion of County Leitrim, taking in the catchments around Mohill and Carrick-on-Shannon and Lough Allen catchment fall within this RBD.

The main aims of the Shannon CFRAM Study are to: -

- i. To produce detailed flood mapping in order to identify and map the existing and potential future flood hazard and risk areas within the study area.
- ii. Build the strategic information base necessary for making informed decisions in relation to managing flood risk.

⁴ Carrick-on-Shannon is also included in this preliminary group.

⁵ Dromod was identified for further assessment following this stage by Leitrim County Council.

⁶ Tullaghan was identified for further assessment following this stage by Leitrim County Council.

- iii. Identify viable structural and non-structural measures and options for managing the flood risks for localised high-risk areas and within the catchment as a whole.
- iv. Prepare a Flood Risk Management Plan for each of UoM for the study area (Strategic Environmental Assessment) that sets out the measures and policies, including guidance on appropriate future development, that should be pursued by the local authorities, the OPW and other stakeholders to achieve the most cost effective and sustainable management of flood risk within the study area taking account of the effects of climate change and complying with the requirements of the Water Framework Directive.

North Western River Basin District

The North Western district is a cross-border river basin district with approximately 7,400 km² in Ireland and 4,900 km² in Northern Ireland. It takes in all of County Donegal, large parts of Fermanagh, Cavan, Derry, Monaghan and Tyrone, significant areas of Leitrim and Longford and a small portion of Sligo. Two areas within Leitrim county fall within the Northwest catchment: -

1. North Leitrim (north of Killarga village, Thur Mountain and);
2. Southeast Leitrim (catchments around Ballinamore and Carrigallen and south of Slieve Anierin).

The main aims of the North West CFRAM Study are to: -

- i. assess flood risk, through the identification of flood hazard areas and the associated impacts of flooding;
- ii. identify viable structural and non-structural measures and options for managing the flood risks for localised high-risk areas and within the catchment as a whole;
- iii. prepare a strategic Flood Risk Management Plan (FRMP) and associated Strategic Environmental Assessment (SEA) that sets out the measures and policies that should be pursued to achieve the most cost effective and sustainable management of flood risk;
- iv. ensure that full and thorough public and stakeholder consultation and engagement is achieved.

Map 1 River Basin Districts in County Leitrim



2.2.4 Flood Risk Review

Following the preliminary flood risk review process a number of communities were identified within the respective catchment areas for Leitrim as being 'Areas for Further Assessment'. The Flood Risk Review Report for Shannon and Northwest District CFRAMs set out the recommendations for 'Area for Further Assessment' based on the site visits (by consultant), but these recommendations form just one of the 'strands' that fed into the finalisation of the definitive CFRAM list. Consequently, some of the 'Areas for Further Assessment' recommendations in the Flood Risk Review Report will not necessarily make it into the final list of AFAs reported to the European Commission and being taken forward in the CFRAM Studies. A summary of these recommendations is outlined below in Table 1.

Table 1 Recommendations for Leitrim Communities during Flood Risk Review

<i>ID</i>	<i>Site</i>	<i>PFRA Status</i>	<i>FRR Rec Status</i>	<i>Comment following Site Visit</i>
360567	Ballinamore	Risk Review	Area for Further Assessment	Significant risk confirmed despite reduction in receptors.
365490	Keshcarrigan	Risk Review	Not an Area for Further Assessment	FRI score remains below threshold.
CAR 16	Carrick-on-Shannon/Cortober	Community at Risk	Area for Further ⁷ Assessment	No specific comment provided.
AFRR 51	Dromod	Area of Further Risk Review	Area for Further Assessment	No specific comment provided.
CAR 26	Drumshanbo	Community at Risk	Area for Further Assessment	No specific comment provided.
AFRR 23	Jamestown	Area for Further Assessment	Not an Area for Further Assessment	No specific comment provided.
AFRR 28	Leitrim Village	Area for Further Assessment	Area for Further Assessment	No specific comment provided.
CAR 41	Mohill	Community at Risk	Area for Further Assessment	No specific comment provided.

Source: OPW CFRAMs Flood Risk Review Reports

As part of the consultation undertaken within the Flood Risk Review, Local Authorities were invited to highlight any areas of concern they felt had not been picked up as part of the PFRA process.

These sites do not strictly form part of the Flood Risk Review, however where the discussions with Local Authorities suggest these sites are potentially of equivalent or higher risk than sites currently being taken forward in the CFRAM.

Tullaghan in north County Leitrim was identified at this point in the process and noted to have: -

"13 properties within the PFRA fluvial extents and located approximately 750m from the Bundoran AFA boundary. Potential to include within the Bundoran AFA pending agreement from Leitrim County Council and OPW".

Site assessments reports, including maps of Ballinamore and Keshcarrigan have been published as part of the Flood Risk Review Report for the northwest catchment. These maps will be referred to in Section 3 of this Report.

⁷ Also known as Areas of Potential Significant Risk (APSR).

The Flood Risk Review for the Shannon catchment (CFRAM) provides additional details relating to communities identified as Areas for Further Risk Review and subsequently recommended for Designation as Areas of Potential Significant Risk (APSR). These include: -

- i. *Leitrim Village (AFRR-28) - There is historic evidence of flooding in Leitrim Village that strongly indicates that there is a significant risk from flooding. This flood risk was confirmed during the site visit where low lying businesses, which have flooded in the past, were identified. Housing estates have also been constructed in the floodplain. This flood risk was confirmed during discussions with Leitrim County Council.*
- ii. *Dromod (AFRR-51) - Proven and potential flood risk to properties on the banks of the Shannon and adjacent to the railway line (from the Eslin River). This flood risk was confirmed during discussions with Leitrim County Council.*

For all of the above flood risk communities to be brought forward to the final CFRAM studies, flood risk maps and flood hazard maps will be drawn in 2013. In the absence of finalised flood zone maps from the OPW and in the absence of completed CFRAM studies, a combination of the PFRA and Risk Review maps and alternative available sources of information will be used.

Public Consultation Days will be held during Summer 2013 to launch the draft Flood Hazard Maps for each Area for Further Assessment (these are areas that have been identified as being at greater risk of flooding compared to other locations within the Study area).

2.2.5 Alternative available sources

The data listed below is available for the County and provides information on the historical occurrence of flooding. This data was mapped for all settlements considered to be at risk of flooding under this CDP. Flooding and surface water issues in the County were also identified through consultation with the Area Engineers and from in-house sources.

i) OPW Flood-Events Mapping

As part of the National Flood Risk Management Policy, the OPW developed the www.floodmaps.ie web-based dataset, which contains information concerning historical flood data, displays related mapped information and provides tools to search for and display information about selected flood events.

ii) OPW Benefitting-Lands Mapping

These maps were prepared to identify areas that would benefit from land drainage schemes, and typically indicate low-lying land near rivers and streams that might be expected to be prone to flooding.

iii) Mineral Alluvial-Soil Mapping

The soils and subsoils maps were created by the Spatial Analysis Unit at Teagasc. The project was completed in May 2006 as a collaboration between Teagasc, the Geological Survey of Ireland (GSI), the Forest Service and the Environmental Protection Agency (EPA). The presence of alluvial soils can indicate areas that have flooded in the past (the source of the alluvium).

iv) Ordnance Survey Ireland - 'Lands liable to floods' Mapping (6" OSi maps)

These maps have been studied to see if there are any areas marked as being 'Liable to Floods' in or in the vicinity of the 11 no. settlements. It is noted that the OS maps simply show the text 'Liable to Floods' without delineating the extent of these areas.

It should be noted that some of this data is historically derived, not prescriptive in relation to flood return periods and not yet predictive or inclusive for climate change analysis. Many of these maps were based on survey work carried out from 1833-1844 with many updated in the 1930s and 1940s. Consequently, these maps do not show or take account of recent changes in surface drainage, such as development in floodplains, road realignments or drainage works for forestry or agriculture. So there is significant potential that flood risk in some areas may have changed since they were prepared.

Internal Consultation

In-house information was used regarding historical flooding and flood relief works in the areas under consideration.

2.2.6 Flood Risk Indicators

Having regard to all of the information sources as outlined above, the occurrence of flood risk indicators for each settlement included in the Plan is identified in a Flood Risk Indicator Matrix. The settlements indicated in Table 2 below were identified as potential areas at risk of flooding, therefore the assessment proceeds to Stage 2.

Table 2 Flood Risk Indicator Matrix

Community	floodmaps.ie	Alluvial Soils	Benefitting Lands	OSi 6" Lands	Local Authority Information	Preliminary CFRAMS Information
Ballinamore	No flood incident points recorded in town.	Alluvial soils mapped along various drainage channels.	Benefitting lands mapped along various drainage channels from Dromore Lough, surrounding George's Lough and along Canal.	Stream located at northerly part of development zone shown liable to floods		Identified as Area for further assessment.
Kinlough	No flood incident points recorded in town.	No alluvial soils mapped in village.	No benefitting lands mapped in town.	No indication of flooding occurrences shown.		
Drumshanbo	Records of Area flooded north of town flanking Lough Allen.	Alluvial soils mapped along various drainage channels.	No benefitting lands mapped in town.	Lands to the north in Carricknabrack described as 'Liable to Flooding'.	Flooding recorded at Carricknabrack, north of town leading to Lough Allen Hotel.	Identified as Area for further assessment.
Mohill	No flood incident points recorded in town.	No alluvial soils mapped in village.	Area between R201 and R202 mapped as 'Drainage District'.	No indication of flooding occurrences shown.		
Manorhamilton	Flood event recorded on Owenmore river at Tawnymanus southwest of town.	Alluvial soils mapped along various drainage channels including extensive area west of town centre.	Benefitting lands mapped along Bonet River west of town and also along low-lying lands south of the town.	Environs feature extensive rocky outcrops and marshy lands. Lands liable to flooding west of town centre		
Carrigallen	No flood incident points recorded in village. Flood events along Cullies river east of village.	Alluvial soils west of town along drainage channels leading into Carrigallen Lough and other locations south of town centre.	Areas south of village and west of R203 mapped as 'Drainage District'.	No indication of flooding occurrences shown.		
Dromahair	Flood events recorded on Bonet river at Stonepark west of town and at Lough Nahoo, north of town.	Alluvial soils south, north and west of town along Bonet River & along drainage channel from Lough Nahoo.	Benefitting lands mapped along Bonet River south of town and also along low-lying lands east of the town.	No indication of flooding occurrences shown.		
Dromod	Flooding recorded on Eslin river at Dromod More south of village and at Aughry, west of village.	Alluvial and lake sediment soils west of village.	Benefitting lands mapped along Bonet River south of village and also along low-lying lands east of the town.	No indication of flooding occurrences shown.	Flooding recorded flanking railway station/Grace Court, north of village, along Shannon and south of village east of local road to Roosky.	Identified as Area for further assessment.

Community	floodmaps.ie	Alluvial Soils	Benefitting Lands	OSi 6" Lands	Local Authority Information	Preliminary CFRAMS Information
Leitrim	Records of Area flooded encompassing and absorbing the village and flanking the River Shannon & Ballinamore-Ballyconnell Canal.	No alluvial soils mapped in village, but alluvial soils along Shannon west of village.	Extensive areas of benefitting lands mapped along Ballinamore-Ballyconnell Canal east of village and tributaries to the east of village.	Lands to the northeast described as 'Liable to Flooding'.	Flooding recorded flanking Ballinamore-Ballyconnell Canal, the River Shannon & in Drumhierny townland to northeast.	Identified as Area for further assessment.
Tullaghan	Flood events recorded at Drowes river outfall and west of village (linked to high tides and heavy rain).	No alluvial soils mapped in village.	No benefitting lands mapped in town.	Lands to the north of Drowes River in County Donegal described as 'Liable to Flooding'.		
Keshcarrigan*	No flood incident points recorded in town.	No alluvial soils mapped in village.	Extensive areas of benefitting lands mapped along low-lying lands flanking the Ballinamore-Ballyconnell Canal, R209, Keshcarrigan Lough & Lough Scur.	Environs feature extensive rocky outcrops and marshy lands.		
Jamestown*	Flooding recorded along Shannon river channel, primarily covering Roscommon area, but also on Leitrim side.	Alluvial soils surrounding village along River Shannon.	No benefitting lands mapped in town.	No indication of flooding occurrences shown.	Flooding recorded along local road north of village leading to Carrick-on-Shannon.	
Dowra*	Flood event recorded beside Shannon River at southern entrance to Village		No benefitting lands mapped	No indication of flooding occurrences shown.		

*reviewed in the Preliminary CFRAM but not zoned for development in the Draft Plan

2.3 Stage 2 - Initial Flood Risk Assessment

The purpose of this stage is to ensure that all relevant flood risk issues are assessed in relation to the decisions to be made and potential conflicts between flood risk and development are addressed to the appropriate level of detail. In relation to the zoning of lands and the associated uses the Plan contains the following Statement;

In the case of lands at risk of flooding, the types of uses, including 'General Development' uses, may be further constrained having regard to the policies, objectives and guidelines of the *Draft County Development Plan* and in particular the Ministerial Guidelines '*The Planning System and Flood Risk Management - Guidelines for Planning Authorities*'.

It should be noted that under Variation No 1 to the County Development Plan 2009 – 2015 and under Variation No 1 to the Carrick on Shannon Local Area Plan 2010 – 2016, a comprehensive review of the zoning of lands was undertaken. The issue of flood risk was a significant element of the review of both Plans and in this regard lands were dezoned or rezoned as considered appropriate. A detailed flood risk strategy is included in the Carrick on Shannon Local Area Plan. The issue of flood risk management in respect to Carrick on Shannon will be considered under the review of the Local Area Plan which will take place following the adoption of the County Development Plan.

Based on our review of the CFRAMs to date, Drumshanbo, Dromod & Leitrim Village are considered at this point for further assessment under the CFRAM's study with respect to Flood Risk. It is noted that flooding has been recorded within an area outside the development zone of Jamestown.

2.3.1.1 Flood-Zone Mapping

Flood zones are geographical areas within which the likelihood of flooding is in a particular range. There are three types of flood zones defined: -

Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding);

Flood Zone B – where the probability of flooding from rivers and the sea is moderate (greater than 1% or 1 in 1000 for river flooding);

Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 1% or 1 in 1000 for river flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

2.3.2 Application of the Sequential Approach

Having identified the areas of flood risk within the Plan areas, the next step is to apply the sequential approach to land-use planning. The areas of flood risk were overlaid on the current zoning/boundary for each settlement. This zoning context was taken from Variation No. 1 to *Leitrim County Development Plan 2009-2015*, which provided the most recent development framework for the settlements. This identified where flood risk management and future development may cause a conflict.

The Guidelines have categorised land uses into three vulnerability classes and have also specified which vulnerability class would be appropriate in each flood zone, or where the Justification Test would be required.

The table of vulnerability classes (Table 3.1 of the Guidelines) is as follows: -

Table 3 Classification of vulnerability of different types of development

Vulnerability Class	Land uses and types of development which include⁸:
Highly-vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding; Hospitals; Emergency access and egress points; Schools; Dwelling houses, student halls of residence and hostels; Residential institutions such as residential care homes, children's homes and social services homes; Caravans and mobile home parks; Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less-vulnerable development	Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; Land and buildings used for agriculture and forestry; Waste treatment (except landfill and hazardous waste); Mineral working and processing; and Local transport infrastructure.
Water-compatible development	Flood control infrastructure; Docks, marinas and wharves; Navigation facilities; Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).

Source: Table 3.1 of the *Flooding Guidelines*

Table 3.2 of the *Flooding Guidelines* sets out how the vulnerability classes interact with the flood zones and when the Justification Test is required.

The table of vulnerability classes (Table 3.1 of the Guidelines) is as follows: -

Table 4 Interaction of vulnerability classes and flood zones

Development	Flood Zone A	Flood Zone B	Flood Zone C
Highly-vulnerable	Justification Test	Justification Test	Appropriate
Less Vulnerable	Justification Test	Appropriate	Appropriate
Water-compatible	Appropriate	Appropriate	Appropriate

Where some of the settlement is within either Flood Zone A or B, the need for a further review of flood risk, and the specific zoning objectives, is required. If the proposed zoning was found to be water-compatible and located within either Flood Zone A or B, there was no requirement to

⁸ Uses not listed here should be considered on their own merits.

apply the Justification Test. If, however, less vulnerable uses were proposed for Flood Zone A, or highly vulnerable uses were proposed for Flood Zones A or B, the Justification Test was applied, and if necessary, the zoning objective revised. This process is detailed below.

Note: Vulnerability to pluvial flood risk should not be a limitation to development, but should be incorporated into the local drainage strategy, therefore areas of pluvial flooding were not subjected to the Sequential Approach.

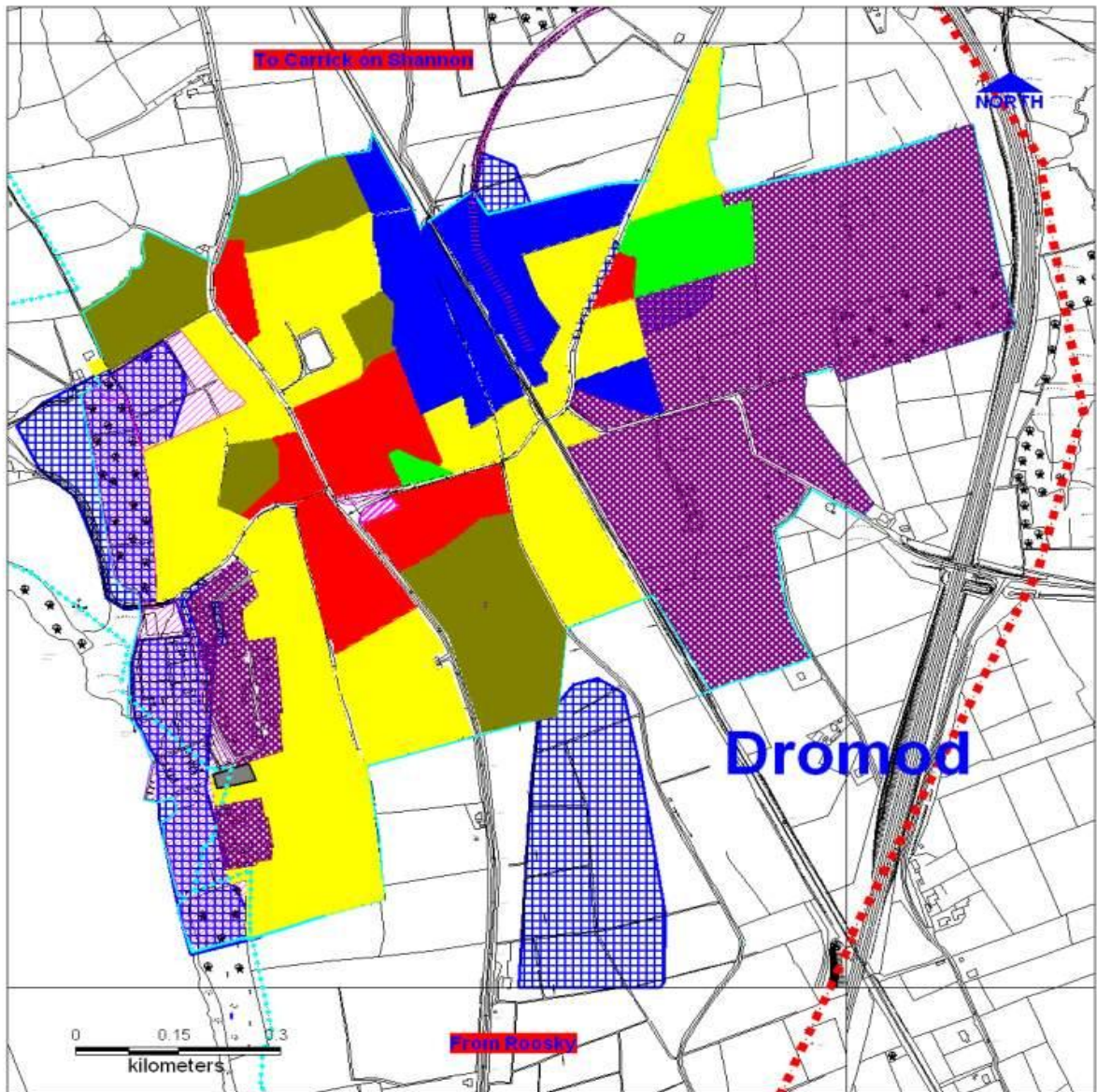
2.3.3 Zoning and Flood Risk Mapping.

The results of the Leitrim County Council Flood Mapping (November 2009 flooding event) and OPW mapping were overlain on the zoning map for all settlements and appropriateness of the extent and type of zoning reviewed in terms of flood risk management. Following flood risk assessment a significant amount of rezoning and dezoning resulted under Variation No 1 of the County Development Plan 2009 – 2015 and Variation No 1 of the Carrick on Shannon Local Area Plan 2010 – 2016. The Planning Authority is satisfied that the Plan contains a robust set of aims, policies and objectives in relation to flood risk management and will continue to assess proposal for development in terms of flood risk. In the case of Carrick on Shannon, flood risk management will be reviewed during the making of the Local Area Plan 2016 – 2022.

The flood risk assessment, as described above has identified lands located within Ballinamore, Dromod and Ballinaglera that should be dezoned because of the risk of flooding. The appropriate modifications are shown on the respective zoning maps attached to Appendix F of the Pre-Draft Plan.

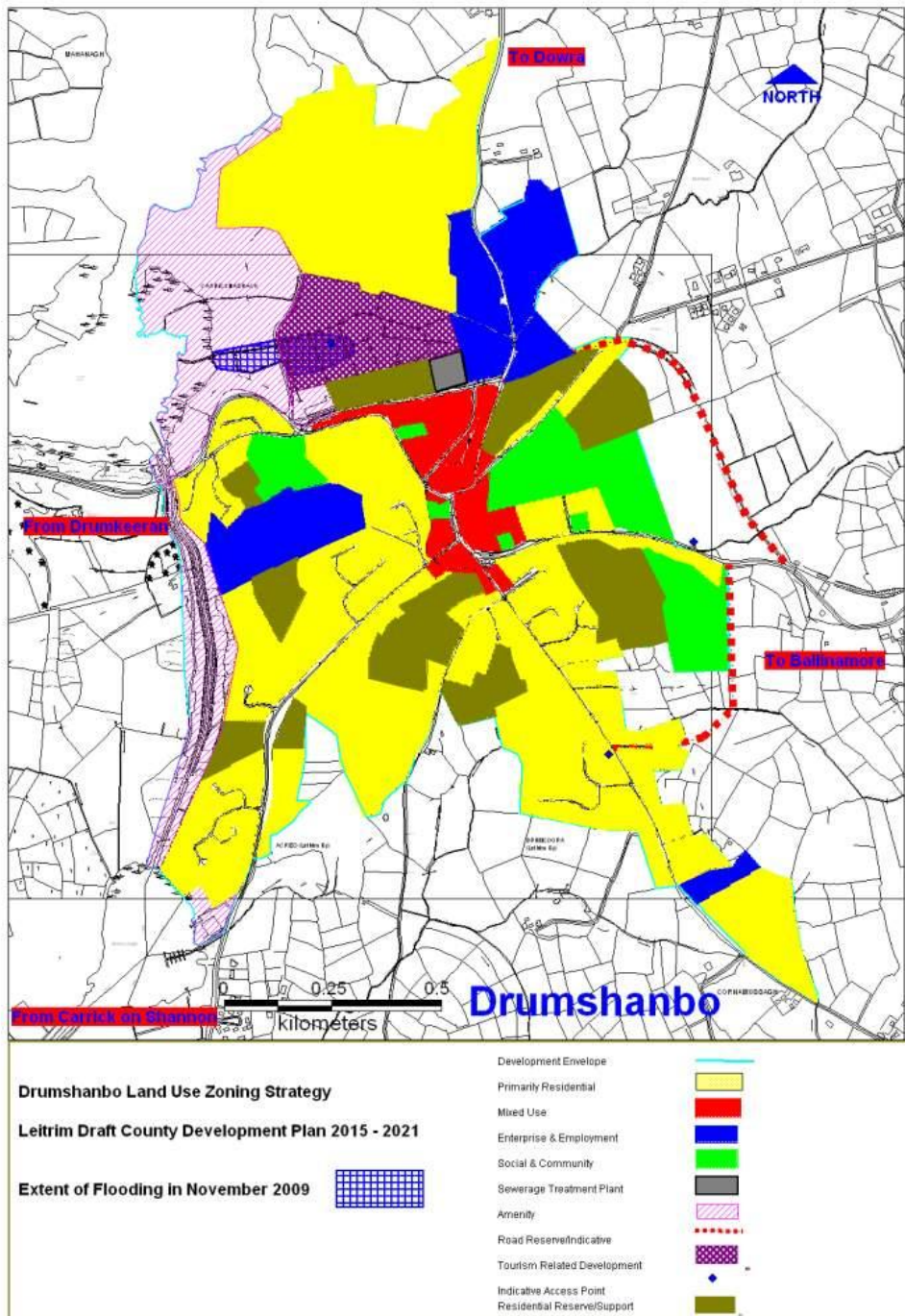
The Leitrim County Flood Mapping recorded in November 2009 in respect to Dromod, Drumshanbo, Leitrim Village and James town is shown below.

Map 2 Dromod Extent of Flooding in Dromod, November 2009

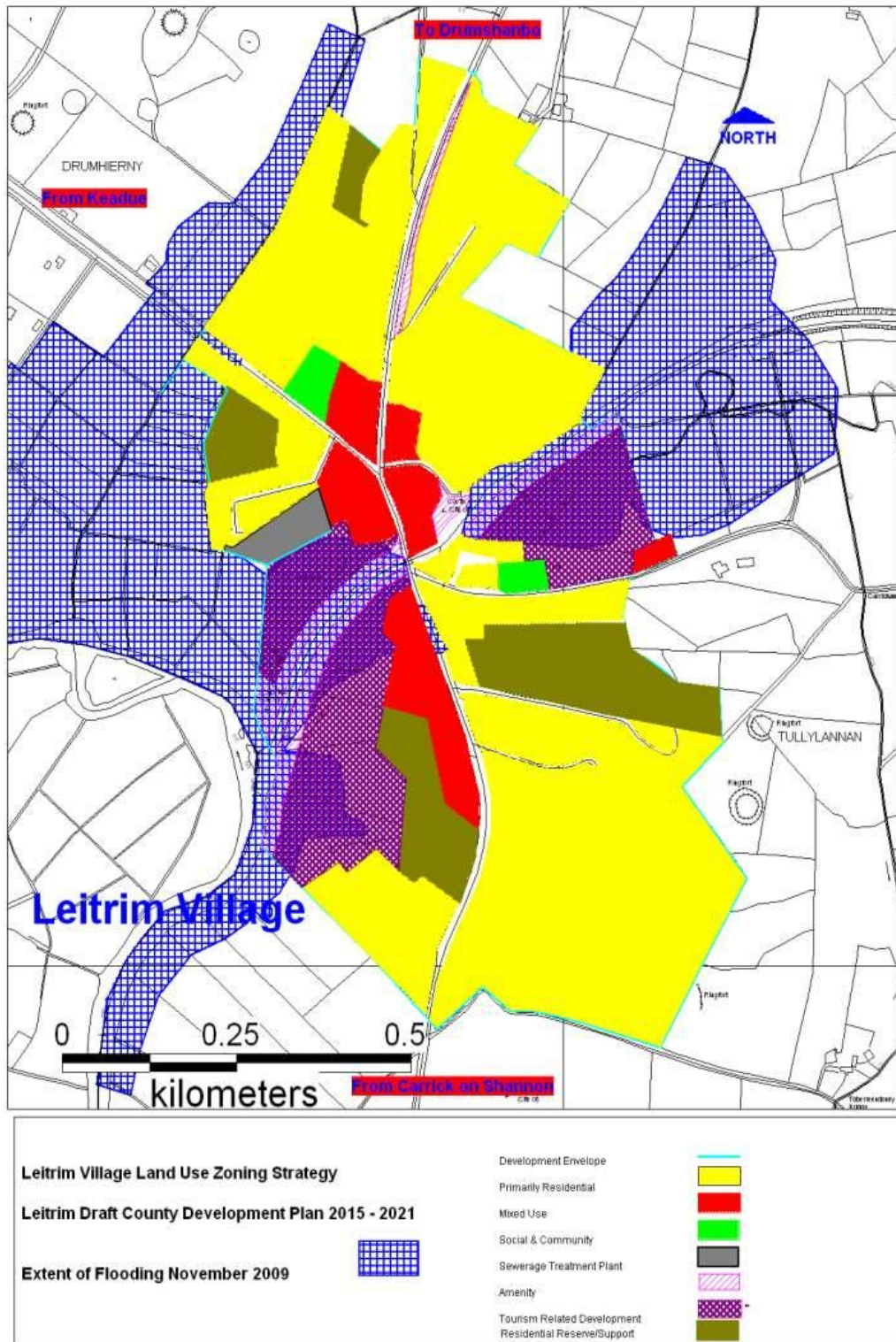


<p>Dromod Land Use Zoning Strategy</p> <p>Leitrim County Development Plan 2015 - 2021</p> <p>Extent of Flooding in November 2009</p>	<p>Development Envelope</p> <p>Primarily Residential</p> <p>Mixed Use</p> <p>Tourism Related Development</p> <p>Enterprise & Employment</p> <p>Social & Community</p> <p>Sewerage Treatment Plant</p> <p>Amenity</p> <p>National Primary Route N4</p> <p>Indicative Road Access</p> <p>Rail Reserve/Support</p>	
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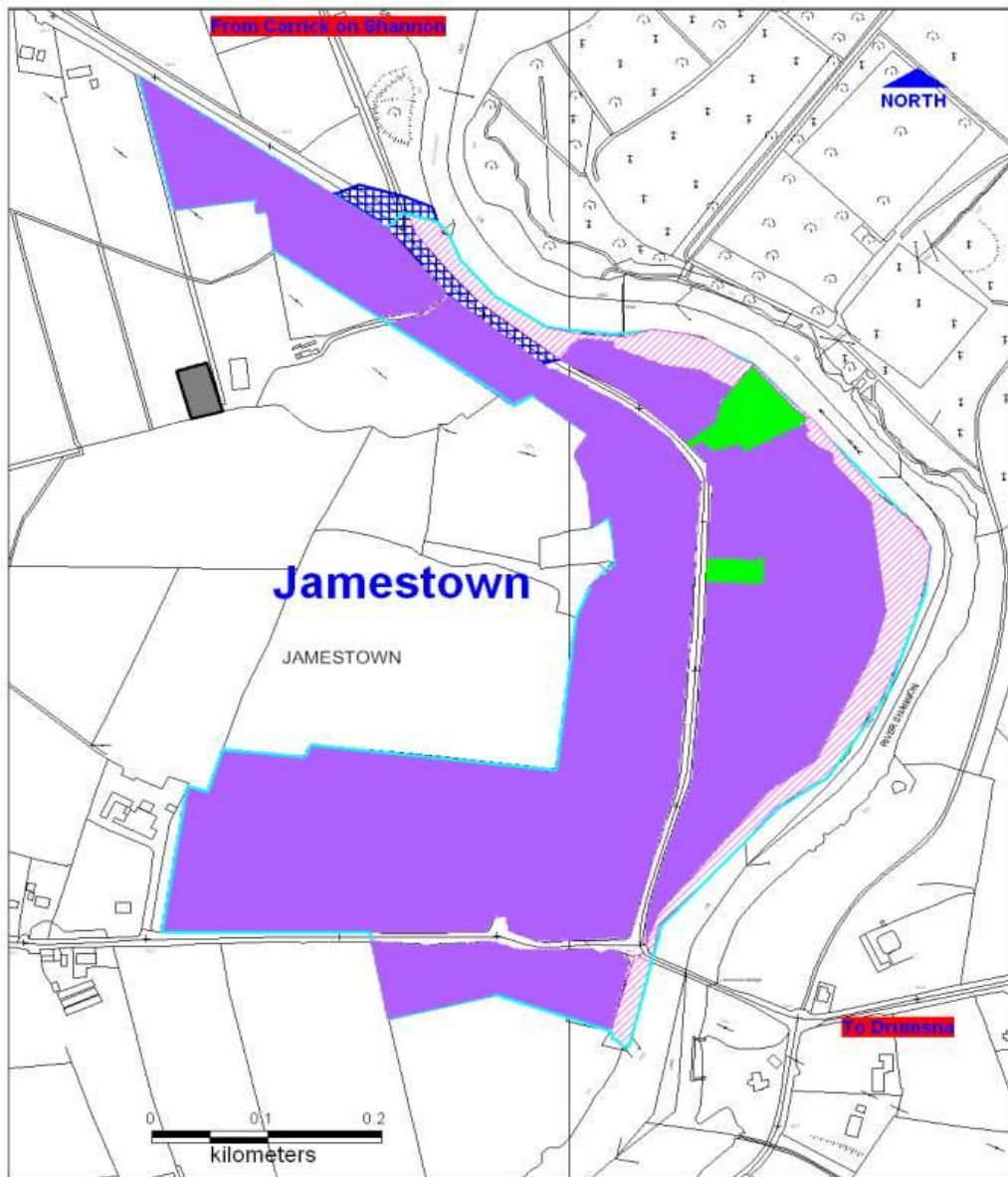
Map 3 Drumshanbo Extent of Flooding in Drumshanbo, November 2009




Map 4 Extent of Flooding in Leitrim Village, November 2009




Map 5 Extent of Flooding in Jamestown, November 2009



Jamestown Land Use Zoning Strategy
Leitrim Draft County Development Plan 2015 - 2021

Extent of Flooding November 2009 

Development Envelope	
General	
Social & Community	
Amenity	
Sewerage Treatment Plant	

3 Recommendations

This SFRA considers Leitrim county towns and villages for which a specific development framework is included in the *County Development Plan*.

For Carrick-on-Shannon functional area where strategic land-use decisions will be made through future revisions to the Local Area Plan, it is recommended that detailed flood risk assessments are carried out in respect of this area during review of the Local Area Plan.

For the areas identified through this SFRA that contain flood risk indicators, text will be included in the *County Development Plan* to ensure that development proposals shall, where appropriate, be subject to a site-specific Flood Risk Assessment, appropriate to the type and scale of the development being proposed and shall be carried out in line with the relevant Policies and Guidelines.

3.1 Modifications to Zoning Maps

- a) In the case of Ballinamore, it is recommended that the plot marked 1 and outlined in red, as shown on Appendix F of the Pre- Draft Plan is dezoned. The lands concerned are currently zoned 'Enterprise and Employment'.
- b) In the case of Dromod, it is recommended that the plot marked 1 and outlined in red, as shown on Appendix F of the Pre-Draft Plan is dezoned. The lands concerned are currently zoned 'Tourism Related Development'.
- c) In the case of Ballinaglera, it is recommended that the plot marked 1 and outlined in red, as shown on Appendix F of the Pre-Draft Plan is dezoned. The lands concerned are currently zoned 'General Development'.

3.2 Surface Water Drainage

This SFRA has also included a review of the current text in relation to flooding and surface water drainage. In line with the recommendations of the Guidelines, changes are proposed to the surface water drainage text to encourage the use of Sustainable Drainage Systems. The proposed text is set out below. It is recommended that the details in respect to surface water drainage as set out below are suitably incorporated into the Plan.

Surface Water Drainage

Surface water drainage systems are designed to channel stormwater (rainwater) to the nearest suitable river. Rain falling on impervious surfaces is usually directed into surface water drainage systems. Best practice is to separate the surface water drainage system from the foul drainage system to maximise the efficiency of our waste water treatment plants.

It is recommended that the following statement be suitably incorporated into the Plan.

Surface water drainage systems are effective at transferring surface water quickly, but they can cause the volume of water in the receiving watercourse to increase more rapidly thereby increasing flood risk. Sustainable Drainage Systems (SuDS) can play a role in reducing and managing run-off to surface water drainage systems as well as improving water quality. For larger developments, the use of Sustainable urban Drainage Systems (SuDS) techniques will be favoured.

3.2.1 Development Management Standards

The existing Guidelines on Flood Risk have been reviewed and are in the main considered robust. In order to further strengthen the Guidelines on Flood Risk within the Plan.

It is recommended that the following standards be suitably incorporated into the Plan;

- a) Individual developments shall be obliged, in all cases where surface water drainage measures are required, to provide a surface water drainage system separated from the foul drainage system;
- b) In the case of one-off rural dwellings or extensions, except in circumstances where an existing surface water drainage system is available to the proposed site for development, and which in the opinion of the Planning Authority has adequate capacity to accommodate the identified surface-water loading, surface water shall be disposed of, in its entirety within the curtilage of the development site by way of suitably sized soak holes;
- c) In the case of driveways, drainage measures shall be provided to a detail acceptable to the Planning Authority, so as to avoid run-off from the site to the adjoining public road;
- d) For all other greenfield developments, the limitation of surface water run-off to pre-development levels will be required. Where a developer can clearly demonstrate that capacity exists to accommodate run-off levels in excess of Greenfield levels, then the Planning Authority shall give consideration to such proposals on a case-by-case basis;
- e) In the case of brownfield development, whilst existing surface water drainage measures will be taken into account, some attenuation measures for surface water may be required at the discretion of the Planning Authority in the interests of balanced and sustainable development.
- f) All new development must be designed and constructed to meet the following minimum flood design standards:- Where streams, open drains or other watercourses are being culverted, the pipework shall be designed to adequately accommodate the maximum anticipated flows. (Access should be provided for maintenance as appropriate.)
- g) To give adequate allowance for climate change in designing surface water proposals a multiplication factor of 1.2 shall be applied to all river return periods up to 100 years except in circumstances where the OPW have provided advice specifying the particular multiplication factor for return periods up to 100 years. In the case of rainfall a multiplication factor of 1.1 shall be applied to rainfall intensities to make allowance for climate change requirements.

3.2.2 Monitoring and Review

As outlined in Section 2, additional information, in the form of CFRAM mapping, will be made available from the OPW later this year that will inform flood risk assessments in the County.

This SFRA is based on currently available data and in accordance with its status as a 'living document' it may be subject to modification by these emerging datasets of maps and plans as they become available. In the interim any development proposal in areas identified at risks of flooding shall be subject to an appropriate level of flood risk assessment.

It is recommended that the OPW be consulted and that their progress in implementation of the requirements of the EU Flood Directive is reviewed prior to the final adoption of the Plan.