



Barnesmore Gap Greenway

Appendix 9.2: Flood Risk Assessment

Donegal County Council

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1. Introduction

Roughan & O'Donovan Consulting Engineers has carried out a Site-Specific Flood Risk Assessment (SS-FRA) for a proposed Greenway at Barnesmore Gap, Co. Donegal. The SS-FRA has been conducted in accordance with 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' herein referred to as 'the Guidelines' as published by the Office of Public Works (OPW) and Department of Environment, Heritage and Local Government (DoEHLG) in 2009.

1.1 Scope of Report

Under The Guidelines a proposed development must undergo a Flood Risk Assessment (FRA) to ensure sustainable development and effective management of flood risk.

The scope of this SS-FRA includes:

- A review of "The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices (November 2009)" (OPW / DoEHLG),
- A description of the existing site conditions, the proposed development and the baseline data used in this report.
- A staged assessment of flood risk against the criteria and standards established by the Guidelines and national, regional and local planning policies.

2. The Legislative and Policy Context

2.1 National Policy

- Ireland's flood risk policy is guided by a combination of national strategies, EU directives, and local implementation plans. The key components include:
- Flood Risk Management Plans (FRMPs) developed under the Catchment Flood Risk Assessment and Management (CFRAM) Programme,
- Capital Flood Relief Schemes (FRS),
- Nature Based Solutions for Catchment Management (NbS-CM),
- Coastal Change Management Strategy,
- National Adaptation Strategy framework and Adaption Plan

The national CFRAM programme commenced in Ireland in 2011. The CFRAM Programme delivered on core components of the National Flood Policy, adopted in 2004, and on the requirements of the EU Floods Directive via the CFRAM studies, undertaken for each of the 29 river basins in Ireland.

The OPW is the lead organisation for flood risk management in Ireland. It is responsible for leading and co-ordinating the implementation of national flood risk management policy which involves the development of a planned programme of feasible works, with a greater emphasis on non-structural flood risk management measures. The Guidelines (DoEHLG /OPW, 2009), as amended by Circular PL 2/2014, introduce comprehensive mechanisms for the incorporation of flood risk identification, assessment, and management into the planning process. The application of the Guidelines is mandatory under Section 28 of the Planning and Development Act.

2.2 Regional Policy

The Donegal Regional Spatial and Economic Strategy (RSES) is part of the broader strategy developed by the Northern and Western Regional Assembly (NWRA) to guide sustainable development across the region, including Donegal. It provides a high-level development framework for the Northern and Western Region, aligning with the National Planning Framework (NPF) and government economic policies.

The Draft Donegal County Development Plan 2024–2030 (DCDP) aligns with the RSES and sets out strategic objectives to guide development in the County. It includes the Local Area Plans (LAP) for Ballybofey/Stranorlar, Bundoran, and Buncrana Municipal districts.

Flood Risk Management Objectives under the DCDP require the integration of Flood Risk into Planning, and that all Development proposals comply with the Planning system and Flood Risk Management Guidelines, recognising that Flood Risk is a key constraint in land use zoning and development decisions. The DCDP includes a Strategic Flood Risk Assessment (SFRA) that identifies flood prone areas that informs the LAP for Ballybofey/Stranorlar.

The LAP for Donegal Town is addressed by the Seven Strategic Towns Local Area Plan (Donegal County Council, 2018).

Under the DCDP and the LAPs SS-FRAs are required for developments within Flood Zones A or B. The adoption of Sustainable Urban Drainage Systems (SuDS) is promoted in all new developments. Development is to be avoided within natural floodplains in order to preserve their natural flood attenuation functions.

2.3 The Planning System and Flood Risk Management

The Guidelines introduced comprehensive mechanisms for the incorporation of flood risk identification, assessment and management into the planning process.

The Guidelines require the planning system at national, regional and local level to:

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

The underpinning principles of the Guidelines are:

1. Flood hazard and potential flood risk from all sources should be identified and considered at the earliest stage in the planning process and as part of an overall hierarchy of national responses coupled to regional appraisal and local and site-specific assessments of flood risk.
2. Development should preferentially be in areas with little or no flood hazard, thereby avoiding or minimising the risk. Development in the context of these Guidelines includes all construction, such as transport and utility infrastructure as well as residential and other buildings.
3. Development should only be permitted in areas at risk of flooding when there is no alternative, reasonable sites available in areas at lower risk that also meet the objectives of proper planning and sustainable development.
4. Where development is necessary in areas at risk of flooding an appropriate land use should be selected.
5. A precautionary approach should be applied, where necessary, to reflect uncertainties in flooding datasets and risk assessment techniques and the ability to predict the future climate and performance of existing flood defences. Development should be designed with careful consideration to possible future changes in flood risk, including the effects of climate change and / or coastal erosion so that future occupants are not subject to unacceptable risks.
6. Flood risk to, and arising from, new development should be managed through location, layout and design incorporating Sustainable Drainage Systems (SuDS) and compensation for any loss of floodplain as a precautionary response to the potential incremental impacts in the catchment.

The Guidelines specify a staged Approach to Flood Risk Assessment, carrying out only such appraisal and or assessment as is needed for the purposes of decision-making at the regional, development and local area plan levels, and also at the site-specific level. The stages of appraisal and assessment are:

- Stage 1: Flood Risk Identification: Identify if there are any surface water management issues related to either the area of regional planning guidelines, development plans and LAP's or a proposed development site that may warrant further investigation at the appropriate lower-level plan or planning application levels.
- Stage 2: Initial Flood Risk Assessment; confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing indicative flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures can be assessed. In addition, the requirements of the detailed assessment should be scoped; and

- Stage 3: Detailed Flood risk Assessment; to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

2.3.1 Types of Flood Hazard

1. Coastal flooding is caused by higher sea levels than normal, largely because of storm surges, resulting in the sea overflowing onto the land. Coastal flooding is influenced by the following three factors in combination: High tide level; Storm surges caused by low barometric pressure and wave action.
2. Groundwater flooding occurs when the level of water stored in the ground rises as a result of prolonged rainfall to meet the ground surface and flows out overground. Groundwater flooding tends to be localised and results from interactions of site-specific factors such as tidal variations. While water level may rise slowly, it may be in place for extended periods of time. Hence, such flooding may often result in significant damage to property rather than be a potential risk to life.
3. Inland flooding is caused by prolonged and/or intense rainfall. Inland flooding can include a number of different types:
 - a. Overland flow occurs when the amount of rainfall exceeds the infiltration capacity of the ground to absorb it. Excess water flows overland, ponding in natural hollows and low-lying areas or behind obstructions. This occurs as a rapid response to intense rainfall and eventually enters a piped or natural drainage system.
 - b. River flooding occurs when the capacity of a watercourse is exceeded or the channel is blocked or restricted, and excess water spills out from the channel onto adjacent low-lying areas (the floodplain). This can occur rapidly in short steep rivers or after some time and some distance from where the rain fell in rivers with a gentler gradient.
 - c. Flooding from artificial drainage systems results when flow entering a system, such as an urban storm water drainage system, exceeds its discharge capacity and the system becomes blocked, and / or cannot discharge due to high water levels in the receiving watercourse. This mostly occurs as a rapid response to intense rainfall. Together with overland flow, it is often known as pluvial flooding. Flooding arising from a lack of capacity in the urban drainage network has become an important source of flood risk, as evidenced during recent summers.
 - d. Flooding can also arise from the failure of infrastructure designed to store or carry water (e.g. the breach of a dam, a leaking canal, or a burst water main), or to protect an area against flooding (e.g. breach of a flood defence, failure of a flap valve or pumping station or blockage of a pipe or culvert). Because of the sudden onset, the impacts of this form of flooding can be severe and where appropriate should be assessed.

2.3.2 Flood Zones

Flood Zones are geographical areas within which the probability of flooding falls within a prescribed range. Flood Zones are central to flood risk assessment and management. Figure 2-1 shows an example of a Flood Zone map extracted from the Guidelines (OPW,2009).

Three Flood Zones are defined within the Guidelines based on the probability of river and coastal flooding only. The probability basis of the Flood Zone definitions are summarised in Table 2-1.

Delineation of Flood Zones should ignore the presence of defences. Areas that benefit from an existing Flood Relief Scheme (FRS) or flood defences, have a reduced probability of flooding, but can be particularly vulnerable due to the speed of flooding when overtopping or

a breach or other failure takes place. Hence development within these areas are exposed to a residual risk to flooding.



Figure 2-1 - Indicative flood zone map (extracted from The Planning System and Flood risk Management Guidelines (2009) p.15)

Maps such as Figure 2-1 show the risk of flooding associated with the specific sources of flooding for which they were generated and should not be used to conclude that an area is free of flood risk, as all other sources of flood risk such as groundwater, pluvial and drainage systems must be considered in assessing flood risk.

Table 2-1 - Fluvial and Coastal Flood Zone Definitions

Flood Zones	Definition	Annual Exceedance Probability
A	Probability of flooding from rivers, lakes and the sea is highest	Greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding
B	Probability of flooding from rivers and the sea is moderate	Between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding
C	Probability of flooding from rivers and the sea is low. Flood Zone C covers all areas of the plan which are not in zones A or B	Less than 0.1% or 1 in 1000 for both river and coastal flooding

2.3.3 Flood Risk

Flood risk results from the combination of the probability of a flood event occurring at a particular location and the consequences of that event on a given receptor. Flood risk is normally expressed as:

$$\text{Flood risk} = \text{Probability of occurrence} \times \text{consequence}$$

The consequences of a flood depend on both the severity of the flood event (depth, duration, and velocity) and the vulnerability of a particular receptor to harm from flooding.

The Guidelines recognise that the vulnerability of a development to flooding depends on the specific type of land use and the nature of the development. The Guidelines define vulnerability classes and provide representative categories of land use and developments for each vulnerability class. These definitions are summarised in Table 2-2.

Table 2-2 - Classification of vulnerability of different types of development (extracted from OPW, 2009 p.25)

Vulnerability Class	Land uses and type of development which include:
Highly vulnerable (including 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

Vulnerability Class	Land uses and type of development which include:
	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	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	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)

Uses not listed here should be assessed on their own merits

Defining the intrinsic vulnerability of land use and development types to flooding assists in choosing appropriate development types in areas that are prone to flooding. A matrix of the vulnerability classes and flood zone compatibility is presented in Table 2-3.

Most types of development would be considered inappropriate within Flood Zone A, and development within this Flood Risk Zone should be avoided. Developments within this zone should only be permitted under exceptional circumstances such as in city centres or in the case of essential infrastructure that cannot be located elsewhere. In cases where development cannot avoid areas of flood risk, or where circumstances require that the location of a vulnerability class falls within an inappropriate Flood Zone, a Justification Test is required.

Applications for minor development, such as small extensions to houses, and most changes of use of existing buildings and or extensions and additions to existing commercial and industrial enterprises, are unlikely to raise significant flooding issues, unless they obstruct important flow paths, introduce a significant additional number of people into flood risk areas or entail the storage of hazardous substances. Since such applications concern existing buildings, the sequential approach cannot be used to locate them in lower-risk areas, and the Justification Test will not apply. However, a commensurate assessment of the risks of flooding should accompany such applications to demonstrate that they would not have adverse impacts or impede access to a watercourse, floodplain or flood protection and management facilities. These proposals should follow best practice in the management of health and safety for users and residents of the proposal.

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. At the same time such centres may also have been targeted for growth in the National Spatial Strategy, regional planning guidelines and the various city and county development plans taking account of historical patterns of development and their national and strategic value. In addition, development plans have identified various strategically located urban centres and particularly city and town centre areas whose continued growth and development is being encouraged in order to bring about compact and sustainable urban development and more balanced regional development. Furthermore, development plan guidelines, issued by the Minister for the Environment, Heritage and Local Government under Section 28 of the Planning and Development Act 2000, have underlined the importance of compact and sequential development of urban areas with a focus on town and city centre locations for major retailing and higher residential densities.

Table 2-3 - Matrix of vulnerability versus flood zone to illustrate appropriate development (Adapted from OPW, 2009 p.25)

Vulnerability Class (The Guidelines section 3.5)	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

2.3.4 The Justification Test

The Justification Test is a rigorous assessment of the appropriateness or otherwise of developments that are proposed in areas of moderate to high flood risk. The test is an examination of such proposals against proper planning and sustainable development criteria and, if these are satisfied, against flood risk criteria to ensure that risks are reduced to an acceptable level and that flood risk is not increased elsewhere.

2.3.5 Sequential Approach

The Guidelines outline sequential approach that is to be applied to all levels of the planning process. This approach should also be used in the design and layout of a development. This approach is summarised graphically in Figure 2-2. In general, development in areas with a high risk of flooding should be avoided as per the sequential approach. However, this is not always possible as many town and city centres are within flood zones and are targeted for development.



Figure 2-2 - The sequential approach to Flood Risk Assessment (adapted from OPW, 2009, p 22)

The sequential approach makes use of flood risk assessment and of prior identification of Flood Zones for river and coastal flooding and classification of the vulnerability to flooding of different types of development, as illustrated Figure 2-2. It is essential that the risk potentially arising from other sources of flooding should also be considered in all areas and at all stages of the planning process.

3. Description Of Proposed Development

The proposed development consists of a 31km bi-directional shared walking, wheeling, and cycling Greenway route following the Greenway will follow the disused West Donegal Rail line. There is a further 6.5km of links which will provide additional connectivity and integration to surrounding amenities and active travel routes. The Greenway will form a mainly recreational environment. Refer to Chapter 4 of the EIAR (60701883-ACM-HGN-SW_ZZ_ZZ_ZZ-RP-HG-0006) for further description of the proposed development.

3.1 Description of the Development Location

The Greenway starts from a proposed Trailhead in Donegal town and follows the abandoned rail line out of Donegal Town, through Barnesmore Gap, terminating at a Trailhead in Ballybofey/Stranorlar. Between Donegal Town and Ballybofey/Stranorlar, the route is rural and peri-urban (**Error! Reference source not found.**). Barnesmore Gap is a glacially over deepened mountain pass formed along a structural fault in the Devonian granite. It is a steep, straight-sided valley with significant lateral moraines and glacial bedrock.

Appendix B shows the Greenway, which spans two Hydrometric Areas, the Donegal Bay North and Foyle Catchments. The route will traverse the Eske, MourneBeg and Finn sub catchments. The principal sources of fluvial flood risk to the proposed development include:

- The Eske river,
- The Clogher river,
- The Lowerymore river,
- The Burn Durnett,
- The Finn River.

The Eske River discharges to the Donegal Bay transitional water body to approximately 250 m southeast of the proposed Trailhead in Donegal Town.

The Greenway runs along two significant Lake Waterbodies, Lough Eske and Lough Mourne. Lough Mourne is a drinking-water protected lake and there is an active Uisce Éireann abstraction point at the northern extent of the lake.

There are no arterial drainage scheme channels in the area. There is an existing flood embankment on the Finn River at Ballybofey/Stranorlar. The ongoing Ballybofey/Stranorlar FRS, administered by the OPW, is examining technical options to improve the Standard of Protection of the existing flood risk management measures.

The Greenway route runs along or crosses the Special Areas of Conservation (SAC) listed below (Figure 3-1).

- Croaghonagh Bog SAC
- Lough Eske and Ardnamona Wood SAC
- River Finn SAC

Based on a review of the conservation objectives they are considered adapted to flooding.

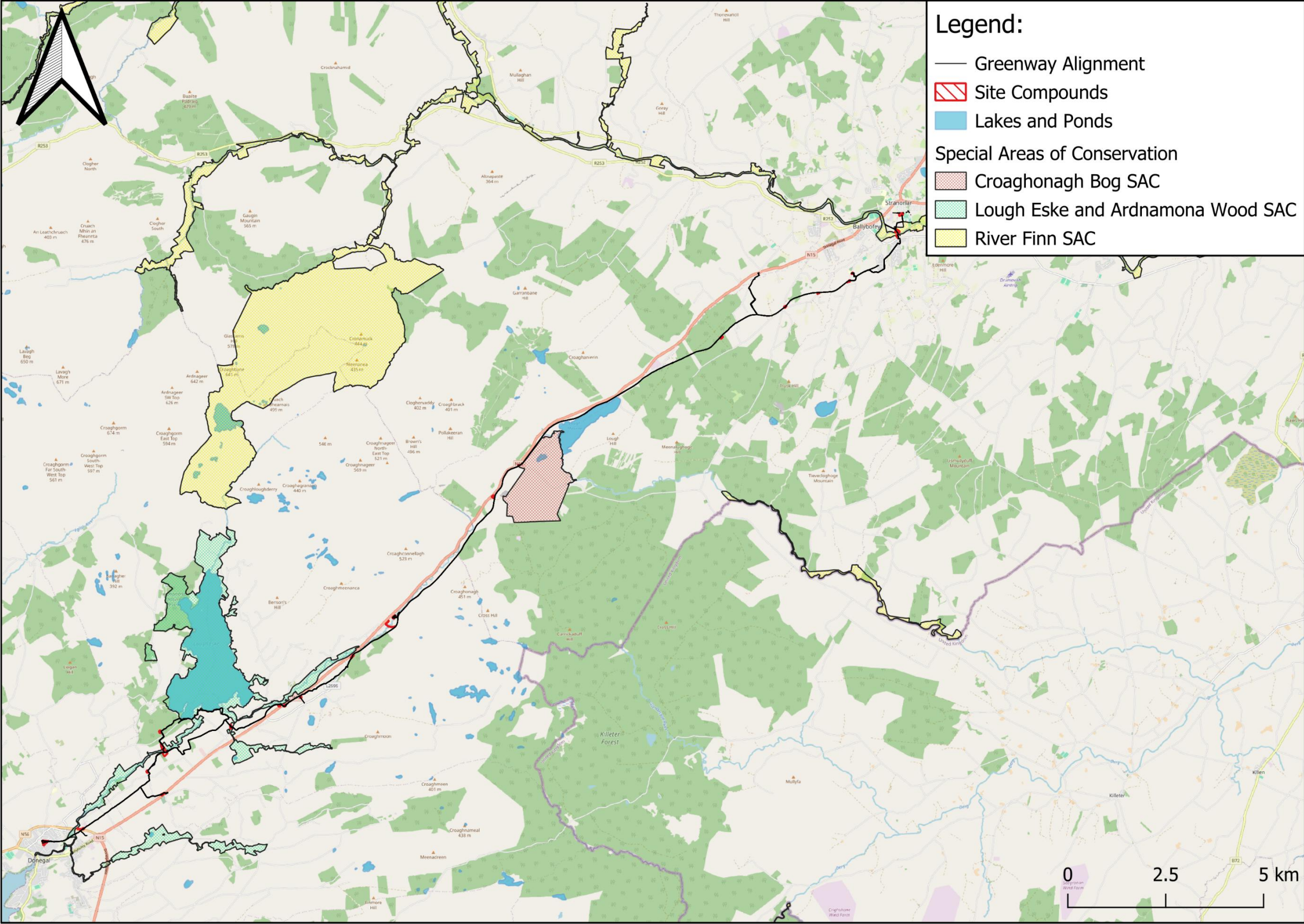


Figure 3-1 - Proposed Development location

3.2 Description of the Proposed Development

3.2.1 Greenway Construction

The Greenway cross section is designed to be approximately 3 m in width with 1 m verges. In proximity to the urban centres of Donegal Town and Ballybofey/Stranorlar the Greenway paved areas will be 4 m in width. The pavement structural design to be adopted on the railway is summarised in Table 3-1.

On the abandoned railway corridor, minimal earthworks will be required as the vertical profile follows the existing profile for the majority of the route. In offline greenfield areas, and on the approach to underpasses and bridges, cut and fill will be required at some locations.

Table 3-1 - Pavement Structural Design - Disused Railway

Pavement Course	Pavement on Abandoned Railway
Surface Course	Dense Bitumen Macadam surface course with grade 100 penetration binder, with 6 mm aggregate, 20 mm thick (formal description AC 6 close surf 70/100)
Base/Binder	Dense Macadam binder course with grade 100 penetration binder, with 20 mm aggregate, 50 mm thick (formal description AC 20 dense bin 70/100)
Subbase	Unbound Granular Material 100 mm thick (UGM A)

3.2.2 Trailheads

The Greenway will include four Trailheads. Table 3-2 presents a summary of proposed car parking facilities at the Trailheads. The proposed Trailheads will be designed to maximise permeable surfacing and SuDS elements to restrict runoff to the greenfield-equivalent rate. Where additional impermeable surfacing is proposed, drainage will be attenuated by a swale or a basin and released at the greenfield runoff rate to minimise impacts on the receiving environment. Hydrocarbon interception will also be incorporated into the design.

Table 3-2 - Trailheads & Car Parking

Location	Regular spaces	Accessible spaces	EV charging spaces	Universal EV charging spaces	Bus parking
Donegal Town	91	7	0	4	1
Lough Eske	30	2	0	0	0
Biddy's O'Barnes	30	2	2	0	1
Ballybofey and Stranorlar	89	4	2	3	3

3.2.2.1 Donegal Town Trailhead

The Trailhead in Donegal Town is located at the St. John Bosco Community Centre in Donegal Town. This area is within the 1% Annual Exceedance Probability (AEP) flood plain of the Eske River. (Figure 3-2).

It is proposed to construct an extension to the existing car park at the Community Centre. The car park following the extension will have 91 regular spaces, 7 accessible spaces, 4 universal EV charging spaces and 1 minibus spaces.

A satellite image of the location of the Trailhead is shown in Figure 3-2. The carpark extension will be built on an area of amenity grassland. The amenity grassland to the east of the carpark will be landscaped as far as the hardstanding at the Livestock mart, retaining much of the current land use.

The Trailhead will have a surface area of approximately 1155m². Vehicles will access the car park from Tirchonail Street, next to the St. John Bosco Community Centre.

The Trailhead location is bounded by Tirchonail Street (L19205) to the west and Railway Road (L19201) to the North. Both roads are designated as Local Transport Infrastructure (Council, Donegal County, n.d.). It is proposed to modify the junction between Tirchonail Street and Railway Road to accommodate the Trailhead, with Railway Road being re-aligned to the south through an area of existing amenity grassland as shown in **Error! Reference source not found.**

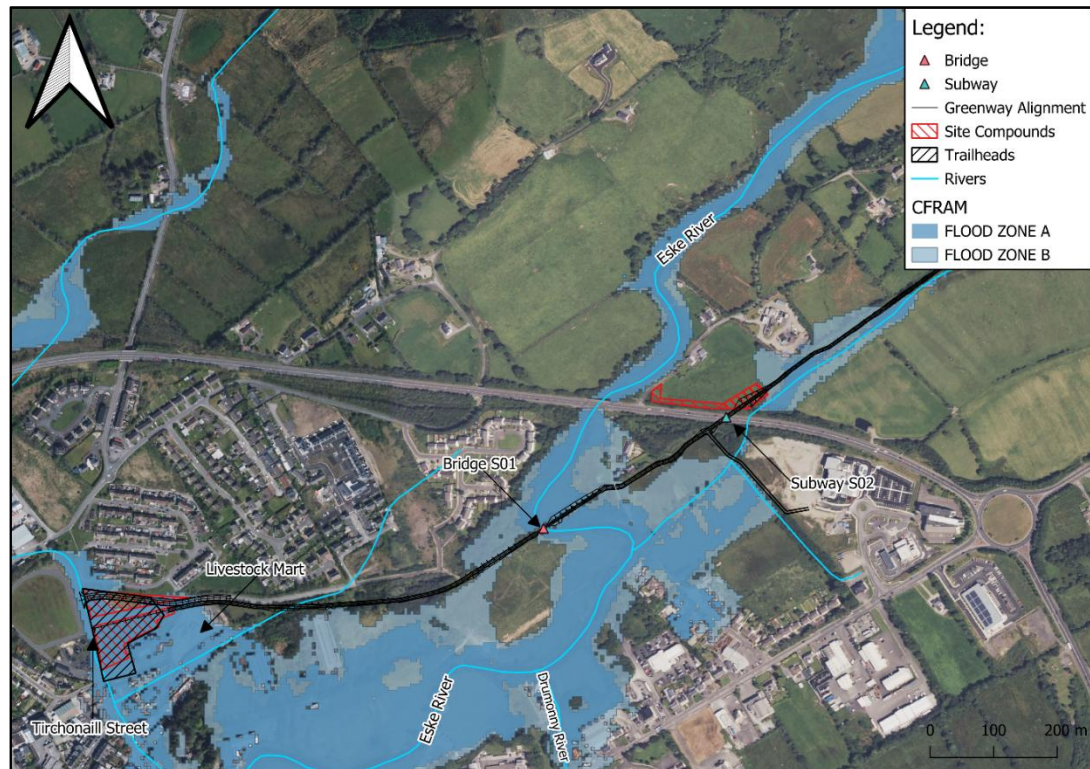


Figure 3-2 - Donegal Trailhead

The proposed Trailhead location is zoned as *Opportunity Site 5* within the Seven Strategic Towns LAP (Donegal County Council, 2018).

A summary of the proposed development elements is presented in Table 3-3. The flood vulnerability classification of each element has been assigned in accordance with the Guidelines (Table 2-2).

Table 3-3 - Donegal Trailhead development element summary

Element	Description	Vulnerable class
Car park	Flood resilient construction	Less vulnerable
Modified junction	Local transport infrastructure	Less vulnerable
Railway Road realignment	Local transport infrastructure	Less Vulnerable
Offline Greenway	Local Transport Infrastructure	Less vulnerable
Landscaping	Amenity open space	Water compatible
EV Charging Station	Utility	Highly Vulnerable
Existing car park SuDS	Minor development	Water compatible

3.2.2.2 Lough Eske Trailhead.

It is proposed to develop a car park Trailhead in Coillte owned woodland southwest of Lough Eske (Figure 3-3). The car park utilises an existing access road and yard. The access road and yard are currently unpaved and accessed from the local road. The car park will have 30 regular spaces and 2 accessible spaces. EV charging and minibus spaces shall not be provided. The Trailhead will incorporate landscaped amenity open space and has a surface area of 515m².

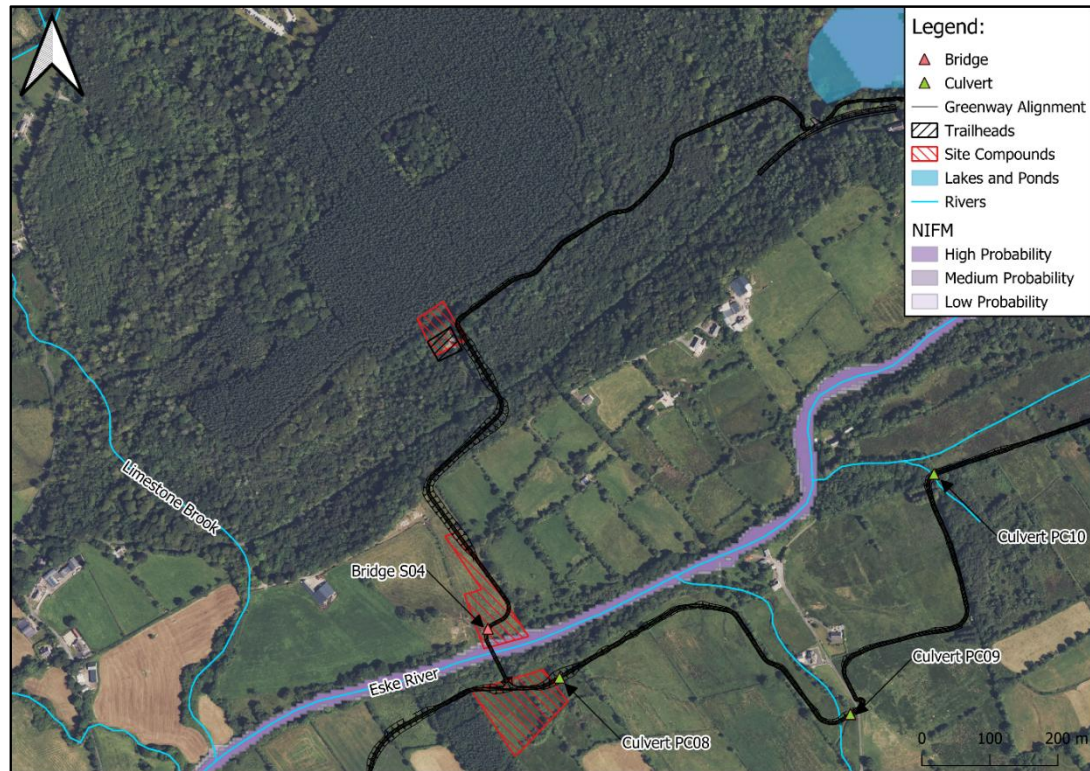


Figure 3-3 - Lough Eske Carpark

A summary of the proposed development elements is presented in Table 3-4. The flood vulnerability classification of each of the elements above has been assigned in accordance with the Guidelines (Table 2-2).

Table 3-4 - Lough Eske Trailhead development element summary

Element	Description	Vulnerable class
Car park	Flood resilient construction	Less vulnerable
Coillte track	Local transport infrastructure	Less vulnerable
Coillte Yard	Amenity open space	Water compatible
Landscaping	Amenity open space	Water compatible

3.2.2.3 Biddy's O'Barnes Trailhead

The proposed Trailhead at Biddy's O'Barnes will be constructed on an area of shrub on the west bank of the Lowerymore River (Figure 3-4). Access to the car park is from an existing local access road from the N15. The junction between the N15 and the local access road is at an elevation of approximately 94.5m Above Ordnance Datum (AOD). The lowest elevation of the carpark closest to the Lowerymore river is approximately 85.2 mAOD. The entrance to the Trailhead car park is at an elevation of approximately 85.2 mAOD. The area to the east, between the carpark and the river, will be landscaped amenity open space. The existing car park at the restaurant will be retained. The elevation of the existing car park is approximately 86.2 mAOD.

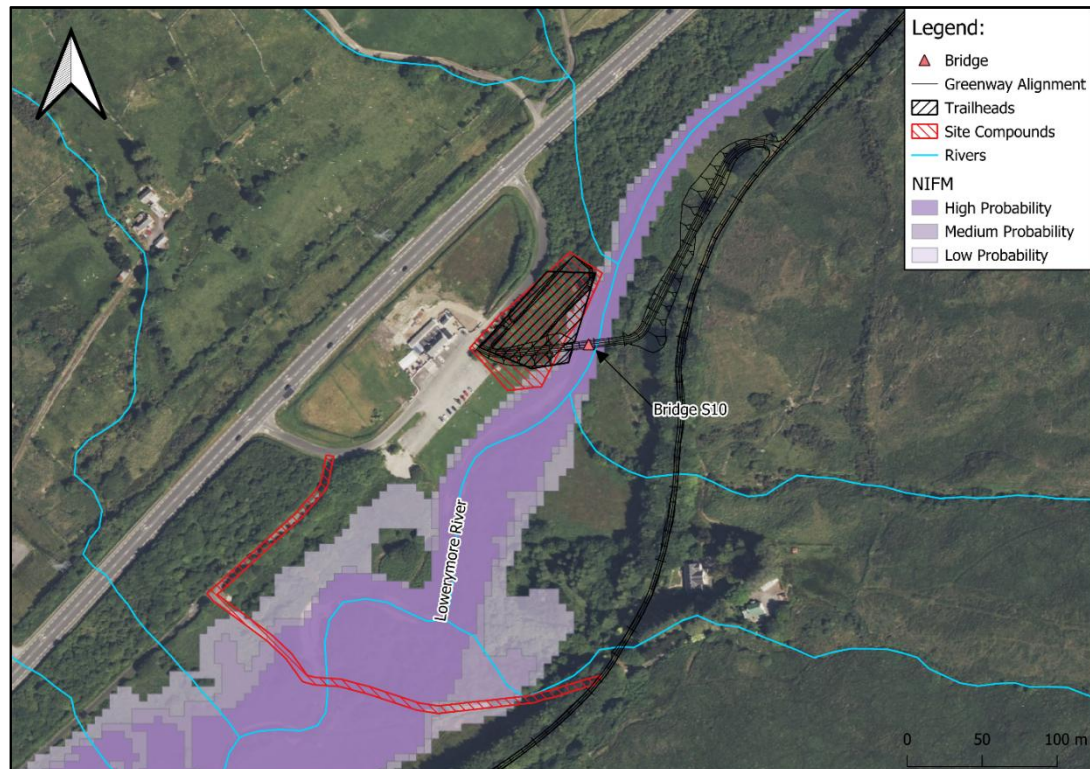


Figure 3-4 - Biddy's O'Barnes Trailhead

The Greenway will cross the Lowerymore river at the Trailhead, requiring an offline spur to be constructed on a new bridge (see Section 3.3.2).

A summary of the proposed development elements is presented in Table 3-5. The car park proposes the construction of 30 regular spaces, 2 accessible spaces, 2 EV charging spaces and 1 minibus parking space. The flood vulnerability classification of each of the elements identified above have been assigned in accordance with the Guidelines (Table 2-2).

Table 3-5 - Biddy's O'Barnes Trailhead development element summary

Element	Description	Vulnerable class
Car park	Flood resilient construction	Less vulnerable
Online Greenway	Local transport infrastructure	Less vulnerable
Offline Greenway	Local transport infrastructure	Less vulnerable
Landscaping	Amenity open space	Water compatible
Bridge	Local transport infrastructure	Less vulnerable
EV Charging Station	Utility	Highly Vulnerable

3.2.2.4 Ballybofey/Stranorlar Trailhead

It is proposed to develop a Trailhead car park in Ballybofey/Stranorlar. The car park will be constructed on a parcel of land within the Bus Eireann – Stranorlar Depot. The car park will have 89 regular spaces, 4 accessible spaces, 2 EV charging spaces, 3 universal EV charging spaces and 3 minibus spaces. In addition to the car park, the Trailhead will incorporate an area of landscaped open amenity space. The Trailhead will have a surface area of 765m².

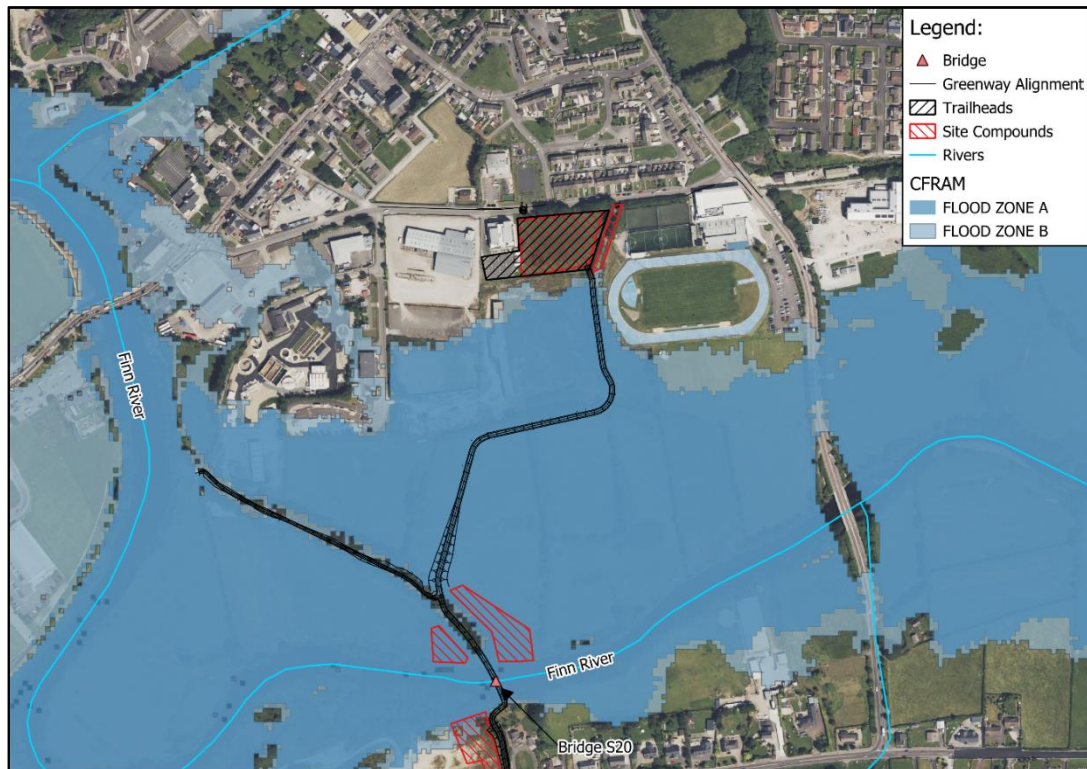


Figure 3-5 - Ballybofey/Stranorlar Trailhead

The offline spur Greenway shown in

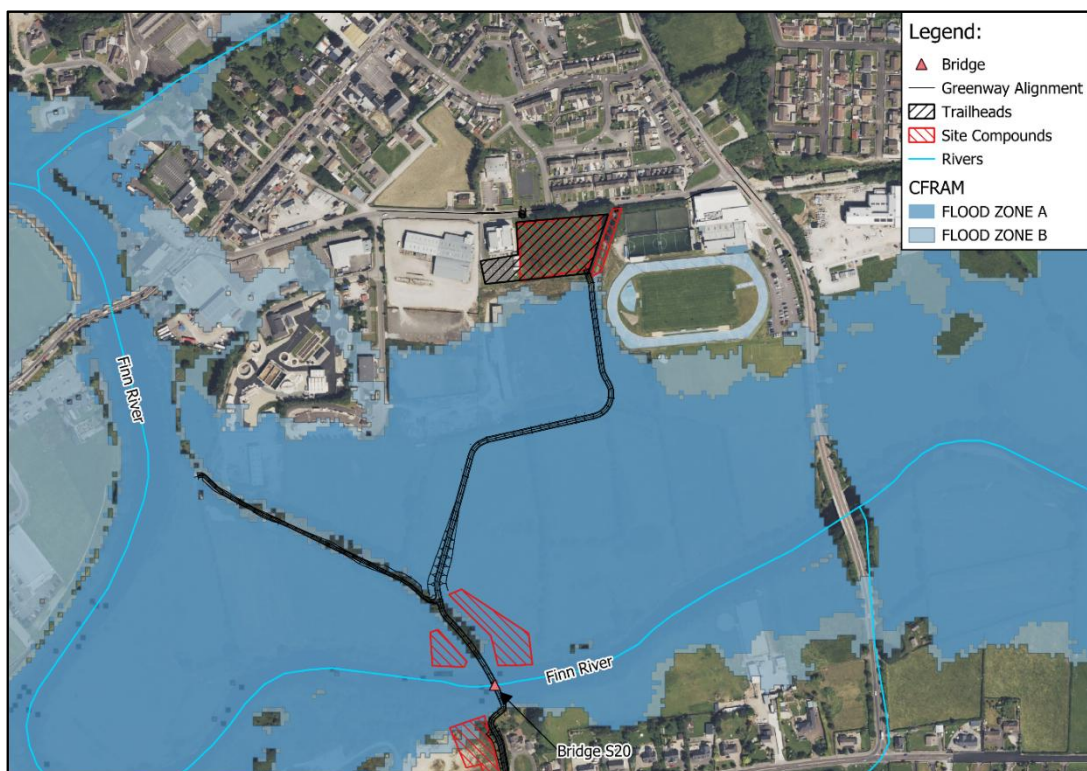


Figure 3-5 is required to connect the Trailhead to the online section of the Greenway on the rail line that runs to the northern bank of the Finn. The spur is located within the 1% AEP flood plain of the River Finn. **Error! Reference source not found.** The online section of Greenway is in Flood Zone C.

The spur is located wholly within the 1% AEP flood plain of the River Finn. It is recommended that to minimise impacts on floodplain storage the spur be constructed at grade using flood resilient permeable paving.

A new bridge deck will be constructed on the existing railway bridge piers (Figure 3-6) in the River Finn. The new bridge (see Section 3.3.2) will carry the Greenway over the Finn to maintain the connectivity of the Greenway.



Figure 3-6 - River Finn Railway Bridge piers

The area of the proposed Trailhead is identified as Opportunity Site 5 in the Ballybofey/Stranorlar LAP zoning maps (Donegal County Council, 2025). The Trailhead location is located outside of the 0.1% AEP under the OPW High End Future Scenario (HEFS).

A summary of the proposed development elements identified above, is presented in

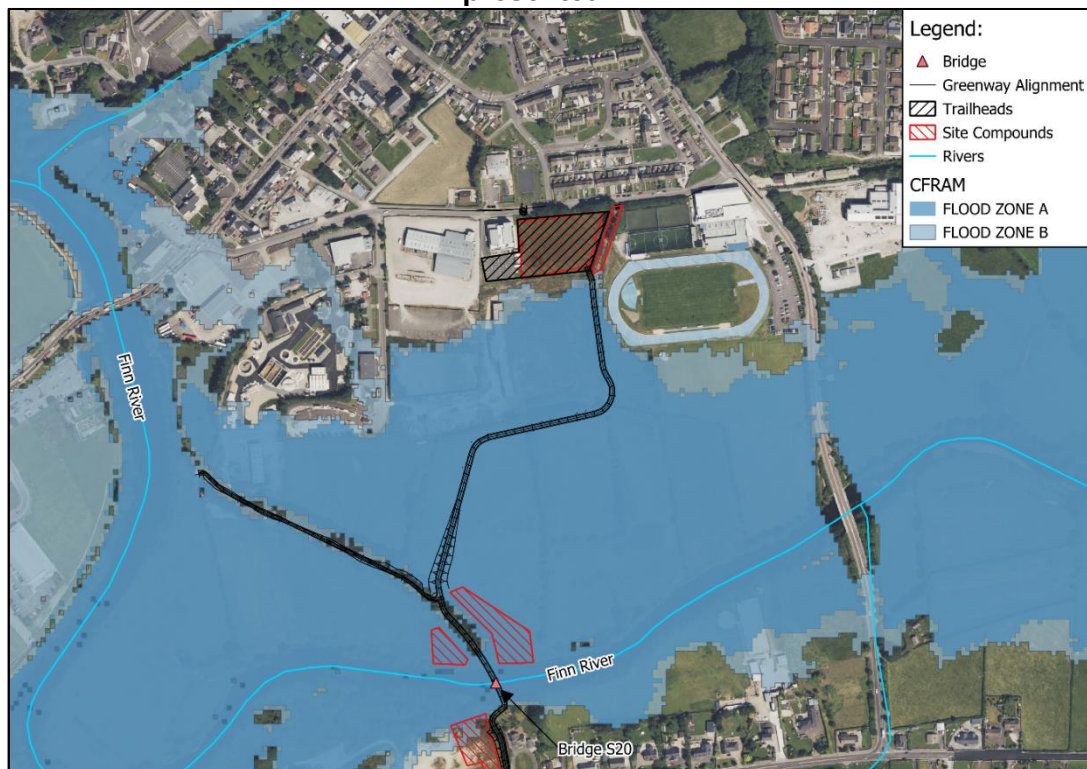


Figure 3-5. The flood vulnerability classification of each of the elements identified above have been assigned in accordance with the Guidelines (Table 2-2).

Table 3-6 - Ballybofey/Stranorlar Trailhead development element summary

Element	Description	Vulnerable class
Car park	Flood resilient construction	Less vulnerable
Offline Greenway	Local Transport Infrastructure	Less vulnerable
Online Greenway	Local Transport Infrastructure	Less vulnerable
Landscaping	Amenity open space	Water compatible
Bridge deck	Local Transport Infrastructure	Less Vulnerable
EV Charging Station	Utility	Highly Vulnerable

3.3 Structures

The Greenway will require the construction of new structures on the scheme. These include road underpasses, a road overbridge, 4 river bridges, and 10 minor drainage structures. In addition to the new bridges, a new bridge deck is proposed on the remnants of the River Finn Viaduct. The proposed drainage structures will comprise precast box or pipe culverts. The locations of these new structures relative to the Greenway route and flood extents are indicated in **Error! Reference source not found.**

The design of the Greenway seeks to maximise the use of existing infrastructure and there are several existing bridges and minor spanning structures (spans less than 2m) that will be incorporated into the scheme.

3.3.1 Existing Structures

These mostly consist of masonry arch bridges similar to the photograph in Figure 3-7 and stone clapper bridges on the rail line. The minor structures on the scheme are typically buried structures for drainage and do not require widening. Their original width was dictated by the geometric requirements of the railway line. All stone clapper bridges on the scheme are minor structures, whereas the masonry arch bridges on the scheme were a combination of drainage structures and railway over/underbridges.



Figure 3-7 - Masonry arch bridge at Lough Eske

No modifications to the existing structures will be undertaken under the proposed development. Repair works, typical of annual maintenance and asset management regimes will be undertaken as required. The objective of these repairs is to increase the residual design life of the structures to avoid requirements for future replacement works.

3.3.2 New Structures

The new structures on the scheme include 3 road underpasses on the N15 and N56 National Roads. Construction of a road overbridge is proposed to span the Trusk local road at Sessiagh View, to the south of Ballybofey. The overbridge will replace a derelict railway bridge.

Four river bridges are included within the proposed development.

1. A clear span 24m long structure will be constructed across the Lowerymore River at Biddy's O'Barnes, connecting the Trailhead with the online sections of the Greenway to the east of the river. No instream works will be required.
2. A clear span, 24m long structure will be constructed across the Clogher River. The bridge will carry the offline section of the Greenway that runs to the east of the St. Francis National School.
3. A 175m long, 6-span viaduct will be constructed across the Eske River. The bridge is located in a narrow, defined valley and will carry the offline section of the Greenway across the river to connect with the Lough Eske Trailhead to the south of the river. No instream works will be required; the internal bridge piers will be within the 1% AEP floodplain of the Eske.
4. A new bridge deck will be constructed on the railway bridge piers in the Finn river at Ballybofey/Stranorlar. The bridge deck will be 54m long and will utilise an existing northern abutment. The structural design of the bridge has been undertaken to minimise alterations to the geometry the existing piers. A section 50 consent has been submitted for the replacement bridge deck.



Figure 3-8 - New River Eske Crossing Location

The Greenway will require the construction of ten new minor drainage structures. These comprise box culverts on minor streams that have not been designated under the WFD, and some field ditches. The proposed new structures are summarised in Table 3-7.

Table 3-7 - Proposed new structures

Description	Type	Reference	Chainage (m)
N56 Underpass	Subway	S02	1100

Description	Type	Reference	Chainage (m)
Watercourse crossing	Culvert	PC07	2940
River Eske crossing	Bridge	S04	Lough Eske Loop West 55
Watercourse crossing	Culvert	PC08	4275
Clarlougheask - Carbbeagh	Culvert	PC09	4820
Watercourse crossing	Culvert	PC10	5330
Field Ditch	Culvert	PC11	6420
Watercourse crossing at St Francis'	Bridge	S06	6670
Watercourse crossing	Culvert	PC13	6800
Watercourse crossing	Culvert	PC14	6970
Watercourse crossing	Culvert	PC15	7220
N15 Underpass	Subway	S07	8220
Biddy's O'Barnes	Bridge	S10	12310
Sessiagh View Road crossing (west abutment existing)	Bridge	S17	27260
River Finn bridge (existing piers)	Bridge	S20	29470
Field Ditch	Culvert	PC03	Clar Link 350
N15 Underpass (Clar)	Subway	S03	Clar Link 800
Burn Daurnett Tributary	Culvert	PC17	25050

Section 50 Consent Applications have been submitted to the OPW for the new structures as required under the Arterial Drainage Act 1945. The Section 50 Consent Applications have been prepared by AECOM. The OPW have approved the Section 50 applications. The bridge soffit levels will be above the 1% AEP, including a 20% uplift due to Climate Change and an appropriate freeboard.

3.3.3 Rest Areas

The proposal includes rest areas along the Greenway route **Error! Reference source not found.** The rest areas are small areas of open amenity space comprising seating and bike parking. There are 21 Level 4 rest areas that provide bike parking and seating for 2 people along the route. There are also 3 Level 3 rest areas along the route. The Level 3 rest areas provide additional seating, bicycle parking, and picnic benches. All the rest areas have been classified as water compatible development in accordance the Guidelines (Table 2-2). The rest areas are located at a maximum spacing of 2 km where feasible. In areas of scenic beauty, they are proposed at more regular intervals. They have also been provided at locations where the Greenway user may need to exert more effort due to the vertical profile.

4. Flood Risk Assessment

4.1 Stage 1 Flood Risk Identification

The Stage 1 Flood Risk Identification includes a review of existing information on flood risk and the identification of any flooding or surface water management issues in the study area that may warrant further investigation.

For a flood risk to exist at a location, the three components of flood risk - the source of the hazard, the receptors affected by the hazard and the mechanism of transfer between the two - must all exist. The Guidelines recommend that the Source-Pathway-Receptor model be employed in implementing the sequential approach to Flood Risk Assessment.

4.1.1 Desk Study

A desk study was conducted to identify sources of flood risk information relevant to the proposed development. The sources of information summarised in Table 4-1 were consulted as part of the desk study. A hydrology walk over survey was conducted in August 2025 to supplement and verify the desk study findings.

The Directive 2007/EC/60 of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (the Floods directive) was transposed into Irish Law by SI No 122 of 2010 designated the OPW as the Competent Authority for the Floods Directive. During the first cycle of the Floods Directive the OPW undertook the Preliminary Flood Risk Assessment (PRFA), a national scale flood risk screening that was based upon readily accessible data.

The PRFA included analysis of historic floods, predictive analysis to assess areas prone to flooding, and consultation with local authorities and other government departments and agencies. The PRFA identified some 300 Areas for Further Assessment (AFA). The AFAs are communities, townlands or sites potentially subject to significant flood risk (The National CFRAM Programme, 2012) where further detailed assessments were justified.

National Indicative Fluvial Maps (NIFM) were created as part of the first cycle of the PRFA in 2012 by the OPW, using simple modelling techniques. The NIFM identify areas that may be subject to flood hazards from fluvial sources. They are not locally accurate but are appropriate for use in Stage 1 Flood Risk Identification to identify if proposed developments are adjacent to, or within, the modelled flood hazard areas and consequently should be subjected to more detailed flood risk assessment. NIFM are available for the 5%, 1% and 0.1 % AEP and are shown in purple within Figure 3-3, Figure 3-4 and Figure 4-3 to align with the NIFM extents shown in Floodinfo.ie and differentiate between the CFRAM flood maps.

A second-generation of NIFM maps covering approximately 27,000 km of river reaches that were not covered by hydraulic modelling under CFRAM were published by the OPW in 2020. The NIFM are based on predictive models, that show areas likely to be inundated by river flooding. The NIFM flood maps are suitable for use in a stage 1 Flood Risk Assessment to identify areas likely to be impacted by flooding.

Table 4-1 - Information Sources Consulted

Source	Data Gathered
Primary Sources of Baseline Data	
Catchment Flood Risk Assessment and Management Study (CFRAM): www.floodinfo.ie	Fluvial, Pluvial, Coastal flooding examined
National Indicative Fluvial Maps: www.floodinfo.ie	National Indicative Fluvial Maps examined
Historic Floods database available from Floodinfo.ie: www.floodinfo.ie	OPW Records of Fluvial, Pluvial, Coastal flooding examined

Source	Data Gathered
North Western-Neagh Bann CFRAM Study UoM 01 Hydrology Report www.floodinfo.ie	FEM FRAM Fluvial Maps consulted
Secondary Sources of Baseline Data	
Strategic Flood Risk Assessment (SFFRA) of the Donegal County Development Plan 2023-2029	Fluvial, Coastal and Pluvial flooding examined
Open Topographic Data Viewer	High resolution Lidar data used to perform terrain analysis within a GIS.
Geological Survey of Ireland (GSI) Maps	- GSI Teagasc subsoils map consulted to identify if alluvial sediments are shown to be present at development site that may indicate historic flooding
Geological Survey historical groundwater flooding maps	-Groundwater flood hazards -Groundwater flood data, -Ground water Karst Data
Historical Maps	OSI 25" mapping assessed

The OPW Flood Event Database has been interrogated to determine if there is a history of flooding along the Greenway route. There is a history of recurrent flooding from the Eske River affecting the area around the proposed Donegal Trailhead. Recurrent floods have been recorded at the Lowerymore River at the location of the Biddy's O'Barnes Trailhead. These floods are reported to have become less frequent following the construction of a replacement bridge upstream. There is a history of recurrent flooding from the Finn River at Dreenan Bridge, southeast of the proposed Trailhead location.

A recurrent flood event along the proposed route was reported by a member of the public during the non-statutory consultative processes undertaken by the project. The location was visited during a walkover survey undertaken in August 2025. The flooding occurs at a small culvert that carries a private access road across a small ephemeral stream draining a small glen. The channel upstream and downstream of the culvert is heavily overgrown. Based on the survey and interviews with local residents it was concluded that the source of flooding at the location is pluvial. The proposed development will not be impacted by this flood mechanism.

A review of the Historical Groundwater Flood maps and Predictive Groundwater Flood Extent maps (Geological survey Ireland, 2024) indicate that groundwater flooding is not a likely source of flooding along the route.

The limit of coastal flood impacts coincides with the bridge on the Eske River at Bridge Street, to the south of the proposed Trailhead (RPS Group, 2017). Based on the desk study, it is concluded that fluvial flooding is the sole significant source of flood risk to the proposed development.

Flood risk within the study area is influenced by fluvial, pluvial, and localised overland flow processes. Fluvial flood risk is associated with the main river channels and their tributaries, with flood extents defined by channel capacity, topography, and upstream catchment response. Existing flood mapping published by the Office of Public Works indicates that areas of fluvial flood risk are largely confined to low-lying valley floors adjacent to the principal watercourses. Pluvial flood risk arises from intense rainfall exceeding the capacity of drainage pathways and infiltration rates, resulting in localised surface water ponding and overland flow. These effects are primarily influenced by topography, soil conditions, and land cover, and are generally limited in extent within the predominantly rural catchment. Groundwater flood risk is low, reflecting the absence of known groundwater flooding mechanisms and the hydrogeological characteristics of the area. Overall, baseline flood risk within the study area is characterised by localised fluvial floodplains associated with river channels and limited pluvial risk, with no evidence of widespread or significant flood risk constraints outside of mapped flood extents.

4.2 Stage 1 Fluvial Flood Risk Assessment

There is flood risk mapping available for the entire Greenway route (Appendix C). The CFRAM programme produced flood risk maps for Donegal Town (chainage 0) that extend to approximately chainage 2000. CFRAM flood risk maps are available at the terminal Trailhead at Ballybofey/Stranorlar (chainage 30050). The extent of the CFRAM mapping is shown in Appendix C. Intermediate sections of the Greenway and Trailheads are covered by NIFM flood risk maps.

High resolution LiDAR data is available for the entire route. The Fluvial Flood Risk maps (Figure 3-2, Figure 3-3, Figure 3-4 and

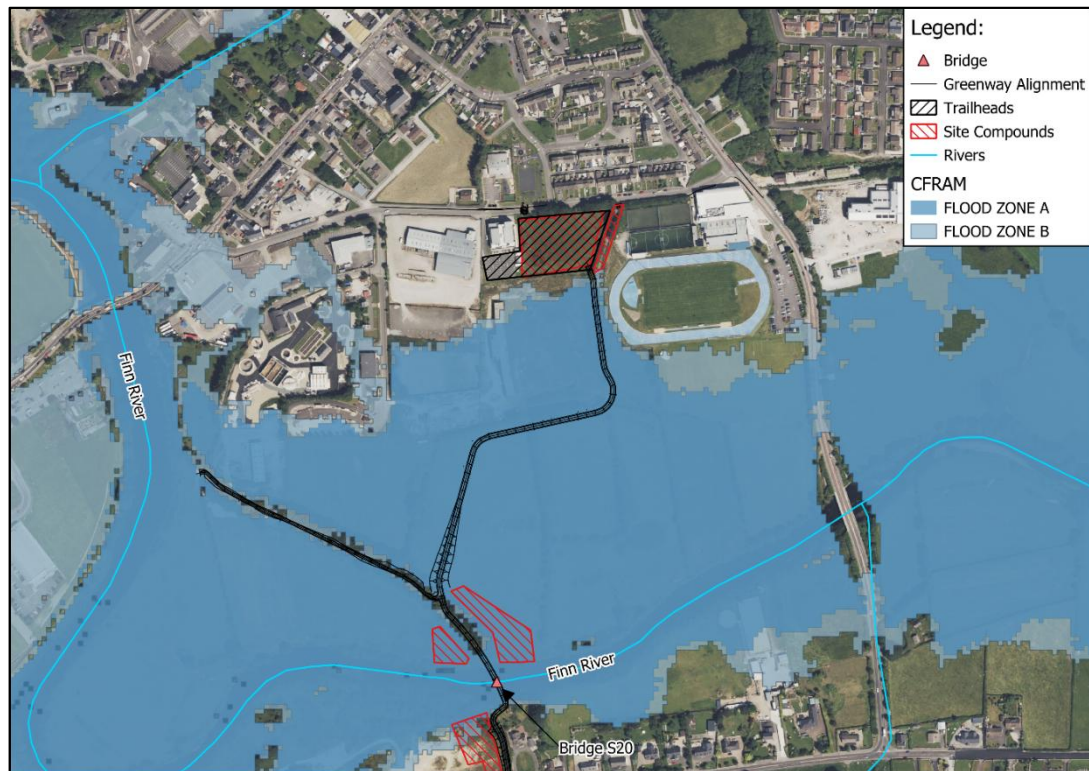


Figure 3-5) and the LiDAR data have been used to establish the Fluvial Flood Zones (FFZ) as defined in Table 2-1 for the proposed development elements identified in Section 3.2. A Flood Risk Assessment for each element has been completed by applying the matrix within Table 2-3 according to the Guidelines.

4.3 Trailhead Stage 1 Flood Risk Assessment.

Based on Figure 3-3 it is concluded that the proposed Lough Eske Trailhead is located within Flood Zone C. The available fluvial flood risk information is determined to be adequate at this location, given the separation from the NIFM flood extents and topography.

Fluvial flood mapping at the Trailheads at Donegal (Figure 3-2), Biddy's O'Barnes (Figure 3-4) and Ballybofey/Stranorlar (

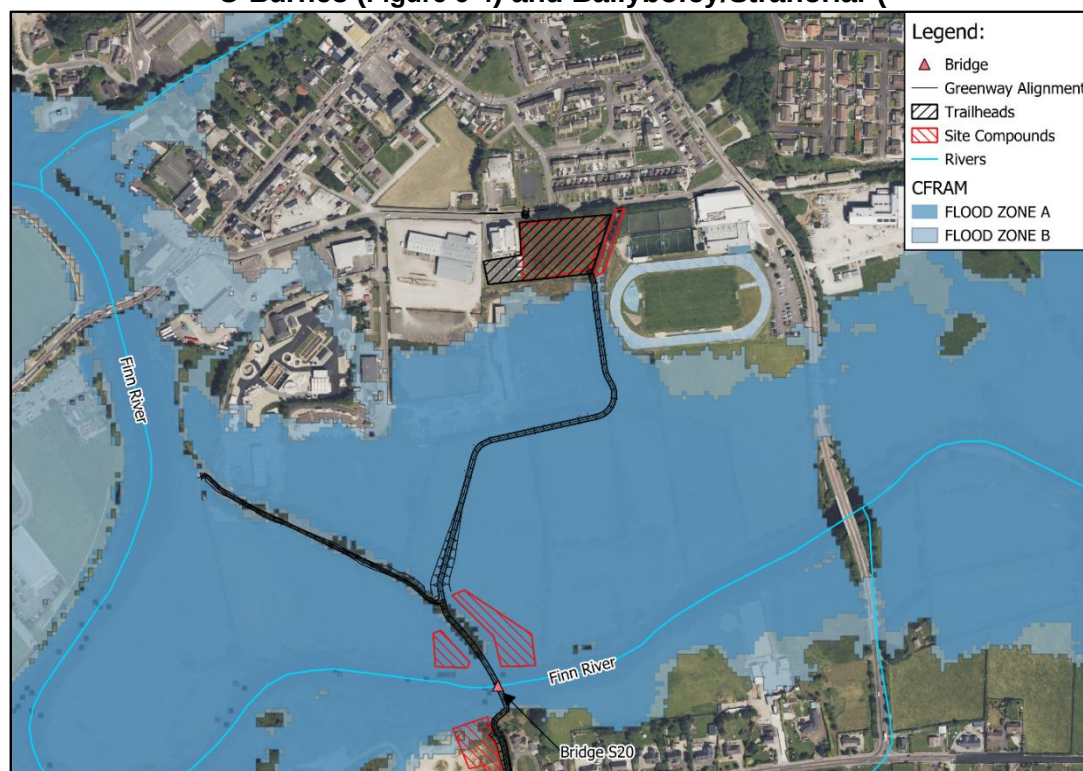


Figure 3-5) indicate that these Trailheads are at risk of fluvial flooding and require a more detailed Stage 1 assessment. The results of these assessments are presented below.

4.3.1 Donegal Town Trailhead Fluvial Flood Risk Assessment

The CFRAM flood extent maps indicate the proposed Trailhead in Donegal town is located within Flood Zone A (Figure 3-2). The CFRAM mapping is considered an appropriate basis upon which to assign Fluvial Flood Zones (FFZ) in this area. The outcome of the Flood Risk Assessment is presented in Table 4-2.

Table 4-2 - Donegal Town Trailhead Stage 1 Flood Risk Assessment

Element	FFZ	Vulnerability Class	Assessment
Car park extension	A	Less vulnerable	Justification Test
Modified junction	A	Less vulnerable	Justification Test
Railway road realignment	A	Less Vulnerable	Justification Test
Offline Greenway	A	Less vulnerable	Justification Test
Landscaping	A	Water compatible	Appropriate
EV Charging Station	A	Highly Vulnerable	Justification Test
Existing car park SuDS	A	Water compatible	Appropriate

The closest CFRAM node to the proposed Trailhead is located approximately 30 m north, upstream of the Eske River, identified as Node ID 0104M000044I. The estimated 1% AEP flood depth at this node is 7.28 mAOD, and the 0.1% AEP level is (7.31 mAOD). The Guidelines allow for the 0.1% AEP extent to be used as a proxy indicator of the MRFS fluvial flood extents.

The conclusion of the Stage 1 Flood Risk Assessment for the Donegal Trailhead is that the CFRAM flood information is adequate to assess flood risk at the location.

The location is within the 1% AEP flood plain of the Eske River. It is recommended that these elements be constructed using Flood Resilient construction techniques at grade. A Justification test is required to determine the appropriateness of the proposed development at this location, and a Stage 2 Flood Risk Assessment is required.

4.3.2 Biddy's O'Barnes Stage 1 Fluvial Flood Risk Assessment

The NIFM flood risk maps indicate that the proposed Trailhead Location is adjacent to the 1% AEP floodplain of the Lowerymore River. The NIFM maps indicate that the lowest elevation of the proposed carpark (85.02 mAOD) is in Flood Zone C.

The NIFM information does not provide flood depth information. Local members of the public were interviewed during the hydrology walkover survey undertaken in August 2025 to establish the flood history at the location. The interviews corroborate the NIFM flood risk map extents for the location. The available evidence suggests that the NIFM maps for the area are sufficiently reliable to assign the FFZ for the development elements given the relatively minor consequences of a flood event in the area. The FFZ of the bridge has been assigned based on the soffit levels of the bridge being above the 1% AEP, including an allowance for a 20% uplift due to Climate Change and an appropriate freeboard allowance, to comply with the Section 50 consent requirements.

The outcome of the flood risk assessment is presented in Table 4-3.

Table 4-3 - Biddy's O'Barnes Trailhead Fluvial Flood Risk Assessment

Element	FFZ	Vulnerability Class	Assessment
Car park	C	Less vulnerable	Appropriate
Online Greenway	C	Less vulnerable	Appropriate
Offline Greenway	B	Less vulnerable	Appropriate
Landscaping	B	Water compatible	Appropriate
Bridge	C	Less vulnerable	Appropriate
EV Charging Station	C	Highly vulnerable	Appropriate

Given the inherent uncertainty in the NIFM it is recommended that the Precautionary Principal be adopted in the construction of the Trailhead at this location. Specific recommendations are as follows:

1. The design flood level of the carpark should be set at 86.02 mAOD. This is the level of the existing carpark. Local knowledge and the NIFM indicate that this lies above historic flood levels at the location.
2. The car park and the Greenway should be constructed using flood resilient techniques as detailed within Chapter 4 of the Environmental Impact Assessment Report (EIAR). The car park will be constructed from permeable, flood resilient materials such as Grasscrete or similar porous paving, and the Greenway will be surfaced in permeable flexible asphalt.

The conclusion of the Stage 1 Flood Risk Assessment is that the Trailhead is an appropriate development at this location. A Justification Test is required for the new proposed road alignment and the new Trailhead elements.

4.3.3 Stranorlar/Ballybofey Trailhead Stage 1 Fluvial Flood Risk Assessment

The CFRAM flood extent maps indicate that the proposed Trailhead in Ballbofey/Stranorlar town is located within Flood Zone C. The CFRAM mapping is considered an appropriate basis upon which to assign the FFZ in this area. The FFZ of the bridge has been assigned based on the soffit levels of the bridge being above the 1% AEP, including an allowance for a 20% uplift due to Climate Change and an appropriate freeboard allowance, to comply with the Section 50 consent requirements.

The outcome of the flood risk assessment is presented in Table 4-4.

Table 4-4 - Ballybofey/Stranorlar Trail Fluvial Flood Risk Assessment

Element	FFZ	Vulnerability Class	Assessment
Car park	C	Less vulnerable	Appropriate
Offline Greenway	A	Less vulnerable	Justification Test
Online Greenway	C	Less vulnerable	Appropriate
Landscaping	C	Water compatible	Appropriate
Bridge deck	C	Less vulnerable	Appropriate
EV Charging Station	C	Highly vulnerable	Appropriate

The Stage 1 Flood Risk Assessment concludes that the CFRAM flood risk maps are an appropriate basis upon which to assign FFZ in this area. The required spur between the online section and the rail line is in the 1% AEP floodplain of the River Finn. Therefore, under the Guidelines, a Justification Test is required to determine the appropriateness of the proposed offline Greenway.

4.4 New Structures Stage 1 Flood Risk Assessment

Fluvial Flood Zones have been assigned to each of the proposed new structures based on the flood risk maps in Appendix C. The structures are classified as less vulnerable developments. The results of the Stage 1 Flood Risk Assessment are presented in Table 4-5.

Table 4-5 - New structures Stage 1 Flood Risk Assessment

Description	Type	Reference	Assessment	FFZ
Water Course	Culvert	PC07	Appropriate	C
N56 Underpass	Subway	S02	Assessment	C
River Eske	Bridge	S04	Appropriate	C
Watercourse crossing	Culvert	PC08	Appropriate	C
Clarlougheask-Carbbeagh	Culvert	PC09	Appropriate	C
Watercourse Crossing	Culvert	PC10	Appropriate	C
Field Ditch	Culvert	PC11	Appropriate	B
St Francis School	Bridge	S06	Appropriate	C
Water course Crossing	Culvert	PC13	Appropriate	C
Water course Crossing	Culvert	PC14	Appropriate	C
Water Course Crossing	Culvert	PC15	Appropriate	C
N15 Underpass	Subway	S07	Appropriate	C
Biddy's O'Barnes	Bridge	S10	Appropriate	C
Sessiagh View	Bridge	S17	Appropriate	C
River Finn Bridge	Bridge	S20	Appropriate	C
Field Ditch	Culvert	PC03	Appropriate	C

Description	Type	Reference	Assessment	FFZ
N15 Underpass	Subway	S03	Appropriate	C
Burn Durnett Tributary	Culvert	PC17	Appropriate	C

Table 4-5 indicates that the proposed new structures are appropriate developments at their locations.

Section 50 Applications accompanied by appropriate hydraulic analysis have been submitted to the OPW for the new structures as required under the Arterial Drainage Act 1945 as amended in accordance with the Guidelines.

The proposed underpass locations are in Flood Zone C and the FRA confirms the sites are not at risk of flooding. Therefore, no interaction between flood waters and carriageway or user safety is anticipated. The proposed drainage design has been developed in accordance with TII standards and incorporates appropriate capacity, gradients, and collection systems, no further mitigation is required.

The proposed underpass locations represent localised low points; however, given the compliant drainage design and limited contributing catchments, the likelihood of significant ponding is low.

In exceedance events, overland flow pathways are limited and are not expected to give rise to significant hazards. While localised ponding may occur under extreme events or system surcharge, the scale and depth of flooding is not expected to pose a significant safety risk to users. No significant residual flood risk to the safety or operation of the proposed development associated with the underpasses has been identified.

4.5 Rest Areas Stage 1 Flood Risk Assessment

Fluvial Flood Zones have been assigned to each of the proposed rest areas based on the flood risk maps in Appendix C **Error! Reference source not found..** The results of the Stage 1 Flood Risk Assessment are presented in Table 4-6. The rest areas are considered water compatible developments.

Table 4-6 - Rest Area stage 1 Flood Risk Assessment

ID	Vulnerability	FFZ	Chainage	Assessment
1	Water Compatible	C	28250	Appropriate
2	Water Compatible	C	26720	Appropriate
3	Water Compatible	C	25450	Appropriate
4	Water Compatible	C	23740	Appropriate
5	Water Compatible	C	150 Golland Link	Appropriate
6	Water Compatible	C	23100	Appropriate
7	Water Compatible	C	22500	Appropriate
8	Water Compatible	C	20500	Appropriate
9	Water Compatible	C	19900	Appropriate
10	Water Compatible	C	19380	Appropriate
11	Water Compatible	C	18000	Appropriate
12	Water Compatible	C	15980	Appropriate
13	Water Compatible	C	14010	Appropriate
14	Water Compatible	C	13530	Appropriate
15	Water Compatible	C	11700	Appropriate

ID	Vulnerability	FFZ	Chainage	Assessment
16	Water Compatible	C	9920	Appropriate
17	Water Compatible	C	8500	Appropriate
18	Water Compatible	B	3050 Eske Loop	Appropriate
19	Water Compatible	C	2270 Eske Loop	Appropriate
20	Water Compatible	C	4200	Appropriate
21	Water Compatible	C	3820	Appropriate
22	Water Compatible	C	3520	Appropriate
23	Water Compatible	C	2420	Appropriate
24	Water Compatible	C	1900	Appropriate

Table 4-6 indicates that the proposed rest areas are appropriate developments at their locations.

4.6 Alignment Stage 1 Flood Risk Assessment

The Greenway is classified as less vulnerable development in accordance with current Transport Infrastructure Ireland (TII) Standards (Transport Infrastructure Ireland, 2022).

The online sections are assigned to FFZ C based on the flood risk mapping (Appendix C **Error! Reference source not found.**) and the elevation of the embankment. The available mapping is assessed as being an appropriate basis upon which to assign FFZ for the online sections.

The offline sections of the Greenway are considered new development and are subject to the sequential approach and the Justification Test. Most of the offline sections are assigned to FFZ C. Sections at Donegal Town and Ballybofey Stranorlar in Flood Zone A were identified as requiring a Justification Test and Stage 2 Flood Risk Assessment for the associated Trailheads. Examination of the flood risk map revealed two additional significant offline sections that traverse Flood Zone's A and B: These are

1. Sessiagh View,
2. St. Francis National School.

4.6.1 Sessiagh View

A flood risk map of the Sessiagh View area is in shown in

Figure 4-1. The Greenway at this location comprises an approximately 250m long section on the mainline passing through Flood Zone A and Flood Zone B. There is an approximately 150 m long spur to the northwest, passing through FFZ A and B here. There are no CFRAM estimation nodes within proximity of the proposed development.

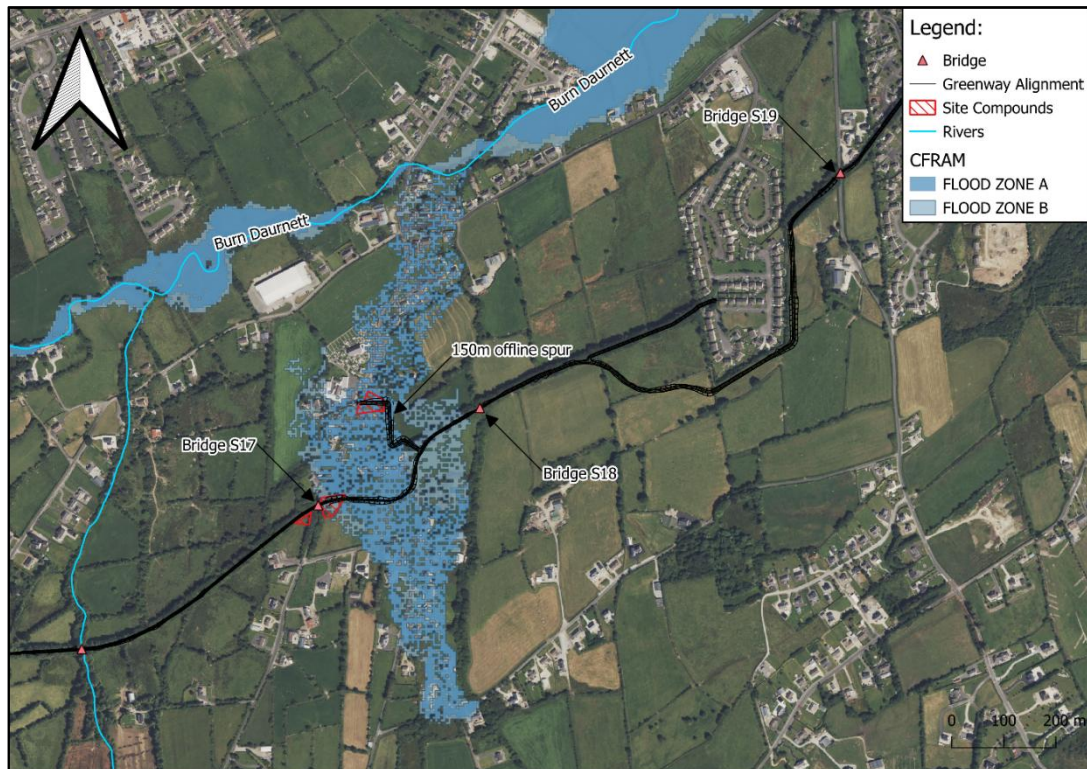


Figure 4-1 - Sessiagh View Fluvial Flood Risk Map

Flood risk maps produced by the Ballybofey/Stranorlar FRS show a similar pattern of overland flow (Arcadis ByrneLooby, 2025) to the CFRAM model in their pre-development scenario model.

The Sessiagh watercourse is not included on the EPA River Network. A review of the Ballybofey/Stranorlar FRS hydraulics report confirms that there are no Flood Studies Update (FSU) estimation nodes on the watercourse (ARCADIS ByrneLooby). The OPW Historic Flood Database does not include recorded flood events within the indicated CFRAM floodplain area. The FRS hydrology report conducted an independent review of historic flood events based on Public Consultation, determined that there are no recorded flood events in the area (ARCADIS ByrneLooby).

The FRS hydraulics report (Arcadis ByrneLooby, 2025) describe the flooding at Sessiagh as being initiated at a bridge on Coach Road, approximately 600 m south of the proposed Greenway spur. Flooding at the bridge is caused by an upstream pipe drain which causes water to back up in the Sessiagh Stream. This causes out of bank flow at the bridge which then flows overland, towards the Greenway spur. The FRS hydraulics report indicates that depths in the upstream overland flow path in the undefended scenario are less than 50 mm (Arcadis ByrneLooby, 2025). The modelled flood depths at the proposed Farm Spur have been confirmed as being less than 50mm. It is concluded that the function of the floodplain indicated by the CFRAM and FRS model is principally one of conveyance rather than storage.

The FRS is at the options selection stage. The FRS proposes to instal a flap valve on the pipe to prevent out of bank flows (ayesa ARCADIS, 2025). The predicted 1% AEP extent in the defended scenario is shown in Figure 4-2. In the defended scenario the flooding in the Sessiagh watercourse is contained within the narrow riparian zone, without the need for further mitigation measures. T herefore, upon clompletion of the FRS, the mainline Greenway and the spur at Sessiagh View are within Flood Zone C. Nonetheless, to address the residual risk, the Greenway shall incorporate an interceptor drain that will return overland flow to the Sessiagh stream, in the unlikely event of a failure of the flood risk management measures proposed in the FRS, without increasing the risk of flooding upstream or downstream.



Figure 4-2 - Proposed Flood Prevention measures at Coach Road Bridge (Adapted from (ayesa ARCADIS, 2025))

The land use in the area is mainly rural with some one-off housing development. The location is designated as an Established Development 2 Zone in the Ballybofey/Stranorlar LAP (Donegal County Council, 2025).

Application of the Source-Pathway-Receptor model using the FRS model demonstrates that construction of the Greenway at this location with the interceptor drain to mitigate potential overland flows will not increase flood risk upstream or downstream.

The FRA concludes that the flood mechanism hypothesised by the FRS is a plausible explanation of the source of potential flooding at the proposed Greenway spurs, and that the modelled flood depths and extents are sufficient to quantify the impacts of the proposed development on flood risk in the area. Under the Guidelines the loop and spur sections at this location are required to satisfy the Justification Test.

4.6.2 St. Francis' National School

A flood risk map for the area surrounding St. Francis' National School is shown in Figure 4-3. The offline Greenway to the west of the school passes through an area of wet woodland as it heads northwest. The school is at an approximate elevation of 40 mAOD and sits on made ground elevated approximately 0.75-1 m above the bed of the stream to the north and south. The local road to the north of the school is at an elevation of approximately 35 mAOD. It has a steep gradient to the west, where it is carried over the Lowerymore River by a masonry arch bridge. Drainage in the area flows towards Lough Eske which occupies a topographical depression. To the north of the road, lies an area of wet woodland that occupies the floor of a narrow glen. The stream to the north of the road was surveyed during the hydrology walkover survey in August 2025. The stream has a steep gradient; its depth is controlled by a bedrock bed. Based on the flood risk mapping and the topography of the area, there is no pathway to flood sensitive receptors at the location of the offline sections. The NIFM flood risk maps are assessed as being sufficient to establish the FFZ at the location given the minor consequences of a flood in the area.

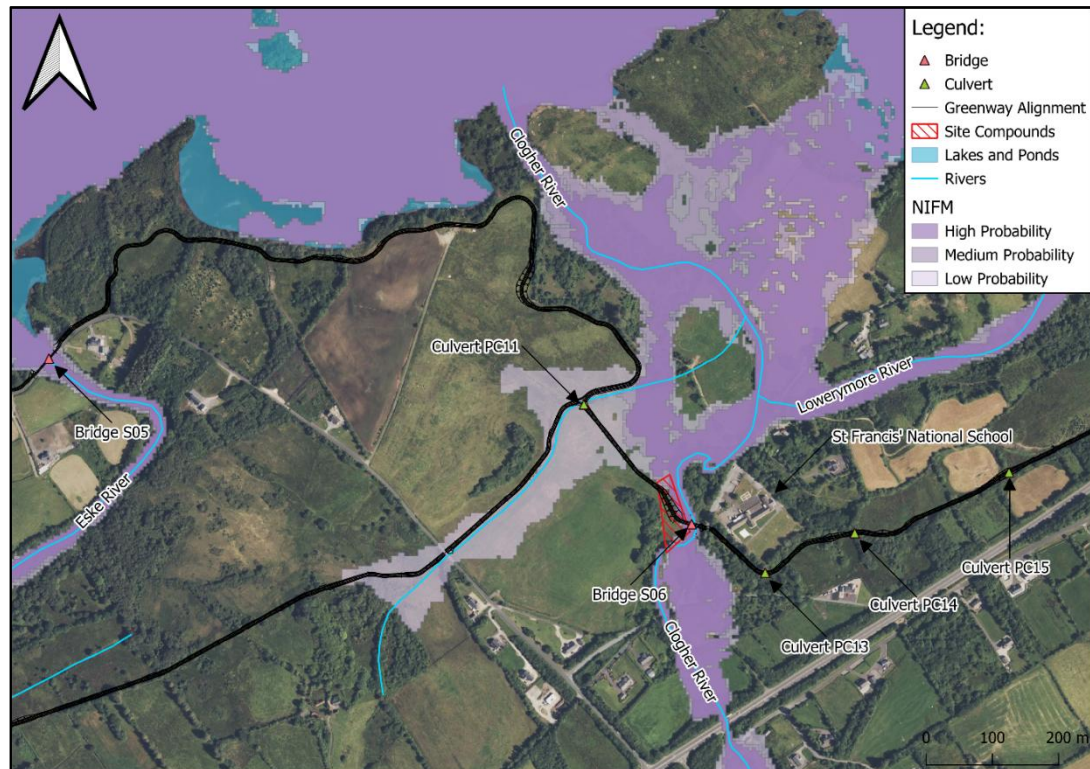


Figure 4-3 - St Francis National School area Fluvial Flood Risk Map.

The area is rural and is not subject to development zoning policy. Under the Guidelines the loop and spur sections are required to pass a Justifications Test.

4.7 Stage I Flood Risk Identification Conclusions

The available flood risk mapping from CFRAM, the Ballybofey/Stranorlar FRS and the NIFM projects is considered an appropriate basis to assign FFZs for the proposed development.

Stage 2 Flood Risk Assessment and Justification Tests are required for the proposed elements listed below:

1. The Donegal Trailhead,
2. The offline spur between the railway embankment and the Stranorlar Trailhead,
3. The offline Greenway sections at Sessiagh View (
4. Figure 4-1),
5. The offline Greenway sections at St. Francis School. (Figure 4-3).

4.8 Stage 2 Initial Flood Risk Assessment

Where a planning authority is considering proposals for new development in areas at a high or moderate risk of flooding that include types of development that are vulnerable to flooding and that would generally be inappropriate as set out in Table 3.2, the planning authority must be satisfied that the development satisfies all of the criteria of the Justification Test as it applies to development management as outlined in Box 5.1: Justification Test for development management in the Guidelines (OPW, 2009). The required Stage 2 assessments and Justification Tests identified in the Stage 1 Flood Risk Assessment are presented in the following sections.

4.8.1 Donegal Trailhead Stage 2 Flood Risk Assessment

The source of flood risk at Donegal Town is confirmed as fluvial flooding. CFRAM flood levels have been shown to be appropriate to establish design flood levels. The development location is in Flood Zone A and B. The Trailhead is proposed to be constructed above the 1% AEP fluvial flood level, placing it in Flood Zone C during operation. Therefore, the Stage 2 Flood Risk Assessment is satisfied, and a Justification Test is required under the Guidelines to demonstrate that the proposed development is appropriate at the location.

The proposed junction modification and road realignment at the Donegal Trailhead will require Cut and Fill operations that will impact the existing amenity grassland to the north of the community centre. A level-for-level analysis of the required Cut and Fill analysis has been completed in Civil 3D to determine the impacts of the proposal upon floodplain storage at the location (refer to Figure 4-4).

This analysis shows that the cut volume exceeds that of the fill volume, indicating that the proposed realignment will result in an increase in floodplain storage at the Trailhead location (Table 4-7 **Error! Reference source not found.**). High-resolution LiDAR has been reviewed as part of the Flood Risk Assessment, and it has been concluded that the proposed road realignment will not block or divert overland flow paths in the area.

Table 4-7 - Donegal Trailhead realignment Level for level cut and fill analysis summary

Area m ²	Cut volume m ³	Fill volume m ³	Balance m ³
2329.3	-189.6	+135.3	-54.3

To minimise impacts on floodplain storage, the car park extension and the offline Greenway section (approximate chainage 100-200 m) will be constructed at grade, using flood resilient permeable paving. The existing hardstanding at the St. John Bosco Centre carpark will be retained with improved drainage that will incorporate SuDS such as swales and tree planters where feasible.

The road realignment and increased carparking spaces will not significantly increase existing areas of hardstanding at the Trailhead location. Pluvial flood risk will be addressed by improvements to the existing surface water drainage network and the incorporation of SuDS into the drainage design. The cut and fill calculations undertaken for the road works used the 0.1% AEP depth as the level for the cut and fill calculations to account for climate change.



Figure 4-4 - Donegal Trailhead Cut & Fill Analysis

4.8.1.1 Donegal Town Trailhead Justification Test.

The requirement for a justification for the Donegal Town Trailhead is established in Table 3-3. The criteria for the Justification Test are adapted from the Guidelines as headings in bold, with responses below.

Criterion 1: The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.

The location is designated as Opportunity Site 5 under the Seven Strategic Towns LAP. Opportunity Sites are defined as locations within or adjacent to a town centre or other strategic area that has been identified for its potential to contribute significantly to the regeneration, development, or enhancement of the town. Opportunity Site 5 covers approximately 1.8 hectares. The proposal to provide additional car parking spaces at this location is consistent with the objective of supporting town centre functionality espoused in the LAP. The additional car parking spaces are critical to achieving the objectives of the Greenway. The LAP states that less vulnerable development is permissible within the Opportunity Site. The proposed EV charging stations shall be elevated above the 0.1% AEP level of 3.71 mAOD. Criterion 1 is assessed as being satisfied for the proposed car park extension, road realignment and offline Greenway on the basis that the EV charging stations are raised above the 0.1% AEP level.

Criterion 2: The proposal has been subject to an appropriate flood risk assessment that demonstrates:

Criterion 2 (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;

Cut and Fill calculations for the proposed road realignment and junction modification show that these will result in a modest increase in floodplain storage in the area, contributing to a commensurate reduction in flood risk locally. There will not be a significant impact on overland flow paths in the area. Criterion 2 (i) is assessed as being satisfied.

Criterion 2 (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible.

Construction methods have been selected to minimise impacts on local flood mechanisms. The proposed land use is consistent with existing land use and existing flood mitigation measures are sufficient to maintain the consequences of a flood event at current levels. Criterion 2 (ii) is assessed as being satisfied.

Criterion 2 (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access;

The proposed development will not impact existing flood protection measures. Given its limited extent and flood resilient construction, it will not significantly impact the design, implementation and funding of future flood risk management measures. Criterion 2 (iii) is assessed being satisfied

Criterion 2 (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The proposal will result in an increase in recreational space at the location and will contribute to the LAP's objective to reduce on street parking. Criterion 2 (iv) is assessed as being satisfied.

The proposal satisfies the criteria of the Justification Test. It is concluded that on the basis that the EV charging stations are elevated above the 0.1% AEP level, the proposed development at the Donegal Trailhead is appropriate under the Guidelines.

4.8.2 Ballybofey/Stranorlar Trailhead Justification Test

The requirement for a justification for the Trailhead is established in Table 4-4.

Criterion 1: The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.

The location is designated as Opportunity Site 5 in the Ballybofey/Stranorlar LAP zoning maps (Donegal County Council, 2025). The offline section of the Greenway is in an area designated as an open space and recreation zone. Criterion 1 is assessed as being satisfied.

Criterion 2: The proposal has been subject to an appropriate flood risk assessment that demonstrates:

Criterion 2 (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;

The proposed Greenway shall be constructed at grade of flood resilient construction. There will be no loss of floodplain storage. Based upon topographic analysis and a walk over survey, it is concluded that the Greenway will not impact surface drainage pathways. Criterion 2 (i) is assessed as being satisfied.

Criterion 2 (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible.

The selection of construction methods has been made to minimise impacts on local flood mechanisms. The proposed land use is consistent with existing land use and will not result in the generation of significant run-off that could cause negative environmental effects. Criterion 2 (ii) is assessed as being satisfied.

Criterion 2 (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access;

The proposed development will not impact existing flood protection measures and will not significantly impact the design, implementation and funding of future flood risk management measures. Criterion 2 (iii) is assessed as being satisfied.

Criterion 2 (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The proposal will result in an increase in recreational space at the location and will contribute to the LAP's objective to reduce on street parking. Criterion 2 (iv) is assessed as being satisfied.

The proposal satisfies the criteria of the Justification Test. It is concluded that the proposed development of an offline Greenway spur to the Ballybofey/Stranorlar Trailhead is appropriate under the Guidelines provided that the construction is carried out at grade.

4.8.3 Sessiagh View Offline Greenway Justification Test

Criterion 1: The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.

The location is designated as an Established Development 2 Zone under the Ballybofey/Stranorlar LAP zoning maps (Donegal County Council, 2025). This zoning designation is for areas adjacent to urban cores that are suitable for sustained urban consolidation. Greenways are proposed within the LAP as a means of urban revitalisation. Criterion 1 is assessed as being satisfied.

Criterion 2: The proposal has been subject to an appropriate flood risk assessment that demonstrates:

Criterion 2 (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;

The offline sections intersect an overland flow path that will be eliminated by the Ballybofey/Stranorlar FRS. In the defended scenario, the offline sections are located within Flood Zone C. Nonetheless, the Greenway shall incorporate an interceptor drain that will return overland flows to the Sessiagh stream without increasing the risk of flooding upstream or downstream. This is supported by the findings of the hydraulic modelling undertaken for the FRS, as discussed in Section 4.10 above. Criterion 2 (i) is assessed as being satisfied.

Criterion 2 (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible.

The proposed interceptor drain will return any overland flow to the watercourse and will reduce flood risk to properties in the area in the event of a failure in the FRS measures. Criterion 2 (ii) is assessed as being satisfied.

Criterion 2 (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access.

Consultations with the OPW and Donegal County Council on the proposed FRS indicate that the proposed construction is complimentary to the FRS and will eliminate residual risk in the area in the event of a failure of the FRS measures. Criterion 2 (iii) is assessed as being satisfied.

Criterion 2 (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The Greenway will contribute to aims in the Donegal Development Plan 2024-2030 (Donegal County Council, 2025) to develop a network of high-quality greenways countywide to support climate action, enhance economic development, promote public health, and improve recreation amenities and establish sustainable transport connections to scenic areas. The proposed Greenway at this location contributes to this aim. Criterion 2 (iv) is assessed as being satisfied.

Therefore, the proposed development of an offline Greenway at Sessiagh View satisfies the requirements of the Justification Test. It is concluded that the proposed development at this location is appropriate under the Guidelines.

4.8.4 St. Francis School offline Greenway Justification Test.

Criterion 1: The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.

The location is rural and is not subject to specific zoning policies. The Donegal Development Plan 2024-2030 (Donegal County Council, 2025) aims to develop a network of high-quality greenways countywide to support climate action, enhance economic development, promote public health, and improve recreation amenities and establish sustainable transport connections to scenic areas. The proposed Greenway at this location contributes to this aim. Criterion 1 is assessed as being met.

Criterion 2: The proposal has been subject to an appropriate flood risk assessment that demonstrates:

Criterion 2 (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;

The modest section of Greenway, proposed within Flood Zones A and B in this area shall be constructed 'at grade' and shall include flood resilient techniques, ensuring no loss of floodplain storage. These sections will have minimal impact on surface flow paths which predominantly consist of defined field drainage channels. Given the topography in the area,

there are no vulnerable receptors identified that will be impacted by the offline sections so flood risk in the area will not be increased. Criterion 2 (i) is assessed as being satisfied.

Criterion 2 (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible.

The Greenway will be lightly trafficked and will not significantly increase exposure to flood risk in the area. It will not generate significant volumes of surface water run-off or introduce sources of pollution into the area. Criterion 2 (ii) is assessed as being satisfied.

Criterion 2 (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access.

The proposed development will not impact existing flood protection measures. As the location is sparsely populated it is unlikely that flood risk management measures will be undertaken in future. Criterion 2 (iii) is assessed as being satisfied

Criterion 2 (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The Greenway will contribute to aims in the Donegal Development Plan 2024-2030 (Donegal County Council, 2025) to develop a network of high-quality greenways countywide to support climate action, enhance economic development, promote public health, and improve recreation amenities and establish sustainable transport connections to scenic areas. The proposed Greenway at this location contributes to this aim. Criterion 2 (iv) is assessed as being satisfied.

The proposal for the construction of the offline Greenway section at St. Francis National School satisfies all the criteria of the Justification Test. It is concluded that the proposed development at this location is appropriate under the Guidelines.

5. Flood Risk Assessment Conclusions

A Stage 1 and Stage 2 Flood Risk Assessment has been conducted for the proposed development. At locations where Fluvial Flood Risk were identified as significant arising from the Stage 1 Flood Risk Identification process, a Stage 2 Initial Flood Risk Assessment was undertaken, and the Justification Test was applied. The outcomes of the Justification Test are summarised in Table 5-1.

Table 5-1 - Justification Test results

Proposal Element	Justification Test	Condition
Donegal Trailhead	Satisfied	No loss of floodplain – Greenway constructed ‘at grade’ of flood resilient construction. EV Charging stations shall be elevated above the 0.1% AEP level.
Ballybofey/ Stranorlar Trailhead	Satisfied	No loss of floodplain – Greenway constructed ‘at grade’ of flood resilient construction
Sessiagh View offline Greenway	Satisfied	Interceptor ditch required to address residual risk following adoption of measures proposed in the Ballybofey Stranorlar FRS.
St. Francis National School	Satisfied	No loss of floodplain – Greenway constructed ‘at grade’ of flood resilient construction

The sources of available flood risk information have been assessed as sufficient to assign fluvial flood zones for the entire project. A Stage 3 Flood Risk Assessment is not required for the proposed project.

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APPENDIX A

GLOSSARY OF TERMS

GLOSSARY OF TERMS

Catchment: The area that is drained by a river or artificial drainage system.

Catchment Flood Risk Assessment and Management Studies (CFRAMS): A catchment-based study involving an assessment of the risk of flooding in a catchment and the development of a strategy for managing that risk in order to reduce adverse effects on people, property and the environment. CFRAMS precede the preparation of Flood Risk Management Plans (see entry for FRMP).

Climate change: Long-term variations in global temperature and weather patterns, which occur both naturally and as a result of human activity, primarily through greenhouse gas emissions.

Core of an urban settlement: The core area of a city, town or village which acts as a centre for a broad range of employment, retail, community, residential and transport functions.

Detailed flood risk assessment: A methodology to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of flood hazard and potential risk to an existing or proposed development, of its potential impact on flood elsewhere and of the effectiveness of any proposed measures.

Estuarial (or tidal) flooding: Flooding from an estuary, where water level may be influenced by both river flows and tidal conditions, with the latter usually being dominant.

Flooding (or inundation): Flooding is the overflowing of water onto land that is normally dry. It may be caused by overtopping or breach of banks or defences, inadequate or slow drainage of rainfall, underlying groundwater levels or blocked drains and sewers. It presents a risk only when people, human assets and ecosystems are present in the areas that flood.

Flood Relief Schemes (FRS): A scheme designed to reduce the risk of flooding at a specific location.

Flood Defence: A man-made structure (e.g. embankment, bund, sluice gate, reservoir or barrier) designed to prevent flooding of areas adjacent to the defence.

Flood Risk Assessment (FRA): FRA can be undertaken at any scale from the national down to the individual site and comprises 3 stages: Flood risk identification, initial flood risk assessment and detailed flood risk assessment.

Flood Risk Identification: A desk- based study to identify whether there may be any flooding or surface water management issues related to a plan area or proposed development site that may warrant further investigation.

Flood Hazard: The features of flooding which have harmful impacts on people, property or the environment (such as the depth of water, speed of flow, rate of onset, duration, water quality, etc.).

Floodplain: A flood plain is any low-lying area of land next to a river or stream, which is susceptible to partial or complete inundation by water during a flood event.

Flood Risk: An expression of the combination of the flood probability, or likelihood and the magnitude of the potential consequences of the flood event.

Flood Storage: The temporary storage of excess run-off, or river flow in ponds, basins, reservoirs or on the flood plain.

Flood Zones: A geographic area for which the probability of flooding from rivers, estuaries or the sea is within a particular range.

Fluvial flooding: Flooding from a river or other watercourse.

Groundwater flooding: Flooding caused by groundwater escaping from the ground when the water table rises to or above ground level.

Initial flood risk assessment: A qualitative or semi-quantitative study to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information, to provide a qualitative appraisal of the risk of flooding to development, including the scope of possible mitigation measures, and the potential impact of development on flooding elsewhere, and to determine the need for further detailed assessment.

Freeboard: Factor of safety applied for water surfaces. Defines the distance between normal water level and the top of a structure, such as a dam, that impounds or restrains water.

Justification Test: An assessment of whether a development proposal within an area at risk of flooding meets specific criteria for proper planning and sustainable development and demonstrates that it will not be subject to unacceptable risk nor increase flood risk elsewhere. The justification test should be applied only where development is within flood risk areas that would be defined as inappropriate under the screening test of the sequential risk-based approach adopted by this guidance.

Likelihood (probability) of flooding: A general concept relating to the chance of an event occurring. Likelihood is generally expressed as a probability or a frequency of a flood of a given magnitude or severity occurring or being exceeded in any given year. It is based on the average frequency estimated, measured or extrapolated from records over a large number of years and is usually expressed as the chance of a particular flood level being exceeded in any one year. For example, a 1-in-100 or 1% flood is that which would, on average, be expected to occur once in 100 years, though it could happen at any time.

Ordnance Datum (or OD) Malin: is a vertical datum used by an ordnance survey as the basis for deriving altitudes on maps. A spot height may be expressed as AOD for “above ordnance datum”. Usually mean sea level (MSL) is used for the datum. In the Republic of Ireland, OD for the Ordnance Survey of Ireland is Malin Ordnance Datum: the MSL at Portmoor Pier, Malin Head, County Donegal, between 1960 and 1969. Prior to 1970, Poolbeg Ordnance Datum was used: the low water of spring tide at Poolbeg lighthouse, Dublin, on 8 April 1837. Poolbeg OD was about 2.7 metres lower than Malin OD.

Management Train/Treatment Train: the sequence of drainage components that collect, convey, store and treat runoff as it drains through the site.

Mitigation: The term is used to describe an action that helps to lessen the impacts of a process or development on the receiving environment. It is used most often in association with measures that would seek to reduce negative impacts of a process or development.

Pathways: These provide the connection between a particular source (e.g. high river or tide level) and the receptor that may be harmed (e.g. property). In flood risk management, pathways are often ‘blocked’ by barriers, such as flood defence structures, or otherwise modified to reduce the incidence of flooding.

Pluvial flooding: Usually associated with convective summer thunderstorms or high intensity rainfall cells within longer duration events, pluvial flooding is a result of rainfall-generated overland flows which arise before run-off enters any watercourse or sewer. The intensity of rainfall can be such that the run-off totally overwhelms surface water and underground drainage systems.

Regional Planning Guidelines (RPG): These provide the regional context and priorities for applying national planning strategy to each NUTS III region and encourage greater co-ordination of planning policies at the city/county level. RPGs are an important part of the flood policy hierarchy as they can assist in co-ordinating flood risk management policies at the regional level.

Resilience: Sometimes known as “wet-proofing”, resilience relates to how a building is constructed in such a way that, although flood water may enter the building, its impact is minimised, structural integrity is maintained, and repair, drying and cleaning and subsequent reoccupation are facilitated.

Receptors: Things that may be harmed by flooding (e.g. people, houses, buildings or the environment).

Residual risk: The risk which remains after all risk avoidance, substitution and mitigation measures have been implemented, on the basis that such measures can only reduce risk, not eliminate it.

Sequential Approach: The sequential approach is a risk-based method to guide development away from areas that have been identified through a flood risk assessment as being at risk from flooding. Sequential approaches are already established and working effectively in the plan-making and development management processes.

Sustainable Drainage System (SuDS): Drainage systems that are considered to be environmentally beneficial, causing minimal or no long-term detrimental impact.

Site-specific Flood Risk Assessment: An examination of the risks from all sources of flooding of the risks to and potentially arising from development on a specific site, including an examination of the effectiveness and impacts of any control or mitigation measures to be incorporated in that development.

Source: Refers to a source of hazard (e.g. the sea, heavy rainfall).

Strategic Flood Risk Assessment: The assessment of flood risk on a wide geographical area against which to assess development proposed in an area (Region, County, Town).

Vulnerability: The resilience of a particular group of people or types of property or habitats, ecosystems or species to flood risk, and their ability to respond to a hazardous condition and the damage or degree of impact they are likely to suffer in the event of a flood. For example, elderly people may be more likely to suffer injury, and be less able to evacuate, in the event of a rapid flood than younger people.

Source: The definitions above are sourced from the DoEHLG Guidelines for Planning Authorities on 'The Planning System and Flood Risk Management, 2009' and Ciria 753 "the SuDS Manual".

APPENDIX B PROPOSED DEVELOPMENT LOCATION

APPENDIX C

FLOOD RISK MAPPING ALONG THE PROPOSED DEVELOPMENT

