OPW Oifig na nOibreacha Poiblí Office of Public Works

Comhairle Contae Dhún na nGall
Donegal County Council

# Lifford Flood Relief Scheme, Co. Donegal

# Environmental Constraints Study Report

January 2021

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# 1 EXECUTIVE SUMMARY

This report sets out the key environmental issues relating to the study area for the Lifford Flood Relief Scheme which may be impacted upon by potential flood risk management measures and/ or which may impose constraints on the viability and/ or design of these measures. Information has been gathered on engineering, socio-economic, environmental, archaeological and geotechnical constraints.

Environmental constraints have been investigated under the following headings:

- Human Beings
- Ecology
- Water
- Soils & Geology
- Archaeology & Cultural Heritage
- Landscape
- Air & Climate
- Material Assets

Under each heading, the assessment methodology is first outlined, followed by a description of the defined study area or 'receiving environment'. Finally, a summary of the key constraints and implications for the proposed scheme is noted.

In addition to the assessments carried out, an opening public consultation day was held to present the Study Area to the public and invite feedback regarding the measures proposed in the North West Flood Risk Management Plan (NW FRMP) which are to be reviewed and developed through the Lifford FRS Engineering Study. Information gathered during this public consultation has been included in this report.

This report is the first stage in the environmental assessment process, which will be ongoing throughout the planning and design of the project. Information gathered or alternatives suggested arising from public consultation days, meetings with stakeholders and written representations will be considered on the grounds of engineering feasibility, environmental viability, existing constraints and economics. A summary of the key constraints identified for each of the above headings is described in the following section of this Executive Summary.

| Human Beings |
| --- |
| In designing the proposed scheme, the value (both cultural and economic) of any buildings (Residential, Retail, etc) likely to be adversely affected by the scheme should be taken into account. In addition, adverse impacts on buildings or structures of conservation interest should be minimised or avoided where possible. |
| The design of the scheme should ensure that the public amenity value of the study area is not diminished. Impacts on the public amenity areas adjacent to the rivers such as riverside walks and in particular fishing access areas should be considered and minimised or mitigated. |
| Properties and businesses currently where flood alleviation measures are to be installed will need to have access maintained/re-established during and following works. |
| The design of the scheme will need to take into consideration the proximity of proposed works to the border and the location of Lifford on main road routes for Donegal. Construction works and activities may have a negative effect on the use of Lifford as a main transit point for people and goods. Lifford being on several routes and having high traffic volumes should be taken into consideration and mitigated against. |
| Any design proposal should ensure that Lifford Bridge is maintained so that temporary disruption on local transport links and access to homes and businesses in the study area are minimised. |
| Impacts on especially sensitive receptors e.g. schools, hospitals, crèches, nursing homes should be considered in the flood risk assessment. |
| The proposed scheme should take into consideration the proposed zoning objectives set out in the County Donegal Development Plan. |
| The design of the proposed scheme should take into consideration the potential in combination effects of construction of the scheme with the proposed Riverine Project. |

| Ecology |
| --- |
| The sensitivity of the waterbodies and designated sites within the study area has no significant detail. There will most likely be effects of the function of the watercourses due to an effect on water flow. These will need to be addressed to ensure that the negative effects are minimised and mitigated. |
| The areas in and around the Deele, Finn, Foyle and Mourne waterbodies provide suitable habitats for breeding or resting locations for otter. When the details of the works option is decided upon, the areas to be affected require additional survey to determine the level of otter activity and if any breeding or resting places are present within and adjacent to the footprint of the works. Works could result in the damage or destruction of resting places and appropriate mitigation will be required to ensure no long-term adverse impacts on local otter populations. Appropriate licences may also be required from NPWS in relation to any works on or around otter breeding or resting places. |
| The Foyle catchment is important for salmonid and other fish populations. In-channel works, or permanent modification of channel banks or bed, could have an adverse impact on aquatic populations and water quality. This could arise directly through damage to in-channel habitats or indirectly through impacting upon water quality. Timing constraints will apply to any in-channel working to avoid the salmonid spawning season (usually between November and March) and the Loughs Agency must be consulted during the design stage, prior to works commencing. Appropriate measures shall also be required to prevent pollution incidents and silt mobilisation. This is particularly important for Atlantic salmon as it is a qualifying interest of the River Finn SAC and River Foyle and tributaries SAC. |
| The scheme design should take into consideration the potential impacts from loss of riparian habitat which provides food, cover and shade and helps to stabilise river banks. Significant impacts on fish populations and macroinvertebrate populations could occur due to such loss of habitat. |

| Ecology |
| --- |
| The mobilisation of high levels of silt as a result of construction within rivers can impact spawning habitats. Excessive siltation can cause eggs and fry to be smothered. Spawning salmonids and lamprey are likely to avoid traditional spawning areas due to excessive silt deposits. |
| The riparian corridor and vegetated fringe of the study area watercourses provide suitable habitat for nesting birds and also within the river walls in Lifford town that provide a number of cracks and crevices suitable for nesting birds. If possible, vegetation clearance associated with the works and any works to existing walls, should be conducted outside of the breeding bird season (March to September inclusive) to protect any nests that may be present. If this is not possible, working areas should first be searched by a suitably qualified ecologist for the presence of any nests. If found, the nests should not be disturbed until the chicks have fledged and the nest is deemed inactive. A possible ecological opportunity as part of these works will be to include nesting boxes. |
| Trees along the study area watercourses, river walls and old buildings in Lifford town and the Lifford bridge provide potential roosting opportunities for bats, with the surrounding habitat providing good foraging and commuting routes. Options that require the removal of mature trees or works to riverine built structures with the potential to support roosting bats shall be assessed for bat potential. The optimum time to carry out bat surveys is May-August inclusive. If bats are found to be present the surveys will determine the species, numbers, access points and type of roost. If a hibernation roost or maternity roost is found, they shall not be disturbed during the hibernation or maternity periods. |
| There is potential for fragmentation and degradation of existing habitats as a result of the proposed flood relief scheme infrastructure. Potential loss of habitats and connectivity between habitats may include loss or damage to hedgerows and tree lines which are important wildlife corridors for numerous species particularly bats and badger. It will be necessary to ensure that movement of species between ecological sites is not impaired by the Flood Relief Scheme. Any loss of corridors should be mitigated through the reinstatement and planting of additional corridors after construction. |
| In the design of the proposed scheme, consultation with both the Loughs Agency and NPWS will be necessary, together with an appropriate amount of survey work to establish baseline conditions in the study area watercourses. Constraints may be placed on the times of year that works in the proximity of the SAC may be carried out depending on the results of the various surveys and the requirements of the Loughs Agency and NPWS. Constraints may also be placed on the time of year/weather conditions that the surveys may be undertaken. |
| It must be ensured that there are no significant impacts on Natura 2000 sites (SAC/SPA). The River Finn SAC and River Foyle and Tributaries SAC are directly adjacent to the proposed flood relief scheme. There is potential to negatively affect the status of these designated sites. |
| Japanese knotweed, Himalayan balsam and Giant Hogweed are listed as invasive plants under the EC (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011). These regulations prohibit the introduction and dispersal of these species. Therefore, the works associated with the flood relief scheme in areas where invasive species are present must use appropriate measures to ensure their containment. Appropriate measures should be taken to ensure that the spread of these invasive species is not initiated or extended by any proposed works. An Invasive Species Management Plan will be required for the treatment of Giant Hogweed, Japanese knotweed and Himalayan balsam and other invasive species in a safe and environmentally acceptable manner. |

| Water |
| --- |
| The design of the proposed flood relief scheme should take into account the main objectives of the Water Framework Directive River Basin District Management Plan (RBDMP) by ensuring that any works proposed do not result in the deterioration of water quality and where possible contribute to the achievement of "Good" status within the study area. This represents a key constraint to the scheme development options in view of potential construction impacts to river water quality and habitats. |

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| The construction phase of the scheme has the potential to impact on the water quality of the study area watercourses through:<br>▪ Release or run-off of suspended solids from site preparation or development of construction<br>▪ Accidental release of cement or contaminated materials from the site to the study area watercourses<br>▪ Unintentional discharge of oil/diesel from the site to the study area watercourses |
| A Construction Environmental Management Plan will be required before commencement of any construction works. This should be approved in advance by the NPWS and the Loughs Agency. |
| The Flood Relief Scheme has the potential to impact on the hydrology and morphology of the study area watercourses. It is recommended that the hydrological regime of all waterbodies which might be affected by the scheme are fully considered to ensure that the WFD hydro-morphological status is not affected by the scheme. |
| The scheme should take into consideration the presence of protected water resources and water dependant terrestrial ecosystems. In particular the designation of the River Finn SAC for Salmon (QI) and as a Salmonid River in the upper reaches of the study area. The Scheme may pose a constraint to WFD targets for the Finn and Foyle catchments. |
| The hydrology of Lough Foyle should be assessed to determine any changes likely to occur such as an increase in freshwater flows to the Lough associated with the scheme. Any change in the hydrology could result in wetland habitat changes downstream in Mongalvin to Carrigans NHA, the Foyle and Faughan Estuaries SAC and Lough Foyle SPA. Conservation objectives for these designated sites include the maintenance of their wetland habitats in order to support its qualifying interests. |
| The removal and disposal of any river/estuarine sediment should follow the guidelines for handling waste under the Waste Management Acts as amended. A strict chain of custody must accompany all excavated materials taken off site for disposal. |
| The Flood Relief Scheme has the potential to impact on water quality of the study area watercourses through disturbance to a historic landfill site at Roughan resulting in accidental release of contaminants. Consideration of the historic landfill site should be considered during the selection of the FRS route. |

| **Soils and Geology** |
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| It is recommended that a preliminary geotechnical investigation be carried out once viable flood risk management measures are developed in order to identify geology and ground conditions, particularly in view of the coarse-grained alluvial clays associated with the Foyle. |
| There is potential risk of disturbance of contaminated soils associated with the historic refuse landfill during construction |
| Permanent or temporary removal of soils/excavation of bedrock may be necessary during the construction of the Flood Relief Scheme which could potentially impact bedrock and alter drainage patterns. Ground conditions within the study area will be identified through geotechnical investigation during the next stage of scheme development |
| Consideration needs to be given to the permeability of the bedrock geology within the study area while developing the design of the viable flood risk management measures. |
| There is potential risk of contamination of groundwater through spills or leaks from hazardous substances used on site during construction. Best site practice should be implemented on site and appropriate mitigation measures should be implemented where works are hydrologically connected to groundwater bodies |

| **Archaeology & Cultural Heritage** |
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| Given the provisions of the National Monuments Acts, no disturbance to, or interference with, any known archaeological sites can take place without prior Notification, assessment and consultation with the National Monuments Service of the Department of Housing, Local Government & Heritage |

| Archaeology & Cultural Heritage |
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| (DoHLGH). This should be conducted through the established consultation process via the Development Applications Unit (DAU) as part of planning. |
| Appendix F1 – E3 provides details on archaeological sites/monuments within the study area. Each site/monument is assigned a Zone of Archaeological Potential (ZAP) within which no works should be undertaken without consent of the Minister of Housing, Local Government & Heritage. These Zones are indicated in pink in the relevant figures. |
| The riverine environment of the River Finn at Lifford has high archaeological potential as attested by the discovery of several prehistoric log-boats over recent years. This area has also been a fording point on the River Finn/Foyle for millennia. |
| The site of a battle between Jacobite and Williamite forces in 1689 is recorded in the vicinity of the present-day bridge between Lifford and Strabane. There is high potential for previously unrecorded underwater and terrestrial archaeology at this location. |
| An Archaeological Impact Assessment should be carried out for the proposed scheme. This may include a programme of advance archaeological testing and/or monitoring of Site Investigations as required. |
| An Architectural Heritage Impact Assessment should be carried out for the proposed scheme. |
| All impacts on identified heritage – including areas to which local lore is connected – and their immediate environs, should be avoided where possible in the design of the proposed flood relief scheme. Where avoidance by design is not possible then archaeological investigations may be required for identified areas of archaeological potential which would be directly impacted by the proposed scheme. |
| Advance investigations should be undertaken at design stage to facilitate mitigation design and allow adequate time to evaluate and record any archaeological features or deposits that may be encountered. |
| Any ground disturbance works associated with the proposed scheme should be further assessed for archaeological potential. Appropriate mitigation should be determined during the design phase in consultation with the National Monuments Service (DoHLGH). |
| Donegal County Council Heritage and Conservation offices should be consulted at an early stage of project development. |
| The National Monument Service of the Department of Housing, Local Government & Heritage should be consulted at an early stage of the scheme development. This should include specific consultation with the Underwater Archaeology Unit (UAU) within NMS as there is high potential for encountering underwater archaeology during the project development. |

| Landscape |
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| Views from residential and commercial properties and recreational views from riverside footpaths out to the Rivers Deele, Finn, Foyle and Mourne and their river banks should be retained in areas where flood protection measures are proposed. |
| Consideration should be given to protecting and retaining the amenity areas of the study area |

| Air and Climate |
|---|
| Prior to the selection of a preferred flood relief scheme as part of the Engineering Study, it is recommended that the short-listed flood alleviation measure be assessed in relation to the impact of noise and vibration during the construction phase of the project. |
| It is recommended that mitigation measures be put in place to reduce the impacts on air quality and the noise environment during the construction phase of any proposed flood relief scheme. |
| It is recommended that the effects of vibration during the construction phase be considered in the selection process for a potential flood alleviation scheme. |

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| The scheme design should take into consideration any noise/vibration sensitive receptors such as residence, schools and retirement homes located in proximity to the flood relief scheme |
| Meteorological and climatological data should be consulted in the engineering design process. |
| The potential impacts of Climate change should be assessed with regard to the prediction of flood risk and should be taken into account in the design of a proposed flood relief scheme. |

| **Material Assets** |
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| It is recommended that the existing and proposed location of watermains and underground services in the vicinity of any proposed flood relief scheme be ascertained as part of the Engineering Study. It is recommended that Donegal County Council and other utility providers with services in the area be consulted regarding the location and priority of existing and proposed services. It is further recommended that the services be protected as part of any proposed flood relief scheme. |
| It is recommended that the Lifford Waste Water Treatment Plant is kept operational at all times, while having regard for the proposed upgrade of the plant. |
| It is recommended that Donegal County Council and the National Roads Authority and Transport Infrastructure Ireland (TII) be consulted in relation to any effects on traffic management on the existing and proposed roads infrastructure in the study area from a proposed flood relief scheme. |

# 2 INTRODUCTION

## 2.1 OVERVIEW OF SCHEME

The purpose of the Lifford Flood Relief Scheme is to alleviate the flood risk to the town of Lifford in Co. Donegal and to afford protection to the people of Lifford, their homes and properties from flooding. The aim of this project is to identify, design and submit (for planning consent) the most viable flood relief scheme that is technically, socially, environmentally and economically acceptable to alleviate flood risk in Lifford and to procure, manage and oversee the construction of that Scheme. This project follows on from the findings of the North West-Neagh Bann Catchment Flood Risk Assessment and Management (CFRAM) Study.

The purpose of this Constraints Study is to inform the feasibility study through the identification of the general baseline environmental conditions of the study area, as determined from available sources and data; and to highlight issues and important factors that may arise in relation to the planning and selection of design options for the flood relief scheme.

## 2.2 STUDY AREA

The outline scheme area for the project is the town of Lifford as identified in the CFRAM study and is referred to as the Lifford Area of Further Assessment (AFA). The scheme area is the area within which physical works are proposed to be constructed, accessed and maintained as part of any feasible scheme. This area is intended to benefit from and be protected by the scheme. The scheme area is limited to lands within the Republic of Ireland.

The study area for this Constraints Study of the proposed Flood Relief Scheme encompasses areas of additional study outside of the Lifford AFA and includes watercourses that have hydraulic influence on the area intended to benefit from and be protected by the scheme as well as areas that require environmental assessment. However, broader environmental constraints which may come to light following the engineering study, hydraulic modelling, hydrological studies and flood risk modelling, such as variances to flood risk downstream of the study area as aligned to options development, will be regarded as constraints to be highlighted as and where appropriate.

The study area covers approximately 34.3 $km^2$ encompassing the channel, flood plains and surrounding lands of three watercourses in an area known locally as 'The Three Rivers', where the River Finn meets the River Mourne to form the River Foyle, in east Donegal. The study area also includes one other watercourse, the River Deele, its flood plains and surrounding lands. The River Deele is a channel maintained under the OPW's Arterial Drainage Scheme; it has heavily modified drainage channels, embankments and flapped outfalls.

The main flood risk within the study area is due to out of bank flooding from along the left bank of the Finn and Foyle Rivers and from the right bank of the River Deele. All these watercourses are tidally influenced but fluvial flooding is the dominant mechanism of flooding within the Lifford study area. The study area is indicated below in **Figure 2.1**.

The study area is within the Foyle catchment and consists of the town of Lifford and its surrounding areas, including a large rural area to the west and Strabane town to the east. The

town of Lifford is situated in east County Donegal on the border with County Tyrone at the terminal junction of the National Primary Road N14 and the N15. Lifford town is located on the west bank of the River Foyle immediately downstream of the confluence of the River Mourne and River Finn. Lifford has an estimated population of 1,626 and a projected population of 1,706 in 2024 (County Donegal Development Plan 2018-2024).
The Rivers Finn and Foyle form part of the border with Northern Ireland in this area. As such the eastern boundary of the study area encompasses the urban area of Strabane town in Co. Tyrone and the River Mourne.

## 2.3 STAGES OF PROCESS

The Constraints Study is the first stage in the Environmental Impact Assessment of the Lifford Flood Relief Scheme and is being advanced in parallel with the Engineering Study for the Scheme. The project will be delivered in the stages outlined in **Table 2.1**.

**Table 2-1: Stages in the Planning of the Flood Relief Scheme**

| Stages | Environmental Impact Assessment | Engineering Study |
|---|---|---|
| **Stage I** | Part 1- Baseline surveys & **Constraints Study** (*this stage*)<br>Part 2- Environmental Assessment of Scheme Options & Public Consultation<br>Part 3- Screening for Appropriate Assessment and NIS (if required), Environmental Impact Assessment scoping and main report, Derogation licences, CEMP | **Identification and Development of a Preferred Scheme:**<br>Data Collection<br>Surveys<br>Hydrological Analysis<br>Hydraulic Analysis and Modelling<br>Scheme Analysis and Development<br>Public and Stakeholder Engagement<br>Set up Project Website<br>Review of CFRAM Study |
| **Stage II** | Public Exhibition and Exhibition Report | Public Exhibition/Planning Process |
| **Stage III** | AA Screening Determination, Addendums to EIAR and NIS (if required) | Detailed Construction Design, Compilation of Work Packages and the Preparation of Tenders for Contracts and of Confirmation Documents |
| **Stage IV** | | Construction Supervision and Project Management Services |
| **Stage V** | | Handover of Works |

## 2.4 SCOPE OF ASSESSMENT

Information has been gathered under the relevant headings prescribed in the Environmental Protection Agency (EPA) guidelines "*Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, 2017*".

## 2.5 CONSULTATION

Consultation has taken place with statutory and non-statutory consultees as part of the initial scoping process. Comments and information were sought from the list of consultees as detailed in **Tables 2.2 & 2.3**.

**Table 2-2: Statutory EIA Consultees**

| | STATUTORY EIA CONSULTEES |
|---|---|
| 1 | An Bord Pleanála |
| 2 | An Comhairle Ealaion (The Arts Council) |
| 3 | An Taisce - The National Trust for Ireland |
| 4 | Commission for Electricity Regulation |
| 5 | Department of Agriculture, Food and the Marine |
| 6 | Department of Culture, Heritage and the Gaeltacht |
| 7 | Department of Communications, Energy & Natural Resources |
| 8 | Department of Environment, Community and Local Government |
| 9 | Department of Justice and Equality |
| 10 | Department of the Jobs, Enterprise and Innovation |
| 11 | Department of Agriculture, Environment and Rural Affairs (Northern Ireland) |
| 12 | Environmental Protection Agency |
| 13 | Failte Ireland |
| 14 | Health and Safety Authority |
| 15 | Loughs Agency |
| 16 | Donegal County Council |
| 17 | Derry City and Strabane District Council |
| 18 | Transport Infrastructure Ireland |
| 19 | Office of Public Works |
| 20 | The Heritage Council |

**Table 2-3: Other Consultees**

| | OTHER CONSULTEES inc statutory agencies |
|---|---|
| 1 | Association of County and City Councils |
| 2 | Association of Municipal Authorities of Ireland |
| 3 | Badgerwatch |
| 4 | Bat Conservation Ireland |
| 5 | Birdwatch Ireland |
| 6 | Bord Gáis Networks |
| 7 | Bord Iascaigh Mhara (BIM) |
| 8 | Border Regional Authority |
| 9 | Bus Eireann |
| 10 | Chambers Ireland |
| 11 | Climate Action Regional Office (Atlantic Seaboard South) |
| 12 | Coarse Angling Federation of Ireland |
| 13 | Coillte |
| 14 | Commission for Energy Regulation |
| 15 | Department for Infrastructure (Northern Ireland) |
| 16 | Donegal County Development Board |
| 17 | Donegal Farm Relief Group |
| 18 | Eircom |
| 19 | Electricity Supply Board |
| 20 | Engineers Ireland |
| 21 | Environmental Pillar & Irish Environment Network |
| 22 | Federation of Irish Salmon and Sea Trout Anglers |
| 23 | Forfás |
| 24 | FWPM Project |

| OTHER CONSULTEES inc statutory agencies | |
|---|---|
| 25 | Geological Survey of Ireland |
| 26 | Health Service Executive (HSE) |
| 27 | Inland Fisheries Ireland |
| 28 | Inland Waterways Association of Ireland |
| 29 | Irish Angling Development Alliance |
| 30 | Irish Central Border Area Network |
| 31 | Irish Concrete Federation |
| 32 | Irish Countrywomen's Association |
| 33 | Irish Farmers Association |
| 34 | Irish Natural Forestry Foundation |
| 35 | Irish Peatland Conservation Council |
| 36 | Irish Small and Medium Enterprises Association (ISME) |
| 37 | Irish Water and Fish Preservation Society |
| 38 | Irish Wildlife Trust |
| 39 | Landscape Alliance Ireland |
| 40 | Met Eireann |
| 41 | Marine Institute |
| 42 | National Anglers Representative Association |
| 43 | National Organisation of Regional Game Councils |
| 44 | National Parks and Wildlife Service |
| 45 | Native Woodland Trust |
| 46 | Recreational Angling Ireland |
| 47 | Royal Society of Antiqueries of Ireland |
| 48 | Sustainable Energy Authority of Ireland |
| 49 | Sustainable Water Network (SWAN) |
| 50 | Teagasc |
| 51 | Tree Council of Ireland |
| 52 | Waterways Ireland |
| 53 | County Enterprise Board |

A copy of the letter and attachments issued to Consultees is included in Appendix A. Copies of any written correspondence received are also provided in Appendix A

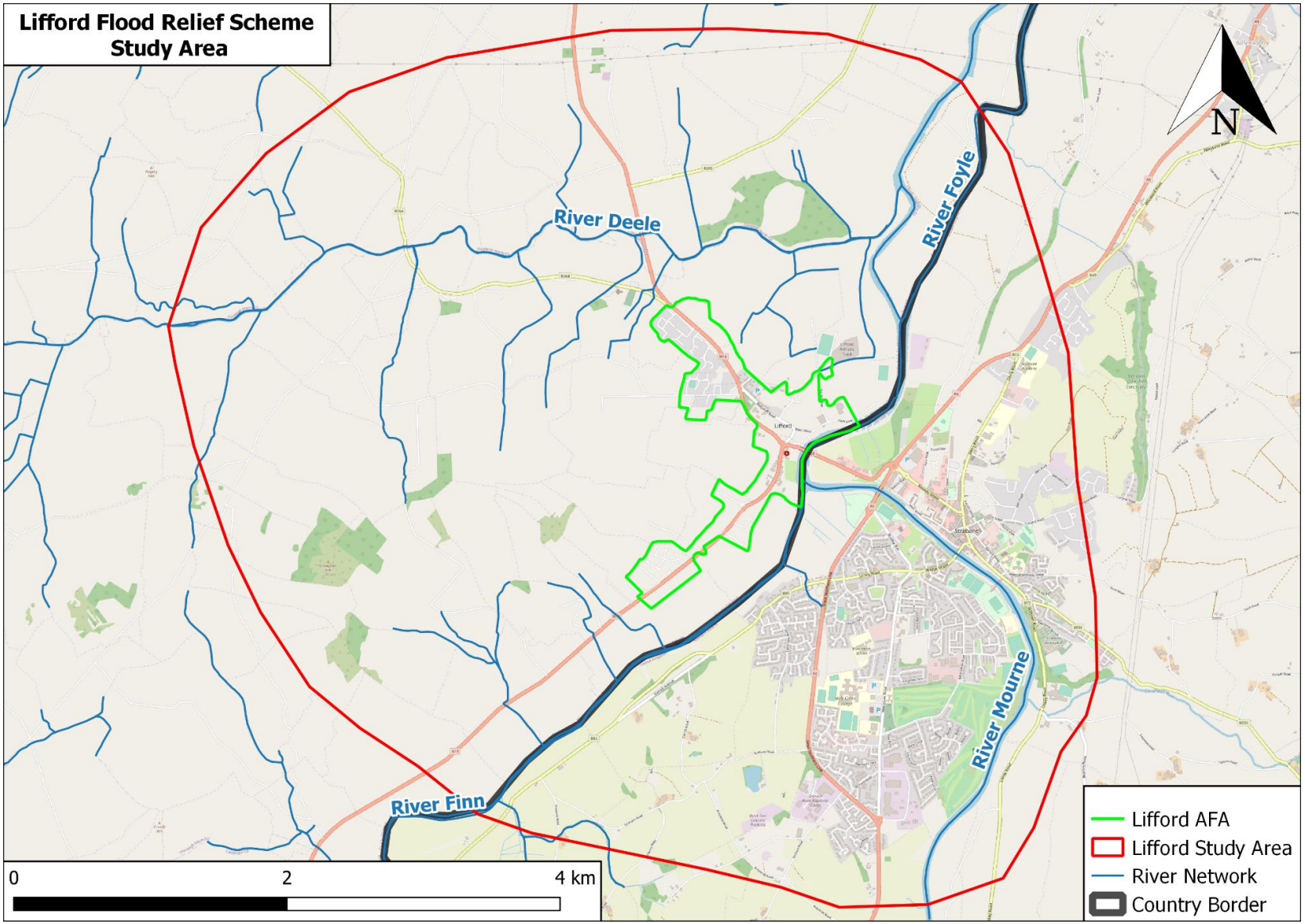


**Figure 2-1: Map of the Lifford FRS Constraints Study Area**

# 3 SCHEME CONTEXT AND BACKGROUND

## 3.1 HISTORY OF FLOODING

Lifford has had a history of serious flood events with the most recent significant floods occurring in November and December 2015 (Storm Desmond) and in August 2017. The source of these flood events is due to the confluence of the Rivers Finn, Mourne, Foyle and Deele which are also subject to tidal influences of Lough Foyle and convective rainfall in the surrounding area contributing to high river levels and ineffective drainage schemes. The OPW's flooding website (http://www.floodmaps.ie/) was examined and highlighted areas affected by flooding and types of flooding that have occurred in Lifford. A summary of the flood history affecting Lifford is presented in **Table 3.1** below. The need for such a scheme was brought into focus by the effects of the flood events summarised below and particularly Storm Desmond.

**Table 3-1:Summary of past flood events in Lifford**

| Event Date | Source | Summary of Reports |
|---|---|---|
| 23rd Aug 2017 | Fluvial | Report of flooding from DCC to the courthouse at Lifford. Extensive flooding was widely reported across the north west (Counties Donegal, Tyrone and Derry) following a high intensity rainfall event. |
| 5th Dec 2015 | Fluvial | Extensive flooding to Lifford following Storm Desmond. A number of residential and commercial properties were flooded in the Roughan area, Main Street as well as DCC offices. A number of commercial properties were also flooded along the Lifford Road area (Strabane). |
| 14th Dec 2011 | Fluvial/ Pluvial | Reports of road flooding on N14 (to Letterkenny) and N15 (to Ballybofey / Stranorlar) on website Donegal Daily |
| 25th Oct 2011 | Fluvial/ Pluvial | Flooding at Ballindrait and to the rear of McCauley's café in Lifford reported on website Donegal Daily. |
| 1st Nov 2009 | Fluvial/ Pluvial | Report of flooding in Lifford where fire brigade units were called out to assist in Lifford and Castlefinn (www.independent.ie). |
| 28th Oct 2000 | Fluvial | OPW memo reports that garden of a house in Rossgier was flooded from the River Deele. |
| 22nd Dec 1999 | Pluvial | A report in the Irish Times stated that a number of houses on the Coneyburrow Road were flooded by overflowing drains. Firemen used pumps to clear the flooding in the ground floor of the houses. |
| 28th/29th Oct 1989 | Fluvial | A report in the Donegal Democrat states that McCauleys café and its basement in Lifford were flooded when the river burst its banks - the fire brigade was in attendance for over 12 hours. There were also reports of road flooding at Cloughfin close to the River Deele. |
| 22nd Oct 1987 | Fluvial | No specific reports of flooding to Lifford however the town of Strabane was badly flooded as a flood wall in Strabane failed leading to extensive flooding of the town centre from the River Mourne. Aerial photographs of the flooding are available from Infrastructure NI that indicate flooding to Lifford particularly in the Roughan area to the north of the town centre. |
| 20th/21st Sep 1985 | Fluvial/ Tidal | Reports of the Finn and Foyle overtopping their banks at high tide in many locations. |

## 3.2 FUTURE CHANGES

The risk of flooding may increase with time. Future changes, which have the potential to affect the risk of flooding include:

- Climate Change potentially resulting in increases in sea level, storm event magnitude and frequency, and rainfall depths, intensities and patterns.
- Development within the catchment along any of the four rivers or Lough Foyle, which depending on the type of development may have the potential to increase flooding and water drainage.
- Changes in land use, including afforestation and land drainage.
- The proposed cross border Riverine Park project between the towns of Lifford and Strabane which is located immediately downstream of the urban extent of Lifford.
- The proposed T-TEN road development which includes a new bridge crossing of the River Finn upstream of Lifford.
- The Shared Water Enhancement & Loughs Legacy (SWELL) project which aims to improve the water quality of Lough Foyle through better management of wastewater discharges.
- The OPW Arterial Drainage Scheme five-year maintenance cycle involves both channel and embankment maintenance on the Rivers Deele and embankment maintenance on the River Foyle (left bank) located immediately downstream of the urban extent of Lifford and includes activities such as silt and vegetation management, mowing and structure maintenance to retain scheme integrity and operational design capacity. Tributaries of the River Deele which are drainage channels in the Roughan area within the Study Area are included in the Arterial Drainage Scheme and occur within the floodplain.
- The North West Greenway project includes the Strabane-Lifford greenway which proposes a 3.5km shared pedestrian/cycle paths through the upgrading of existing roads, pathways and transit routes within Strabane and Lifford.

## 3.3 POTENTIAL FLOOD RISK MANAGEMENT MEASURES

The OPW's North Western-Neagh Bann CFRAM study identified Lifford as an Area for Further Assessment (AFA) and concluded that Lifford would benefit from a flood relief scheme. Potentially viable flood relief works for Lifford AFA identified in the CFRAM study consist of a series of flood embankments and walls beside the River Finn/Foyle. The proposed measures would also require raising two local roads in the northern part of the AFA known as the Roughan.

The proposed measures rely on flood protection being provided by some existing embankments that were constructed to provide protection to agricultural land, and that were not constructed to the modern engineering standards that would be applied now when providing urban flood protection.

The viable scheme option for Lifford identified at CFRAM level is summarised as follows and **Figure 3.1** below:

'*Hard defences with a standard level of protection to the 1% AEP fluvial event with an average height of 2.1m and a total length of 2.6km. As a general rule hard defences are kept as far back from the river channel or coastline as possible allowing the floodplain function to remain active. Where this is not possible, due to flood risk receptors being located within the floodplain, hard*

*defenced are placed around the property boundary to afford it protection. Where space allows, flood embankments are used but where space is restricted flood walls are utilised.'*

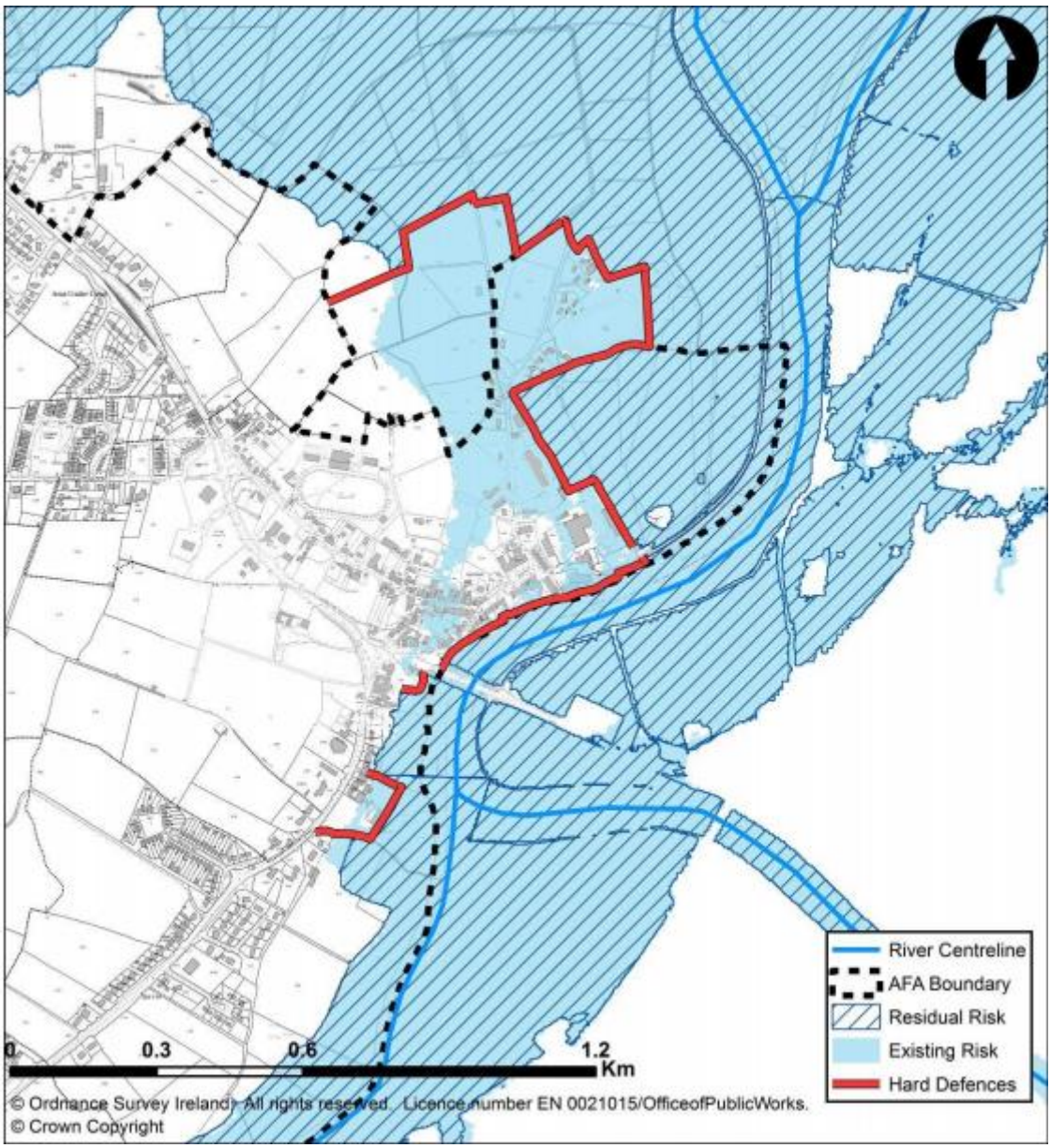


**Figure 3-1 The viable scheme option identified in the North Western Flood Risk Management Plan**

An Engineering Study is being advanced in parallel with the Environmental Assessment of the proposed flood relief scheme. The constraints identified in this report will inform the selection of flood risk management measures as part of the Engineering Study.
The range of engineering measures typically considered for flood relief schemes include, but are not limited to the following:

a) Do Nothing (i.e., implement no new flood alleviation measures);

b) Non-Structural Measures (e.g. flood warning system or individual property protection);

c) Relocation of properties and/or infrastructure;

d) Reconstruction of Properties and/or infrastructure to a higher level;

e) Flow Diversion (e.g. stream diversion or flood flow bypass channel);

f) Flow Reduction (e.g. upstream catchment management or flood storage);

g) Flood Containment through Construction of Flood Defences;

h) Increase Conveyance of Channel (upstream and/or through and/or downstream of the town);

i) Sediment Deposition and Possible Sediment Traps;

j) Pump storm waters from behind flood defences;

k) Measure Specific to the Study Location.

It is not possible, at this stage, to define the number of scheme options that will require environmental assessment, although a typical Engineering Study of this nature will identify between three and five viable options including the do nothing and do minimum scenarios.

## 3.4 TOPOGRAPHY AND MAPPING

Lifford on the west bank, and Strabane on the east bank of the River Foyle, are located on low lying, flat terrain just above river level. The topographic character of the study area is such that all three rivers occupy low lying elevations with associated flood plains.

The topography of Lifford town itself is relatively flat and level. To the west of the town the topography rises steadily to Croaghan Hill reaching a peak elevation of 217m. Across the River Finn the topography of Strabane within the study area boundary is also relatively flat with no significant hills or mountains. The town is situated on the River Mourne near its confluence with the Finn and Knockavoe Hill marks the beginning of the Sperrin Mountains to the east of the study area (**Figure 3.2**). The following mapping was used in order to prepare this Constraints Study:

- Ordnance Survey Discovery Series Mapping at 1:50,000 scale
- Old Raster 6" Mapping
- Old Raster 25" Mapping

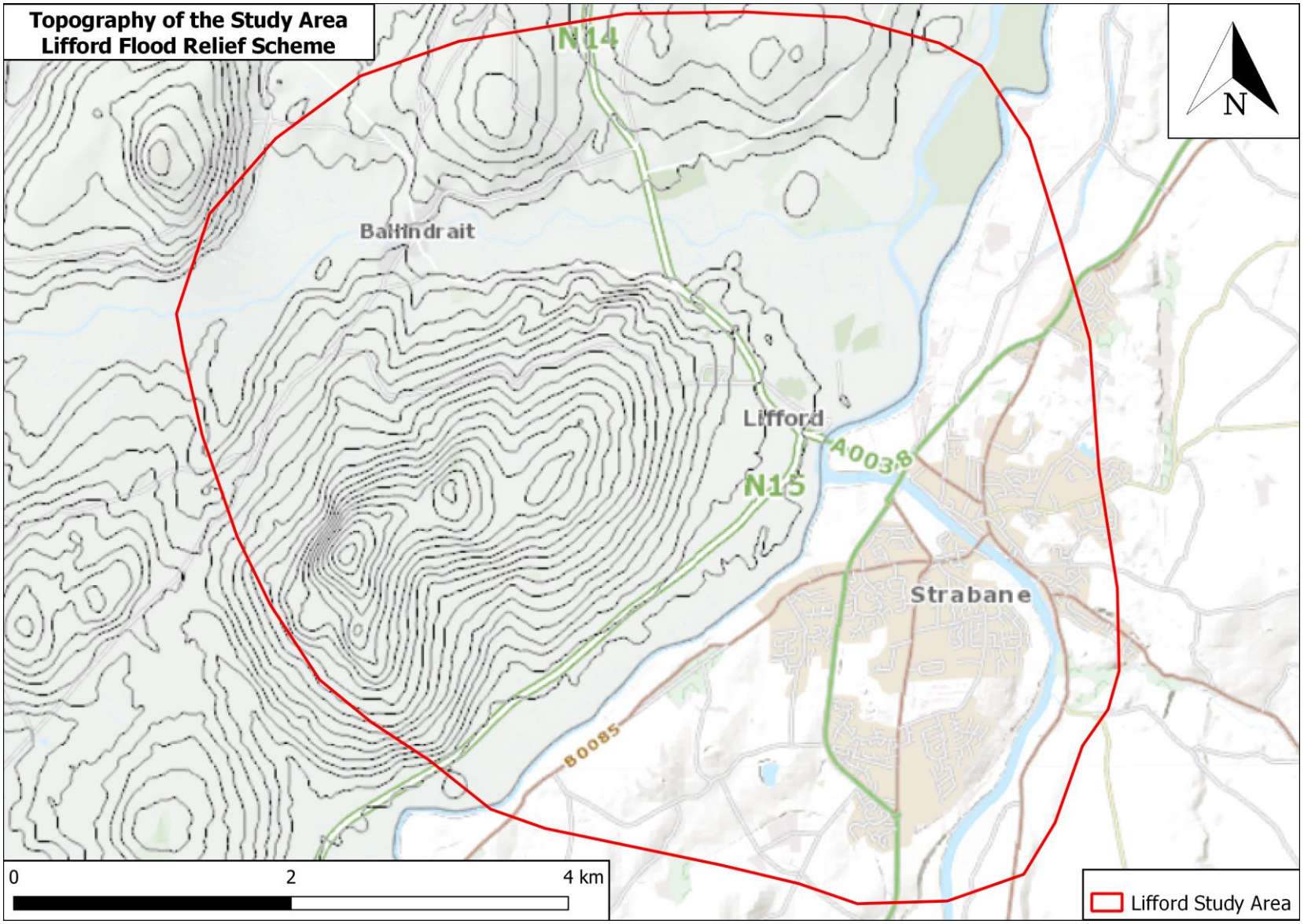


**Figure 3-2 Topography of the Lifford Flood Relief Scheme Study Area**

# 4 ENVIRONMENTAL CONSTRAINTS

## 4.1 INTRODUCTION

The purpose of this section of the report is to describe the key environmental issues relating to the Lifford Flood Relief Scheme which may be impacted upon by potentially viable flood risk management measures and/or which may impose constraints on the viability and/or design of these measures.

## 4.2 METHODOLOGY AND GUIDELINES

This constraints study is the initial stage in the Environmental Impact Assessment for the Lifford Flood Relief Scheme and is being carried out in accordance with the Environmental Protection Agency (EPA) '*Draft Guidelines on the information to be contained in the Environmental Impact Assessment Report (EIAR)*' 2017. Information has been gathered under relevant headings prescribed in the EPA Guidelines.

The following sections outline the findings of the Constraints Study and identify any potential environmental constraints associated with the scheme.

## 4.3 POPULATION AND HUMAN HEALTH

This section outlines the socio-economic features of the study area that may impact on the selection of flood alleviation measures for the proposed scheme.

### 4.3.1 Settlements and Planning Policy

The following sources of information were utilised in the preparation of this section:

- County Donegal Development Plan 2018-2024
- Census of Ireland 2016 (www.cso.ie)
- Donegal County Council Website
- North Western River Basin Management Plan 2009-2015
- Strabane Area Plan 1986-2001
- Draft Derry City and Strabane District Local Development Plan (2032)

The major settlements within the study area are Lifford town and Strabane town. Lifford is the county town of County Donegal. It is the administrative capital of the county and the seat of Donegal County Council. Lifford has been identified as a '*Strategic Town due to its Special Economic Function*' in the County Donegal Development Plan (2018-2024). As a strategic town it is considered to play a critical role in driving growth and development in the County. Lifford has also been identified by the Department of Housing, Local Government and Heritage as a historic town of general protection. As a border town it is an ideal location for goods distribution and cross border trade. The border between the Republic of Ireland and Northern Ireland is only a short drive away to the east.

### 4.3.2 Population and Housing

In the period 2011-2016 the population of the Lifford Electoral Area decreased from 1,658 to 1,626, a decrease of 1.5% and has remained static within the period from 1996 to 2016, with a projected population in 2024 of 1,706.

The County Donegal Development Plan (2018-2024) identified Lifford as one of 15 strategic towns in the county as it performs a special economic function (Layer 2B Town). The strategic towns are a priority for regeneration, renewal and development and will contribute to realising the population ambition for the County.

Lifford provides for a range of services, facilities, functions that can be directed towards its location and vicinity to the border and road connections to the rest of the county. While Lifford town is an urban area beyond this, and within the remainder of the study area, areas are open countryside and these have been designated as being either 'Under Strong Urban Influence', particularly to the north and immediate west, or as a 'Stronger Rural Area' particularly to the south west. The objectives and policies of the County Donegal Development Plan recognises the role of rural housing and aim to cater for the level of demand that is anticipated and where there is clear evidence to demonstrate a genuine need to live in a rural area.

Donegal County Council has proposed a Social Housing Development at Gallow Lane in Lifford to construct 29 no. high quality, energy efficient houses that will help address the existing social housing need in the Lifford area and the plan is at Public Consultation stage.

The zoning map of Lifford from the County Donegal Development Plan 2018-2024 and the zoning map for Strabane from the Strabane Area Plan 1986-2001 are provided in Appendix B of this Constraints Study.

### 4.3.3 Industry and Business

Lifford is a Tier 3 settlement and serves as an important service centre for the wider rural area offering a wide range of services and functions. It is on the vital road network between the County, the rest of Ireland and Northern Ireland. There are a number of significant employers within the town including local retailers/restaurants and the principal offices of Donegal County Council, making it the administrative hub of the county. Lifford is located within 25 kilometres of the much larger urban centres of Letterkenny and Derry, a linked Gateway in the National Spatial Strategy and the Regional Planning Guidelines and shares a border with Strabane along the River Foyle. Many employees in the town commute from a broad hinterland including Northern Ireland.

### 4.3.4 IPPC Licenced Facilities

The EPA licenses large-scale industrial and agricultural activities under the Integrated Pollution Prevention Control Directive (IPPC licences). Facilities downstream of the study area were also considered and the following facilities within the study area are listed on the EPA website as licensed:

**Table 4-1: IPPC Licensed Facilities in the vicinity of the Study Area**

| Facility | Address | Activity Category |
|---|---|---|
| Aurivo Consumer Foods Limited P1035-01 | Crossroads, Killygordon, Lifford, Donegal | Treatment and processing of milk only, the quantity of milk received being greater than 200 tonnes per day and Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC concerning urban waste-water treatment (i) biological treatment (ii) physico-chemical treatment |
| Robert Smyth and Sons (Strabane and Donegal) Ltd P1040-01 | Robert Smyth and Sons (Strabane and Donegal) Ltd t/a Smyths Daleside Feeds, Ballindrait, Lifford, Donegal | The treatment and processing, other than exclusively packaging, of the following raw materials, whether previously processed or unprocessed, intended for the production of food or feed from: (i) Only vegetable raw materials with a finished product production capacity greater than 300 tonnes per day; |

### 4.3.5 Tourism

Tourism is one of the major contributors to the national economy and is a significant source of full time and seasonal employment. Expenditure by tourists visiting Ireland (excluding receipts paid to Irish carriers by foreign visitors) was estimated to be worth €5.6 billion in 2018 (latest available figures), this represents growth of 6% on 2017. Combining spending by international tourists with the money spent by Irish residents taking trips here and receipts paid to Irish carriers by foreign visitors, total tourism expenditure in 2018 was estimated to be €9.4 billion.

Ireland is divided into eight tourism regions. The Border Region, in which the study area is located, comprises Counties Cavan, Donegal, Leitrim, Monaghan, Sligo and Louth. The Border Region benefited from 16% of the total number of tourists to the country and 6.2% of the total tourism income generated in Ireland for that year.

**Table 4-2** provides Fáilte Ireland figures showing the type of activities that overseas tourists engaged in and a breakdown of the number of participants that undertook each activity. From these figures, it can be seen that Hiking/cross country walking visits form the majority of all activities enjoyed in Ireland.

**Table 4-2: Activities undertaken by overseas visitors whilst visiting Ireland**

| Holiday Activities of Overseas Participants (000s) | 2018 | 2016 | 2015 | 2014 | 2013 | 2012 |
|---|---|---|---|---|---|---|
| Hiking/cross country walking | 2,679 | 2,077 | 1,674 | 1,193 | 742 | 578 |
| Cycling | 504 | 399 | 355 | 286 | 241 | 171 |
| Golf | 221 | 193 | 198 | 172 | 204 | 118 |
| Angling | 146 | 131 | 163 | 157 | 127 | 149 |
| Equestrian | 126 | 98 | 75 | 79 | 99 | 66 |

None of Irelands most popular free or paid sites are located in the Lifford catchment. The Donegal County Development Plan (2018-2024) acknowledges immense potential of Donegal's old railway lines and other linkages to act as Greenways for walking and cycling tourism. The council aims to work with key stakeholders to facilitate the development of Greenways, walking and cycling routes; and have identified potential greenway developments including Carrigans

to Lifford, Lifford to Letterkenny and Lifford to Ballybofey, which accord with the objectives in the Tourism chapter of the Development Plan.

A plan is currently under way to develop the Strabane to Lifford section of the North West Greenway Network.

#### 4.3.5.1 Local Amenities and Attractions

Lifford has several amenities and tourist attractions including the Three Coins Sculpture, Lifford Old Courthouse (museum, library and restaurant), Lifford Community Centre and the Eclipse cinema.

### 4.3.6 Community Facilities

#### 4.3.6.1 Education

There are four primary schools in Lifford, St Patrick's National School (mixed), Scoil Mhuire gan Smal National School (mixed), Scoil Cholmcille Naofa National School (mixed) and Cloughfin National School (mixed) catering for a combined student population of 357 pupils.

There are no secondary schools in Lifford. For second level education, students travel to Raphoe, Ballybofey / Stranorlar, or Letterkenny in the Republic of Ireland; or to secondary schools in Strabane, Northern Ireland.

#### 4.3.6.2 Sports and Recreation

Lifford is home to several sporting clubs and voluntary organisations. These include GAA, rowing and athletics clubs. Lifford also has several voluntary programmes and is in close vicinity to other areas with more activities.

There are a number of public spaces available in Lifford including the parkland garden facing the river at Lifford Community Hospital. The minor road around the Roughan area is a popular walking route, used by local people. An estimated 10 to 20 people per hour (morning) use the circuit route singly or in small groups (e.g., families). There is open access along the River Foyle via Greenbrae and this rough walking is occasioned by small numbers, including along the existing embankment. There is an equivalent river side path used by local people on the Strabane (east) side of the Foyle.

Croaghan Gun Club and Lifford Gun Club have signage around the countryside of Lifford, such as the Roughan. It has been observed locally that gamebirds or rough shooting is less active than it has been historically and this may be a response to the rising popularity of recreational walking.

The Strabane Lifford Angling Association along with several angling clubs are located within the study area. Salmon and trout fishing continues on the Foyle, Mourne and Finn despite the decline in Salmon numbers. The Strabane and Lifford Anglers Association is very active in the area along with several angling clubs and connectivity to the river would be a key concern to them and other anglers visiting the area.

#### 4.3.6.3 Riverine Park Proposal

This proposed cross-border (INTERREG) project will involve a new pedestrian bridge across the River Foyle just downstream of Lifford creating thirty acres of new cross-border community park space and infrastructure. The project is scheduled to commence in March 2022 but is subject to planning permission and environmental assessment. The project planners intend to develop flood defences along the existing embankment infrastructure. This does not conform to the existing potential route/alignment of the Lifford FRS options under consideration and gives rise to options to be examined as alternatives going forward. In so far as there is an optimal approach to be determined that should encompass future as well as current development, the interaction of the Riverine Park proposal and the FRS represents both a constraint and an opportunity that adds complexity to the development of the scheme options. Furthermore, given the ambition of the Riverine Park planners to commence construction before the Lifford FRS, there are potential interactions between construction procedures of both projects that may give rise to constraints, such as delay to the later project. Environmental considerations may also give rise to constraints due to in combination impacts that will require mitigation potentially affecting the timing of certain processes.

### 4.3.7 Key Constraints

- In designing the proposed scheme, the value (both cultural and economic) of any buildings (Residential, Retail, etc) likely to be adversely affected by the scheme should be taken into account. In addition, adverse impacts on buildings or structures of conservation interest should be minimised or avoided where possible.
- The design of the scheme should ensure that the public amenity value of the study area is not diminished. Impacts on the public amenity areas adjacent to the rivers such as riverside walks and in particular fishing access areas should be considered and minimised or mitigated.
- If proposed flood alleviation measures are implemented access to adjacent properties and businesses will need to be maintained/re-established during and following works.
- The design of the scheme will need to take into consideration the proximity of proposed works to the border and the location of Lifford on gateway roads for Donegal. Construction works and activities may have negative effects on the functionality of Lifford as a main transit point for people and goods, being located on a national primary route, other routes and having high traffic volumes.
- Design options should consider that Lifford Bridge can be maintained in use without disruption to transport links or access to homes and businesses in the study area.
- Impacts on sensitive receptors including schools, hospitals, crèches, nursing homes should be considered with a view to minimising adverse effects or disruption.
- The proposed scheme should take into consideration the proposed zoning objectives set out in the County Donegal Development Plan.
- There could be both positive and negative constraints arising from the planning and potential construction interactions of the Lifford FRS and the proposed Riverine Project.

## 4.4 ECOLOGY

This constraints study has been carried out to provide decision makers with clear and concise information on the international, national, regional and local issues that must be considered when planning and designing the Lifford Flood Relief Scheme.

This section identifies ecological receptors that are potentially sensitive to flood risk management measures and could be susceptible to impacts of some scheme options and designs under consideration. The findings of this section will inform subsequent stages of the environmental assessments.

### 4.4.1 Methodology

The methodology followed in completing this section of the report consisted of desktop research and consultation with a number of governmental and non-governmental bodies. In addition, walkover surveys were undertaken in early 2020 to record and assess baseline ecology conditions and are also used to inform this constraints evaluation.

The following documentary resources were used in the compilation of this section of the constraints report:

- 1:50,000 scale OS Discovery maps series;
- 1:10,560 OS Maps of the Study Area
- Aerial ortho-photography of the Study Area
- NPWS site synopses, information and data on designated sites and protected species.
- New Atlas of the British & Irish Flora (Preston et al., 2002)
- The Atlas of Breeding Birds in Britain and Ireland' (Sharrock, 1976), 'The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991' (Gibbons et al., 1993) and 'The Atlas of Wintering Birds in Britain and Ireland' (Lack, 1986)
- Biodiversity Ireland Database https://maps.biodiversityireland.ie/
- The EPA website https://gis.epa.ie/EPAMaps/Water
- The Water Framework Directive website http://www.wfdireland.ie/
- The EPA website https://www.catchments.ie/
- The BOCCI red data list (Colhoun and Cummins, 2013)

### 4.4.2 Desk Top Study

#### 4.4.2.1 Designated Areas

With the introduction of the EU Habitats Directive (92/43/EEC) which was transposed into Irish law as the Natural Habitats Regulations, 1997, the European Union formally recognised the significance of protecting rare and endangered species of flora and fauna, and also, more importantly, their habitats. Member states were directed to provide lists of sites for designation.

Natural Heritage Areas (NHA)

NHAs are heritage sites designated under the Wildlife (Amendment) Act 2000 for the conservation of flora, fauna, habitats and geological features of national importance. Management of NHAs is guided by planning policy. It was from these NHAs that the most important sites were selected for international designation as SACs and SPAs.

Areas of Special Scientific Interest

Areas of Special Scientific Interest (ASSIs) are designated under the Environment (Northern Ireland) Order 2002. The Oder makes it an offence for anyone to intentionally or recklessly damage any natural feature of an ASSI. ASSIs are designated based on their scientific interest relating to the flora or fauna that is found in the area, or because of geological features.

European Sites: Special Areas of Conservation (SAC) and Special Protection Areas (SPA)

SACs are designated for the conservation of flora, fauna and habitats of European importance, and SPAs for conservation of birds and their habitats of European importance. They form part of the "Natura 2000" network of protected areas throughout the EU.

Annex I of the Habitats Directive lists habitats of importance across the EU biogeographical area to be protected. 'Priority' habitats by virtue of limited range and poor conservation status are subject to more rigorous protection measures and in Ireland, include raised bogs, active blanket bogs, and turloughs. Annex II of the Directive lists species whose habitats must be protected and includes Otter and Atlantic Salmon, which occur throughout the study area.

#### 4.4.2.2 Designated Sites in the Vicinity of the Study Area

The National Parks and Wildlife Service (NPWS) publish synopses of the information regarding designated areas in the Republic of Ireland. The Northern Ireland Environment Agency (NIEA) publish synopses of designated areas information in Northern Ireland. Best practice guidance (DoE, 2009) is that all designated sites within 15km of a project be initially screened for impacts.

European (Natura 2000) sites

The nearest European sites (**Table 4.3**) are:

- River Finn SAC (Site Code:002301)
- River Foyle and Tributaries SAC (Site Code: UK0030320)
- Moneygal Bog SAC (Site Code: UK0030211)
- Lough Foyle SPA (Site Codes: 004087/ UK9020031)

The proposed flood relief scheme is directly adjacent to the River Finn SAC, and the River Foyle and Tributaries SAC. Due to the proximity of these sites to the proposed flood defences it is considered that they will be directly affected by the proposed scheme should be considered as a constraint of this project, as further elucidated below.

Moneygal Bog SAC is located approximately 9.5 km upstream of the study area and is located within Northern Ireland near the border of the Republic. The Egglybane Stream rises in this designated site and flows into the Finn River catchment within which the works are proposed. However, it is considered unlikely that this site would be impacted by the proposed flood relief scheme given that it is a significant distance upstream of the proposed works area and the site itself is located within a different river catchment.

The Lough Foyle SPAs are two sites designated in both the Republic of Ireland and in Northern Ireland in respect of bird populations and habitats and covers both west of and the east sides of Lough Foyle, respectively. The sites are located approximately 29.6 km downstream of the

proposed flood relief schemes. These sites are unlikely to be directly affected by the proposed works by virtue of their distance from them, but form part of the contiguous water body and, as such, it is conceivable that hydrological works upstream could possibly affect tidal dynamics downstream, and of the waterbody overall; and may therefore be considered as a constraint to this project.

The below European sites are within 15km of the study area but are not directly hydrologically connected to the study area and are unlikely to be affected by works (**Figure 4.1**).

- Lough Swilly SAC (Site Code:002287)
- Lough Swilly SPA (Site Code:004075)
- Ballyarr Wood SAC (Site Code: 000116)
- Leannan River SAC (Site Code: 002176)
- River Faughan and Tributaries SAC (Site Code: UK0030361)
- Owenkillew River SAC (Site Code: UK0030233)

**Table 4-3: European Sites identified as constraints to the Lifford FRS**

| Site Name | Qualifying Interests |
|---|---|
| River Finn SAC (Site Code:002301) | ▪ Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)<br>▪ Northern Atlantic wet heaths with *Erica tetralix*<br>▪ Blanket bogs (*if active bog)<br>▪ Transition mires and quaking bogs<br>▪ *Salmo salar* (Salmon)<br>▪ *Lutra lutra* (Otter) |
| River Foyle and Tributaries SAC (Site Code: UK0030320) | ▪ Water courses of plain to montane levels with Ranunculion fluitantis and Callitricho-Batrachion vegetation<br>▪ *Salmo salar* (Salmon)<br>▪ *Lutra lutra* (Otter) |
| Lough Foyle SPA (Site Code: 004087) | ▪ Red-throated Diver (*Gavia stellata*)<br>▪ Great Crested Grebe (*Podiceps cristatus*)<br>▪ Bewick's Swan (*Cygnus columbianus bewickii*)<br>▪ Whooper Swan (*Cygnus cygnus*)<br>▪ Greylag Goose (*Anser anser*)<br>▪ Light-bellied Brent Goose (*Branta bernicla hrota*)<br>▪ Shelduck (*Tadorna tadorna*)<br>▪ Wigeon (*Anas penelope*)<br>▪ Teal (*Anas crecca*)<br>▪ Mallard (*Anas platyrhynchos*)<br>▪ Eider (*Somateria mollissima*)<br>▪ Red-breasted Merganser (*Mergus serrator*)<br>▪ Oystercatcher (*Haematopus ostralegus*)<br>▪ Golden Plover (*Pluvialis apricaria*)<br>▪ Lapwing (*Vanellus vanellus*)<br>▪ Knot (*Calidris canutus*)<br>▪ Dunlin (*Calidris alpina*)<br>▪ Bar-tailed Godwit (*Limosa lapponica*)<br>▪ Curlew (*Numenius arquata*)<br>▪ Redshank (*Tringa totanus*)<br>▪ Black-headed Gull (*Chroicocephalus ridibundus*)<br>▪ Common Gull (*Larus canus*)<br>▪ Herring Gull (*Larus argentatus*)<br>▪ Wetland and Waterbirds |
| Lough Foyle SPA (Site Code: UK9020031) | ▪ Light-bellied Brent Goose (*Branta bernicla hrota*)<br>▪ Whooper Swan (*Cygnus cygnus*)<br>▪ Bar-tailed Godwit (*Limosa lapponica*) |

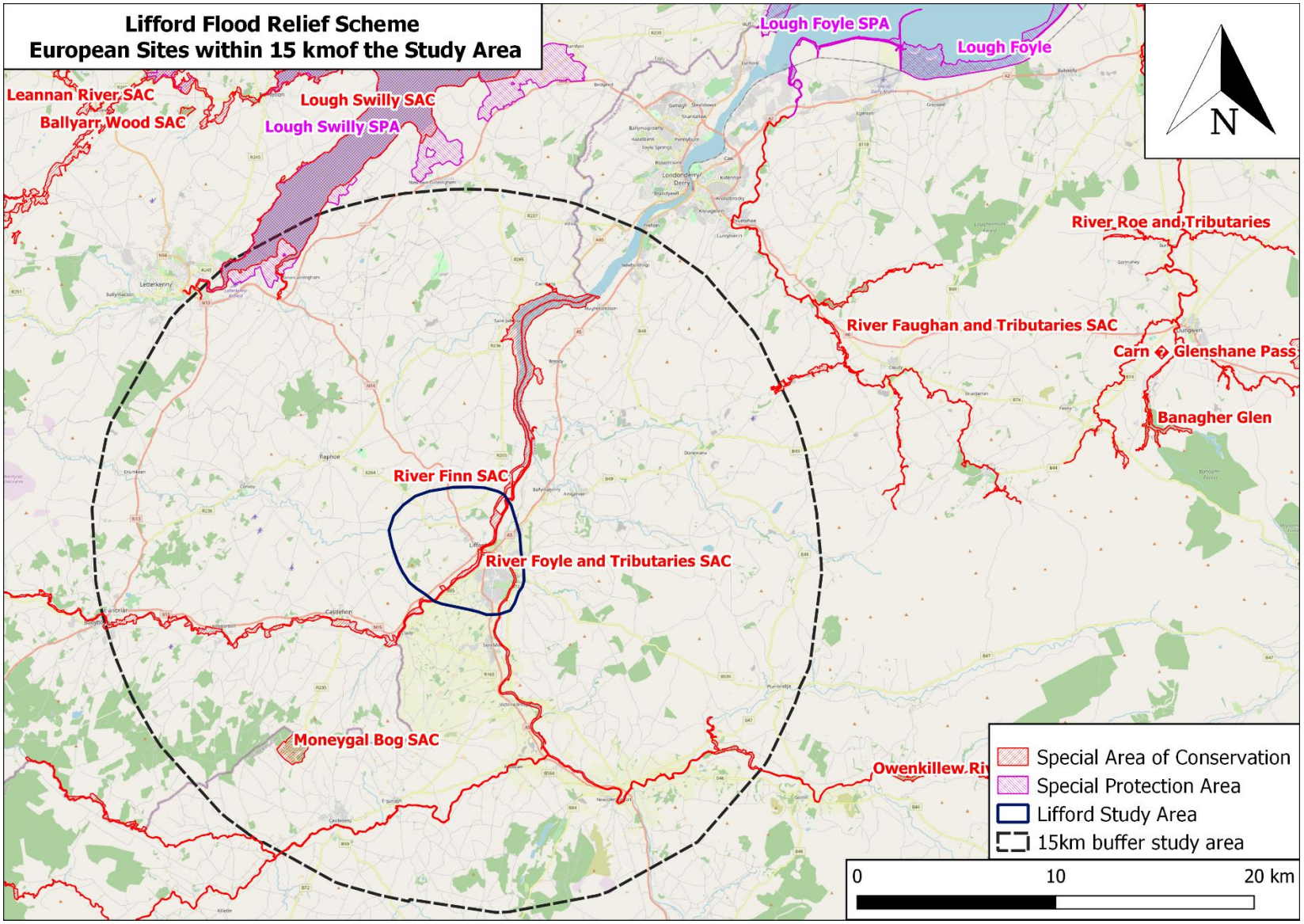


**Figure 4-1: European Sites within 15km of the Study Area**

Other Designated Sites

Where a nationally designated site (NHAs/ASSIs) overlaps with the boundary of a European designated site the potential for impacts are considered under the European designation.

There are no Natural Heritage Areas (NHAs) located within the study area. There are four proposed NHAs located within 15 km of the proposed flood relief scheme.

- River Foyle, Mongavlin To Carrigans pNHA (Site Code 002067)
- Feedyglass Woods pNHA (Site Code 001129)
- Lough Swilly Including Big Isle, Blanket Nook & Inch Lake NHA (Site Code 00166)- Considered as SAC
- Port Lough pNHA (Site Code 000180)

Lough Swilly Including Big Isle, Blanket Nook & Inch Lake pNHA and Port Lough pNHA are within 15km of the study area but are not directly hydrologically connected to the study area and are unlikely to be affected by works.

Feddyglass Woods pNHA is located approximately 4.6 km North of the proposed flood defences and is located on the Swilly (Burn).

River Foyle, Monhavlin To Carrigans pNHA is located approximately 8.2 km downstream of the proposed flood defences along the shores of Lough Foyle.

There is one Area of Special Scientific Interest (ASSI) located within the study area, the River Foyle and Tributaries ASSI. This site is also designated an SAC, as listed above. There are thirteen ASSIs located within 15 km of the proposed flood relief scheme (**Figure 4.2**).

- Butterlope Glen ASSI (Site Code: ASSI325)
- Baronscourt ASSI (Site Code: ASSI349)
- Lisnaragh ASSI (Site Code: ASSI288)
- Aghabrack ASSI (Site Code: ASSI304)
- Grange Wood ASSI (Site Code: ASSI196)
- Owenkillew and Glenelly Woods ASSI (Site Code: ASSI062)
- Monegal Bog ASSI (Site Code: ASSI005)- Considered as SAC
- Silverbrook Woods ASSI (Site Code: ASSI195)
- Strabane Glen ASSI (Site Code: ASSI058)
- Corbylin Wood ASSI (Site Code: ASSI197)
- McKean's Moss ASSI (Site Code: ASSI128)
- Owenkillew River ASSI (Site Code: ASSI213)- Considered as SAC
- River Foyle and Tributaries ASSI (Site Code: ASSI229)- Considered as SAC

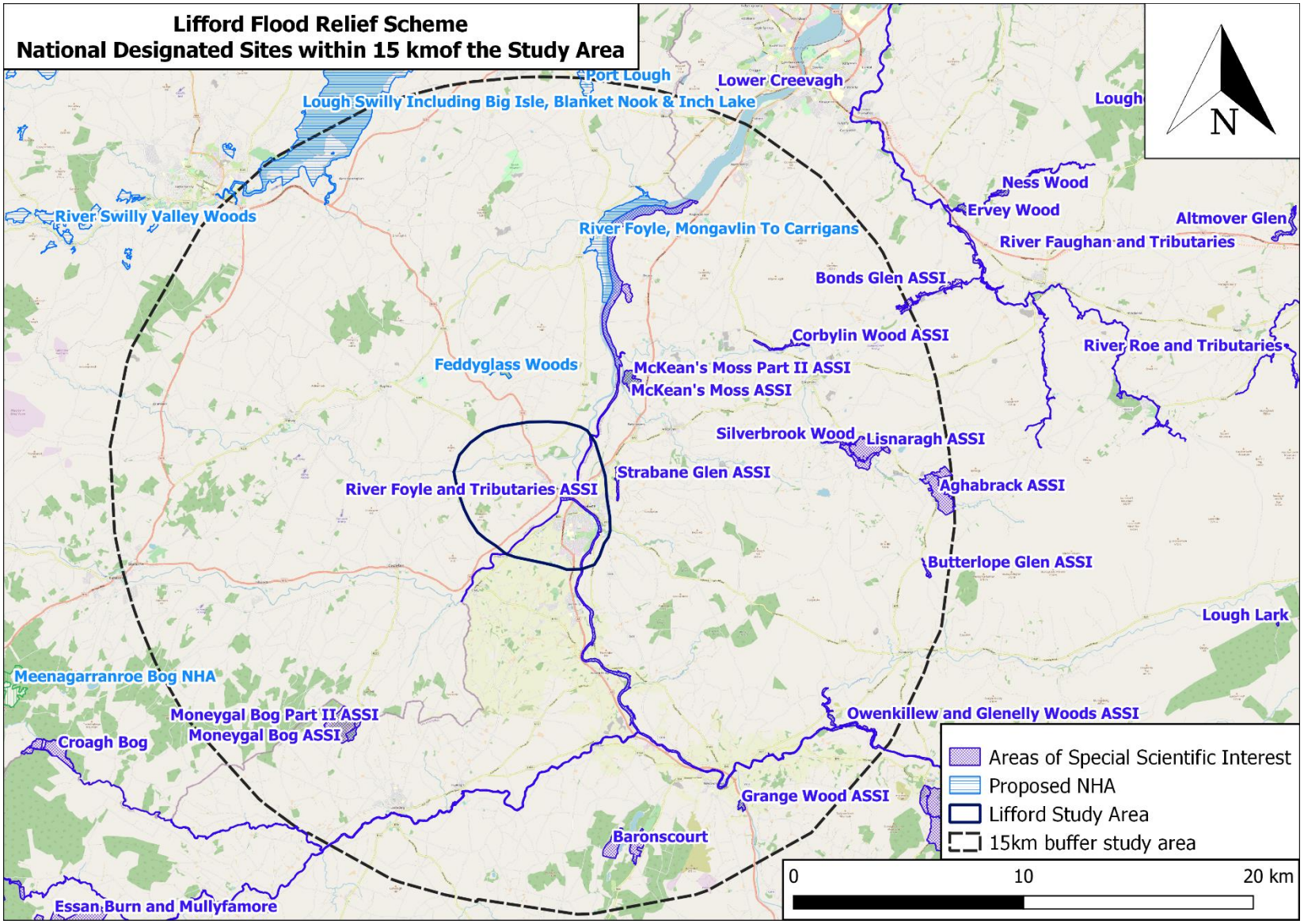


**Figure 4-2: National Designated Sites within 15km of the Study Area**

#### 4.4.2.3 Non-Designated Features of Ecological Interest

The flood relief scheme is centred on the urban zone of Lifford where the confluence of four watercourses can be a flashpoint of flooding in the area. To the west of Lifford, agricultural lands are the dominant landuse feature, while directly across the river Strabane comprises of a larger urban area. Agriculture in the area includes intensive grassland management for livestock, as well as crop rotations of cereal and potatoes. These lands are located in the river valleys of the Swilly Burn and the River Deele. Some of these lands are occasioned by flocks of Whooper Swans and Greylag Geese in the winter season, such as in the Feddyglass area or northwards at Porthall. These migratory species are broadly dispersed between the Lough Foyle and Lough Swilly estuaries and wetlands where agricultural lands such as poldars are a very important component of the habitat to large numbers of winter migrants. Just north of Lifford, the Roughan (Bog) area is said to be of some local importance for wintering wetland birds (pers comms from Shane McMonagle, DCC). The use of these farmlands and semi-natural habitats by wintering birds near the proposed Lifford FRS may be seen as a potential constraint to the route and design layout of the scheme.

#### 4.4.2.4 Rare and Protected Flora (Flora Protection Order)

National Biodiversity Data was checked for records of species listed under the Flora (Protection) Order, 2015 to find which rare or unusual plant species had been recorded in the 10 km squares in which the study area is situated (C30, H29, H39). Two species protected under the Flora Protection Order were recorded in these hecteds. These species are listed below:

- Haller's apple-moss (*Bartramia hall eriana*)
- Spruce's bristle-moss (*Orthotrichum sprucei*)

Both species were recorded in hected H39. Haller's apple-moss was recorded downstream of the study area in Strabane. Spruce's bristle-moss is located upstream of the flood scheme on the Strabane side.

#### 4.4.2.5 Bird Data

'*The Atlas of Breeding Birds in Britain and Ireland*' *(Sharrock, 1976)*, '*The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991' (Gibbons et al., 1993)*, '*The Atlas of Wintering Birds in Britain and Ireland' (Lack, 1986) and Bird Atlas 2007-2011 (Balmer et al.,2013)*' were consulted for information on distribution of birds in Ireland. They provide generic data to monitor long-term population trends at national and international level (Appendix C1)

A shortlist was compiled of species recorded from the relevant 10 km squares (C30, H29, H39) that are protected in Annex I of the EU Birds Directive, or subject to serious population declines in the Birds of Conservation Concern in Ireland (BoCCI) red list. It narrows the search for species of high conservation importance that may occur near the siting of the proposed FRS.

Six Annex I wintering species include Whooper Swan (*Cygnus cygnus)*, Kingfisher (*Alcedo atthis)*, Hen Harrier (*Circus cyaneus)*, Merlin (*Falco columbrarius)*, Greenland White-fronted Goose (*Anser albifrons)* and Golden Plover (*Pluvialis apricaria)*. Whooper Swan winter on large

waterbodies and the surrounding grasslands and may be found within the study area. Kingfisher expands its winter wetland habitats area over breeding habitats and may be found in the area. Some of the banks along the rivers within the study area may be suitable for Kingfisher, which require muddy banks close to water for nesting.

A further five bird species, listed on the BoCCI Red list, winter in the area and include Lapwing (*Vanellus vanellus*), Curlew (*Numenius arquata*), Yellowhammer (*Emberiza citronella*), Black Headed Gull (*Larus ridibundus*) and Herring Gull (*Larus argentatus*). Lapwing winter on farmland, wetlands and flat coastal areas. Yellowhammer winter on agricultural land with tillage, good hedge and scrub habitats. Black Headed Gull winter on a variety of habitats and Herring Gull winters on lakes, estuaries and open fields. All the above species may potentially occur within the study area.

During the baseline ecological survey undertaken on the 19th May 2020, a pair of Grey Wagtails (*Motacilla cinerea*) were observed feeding fledged young perched on boulders along the River Foyle at the waterfront in Lifford. It is likely that this species are breed along the waterfront in a gap or ledge in masonry facing the river. This protected resident species is on the BOCCI red list. Three Mallard were also noted on the river at Lifford. Several Herons were noted feeding near the River Finn along the 2km stretch upstream of Lifford.

Several of the above-mentioned species of conservation importance known from the study area of the Lifford FRS, both wintering and breeding, could potentially be a constraint to the development of the FRS. However, without recent data on current status, location and habitats of importance, it is not possible to determine or evaluate the situation further. Further field surveys of both wintering and breeding species in the study area will be required.

#### 4.4.2.6 Fauna

The NPWS records of protected species in the area of the proposed scheme were obtained for the relevant 10 km squares (C30, H29, H39). Protected species of note in the study area are provided in Appendix C2.

Otter

Otter (*Lutra lutra*) is a Qualifying Interest (QI) of the River Finn SAC due to its inclusion in Annex II of the Habitats Directive and thereby is subject to conservation objectives, parameters and measures for habitat protection to maintain its conservation status in the SAC and in the country. The Eurasian otter is classified as 'near threatened' by the IUCN (2006) and is listed as a strictly protected species in Appendix II of the Bern convention (Council of Europe, 1979). In Ireland Otter was afforded legal protection under the Wildlife Act 1976, strengthened by the Wildlife Amendment Act (2000) making it entirely illegal to hunt, disturb, or intentionally kill otters; it is listed as internationally important in the Irish Red Data book (Whilde, 1993).

Otter is recorded in all relevant 10km squares, C30, H29 and H39, concerning presence in the rivers Finn, Foyle and Deele relative to the study area. During the field survey undertaken on the 19th May 2020 an Otter was observed in daytime foraging / feeding in the River Foyle and evidence of Otter occurrence was obtained from c.2km upstream on the River Finn. There is suitable habitat for Otters, including for breeding purposes along all watercourses within the

study area. Otters may travel along minor or culverted watercourses and use features set back from the river such as banks and thickets as resting places or to create breeding holts. The confirmed occurrence of Otters in rivers and suitability of habitats within the study area give rise to an important constraint to the scheme proposals. Further detailed survey of Otter occurrence, habitats use and breeding status relative to the study area is required to evaluate further. The design of the Lifford FRS will need to take account of potential impacts on Otters in terms of noise, disturbance and disruption, prey availability, potential impacts on resting areas/holts and potential impacts on movement of otter along watercourses.

Bats

All species of bat in Ireland are protected under the Wildlife Protection Act of 1976, the Wildlife (Amendment) Act 2000, and are listed in Annex IV of the EU Habitats Directive, and accordingly protected under the European Communities (Natural Habitats) Regulations 1997, making it an offence to deliberately disturb a bat, damage or destroy a breeding site or resting place of a bat. A number of bat species have been recorded within the study area in H39 including Pipistrelle spp (*Pipistrellus* spp), Daubenton's Bat (*Myotis daubentonii*) and Lesser Noctule (*Nyctalus leisleri*), also called Leisler's Bat. The habitats in and around the study area and rivers provide suitable foraging, commuting and resting locations for bat species including old buildings, walls, bridges, trees/scrub and open water (foraging), particularly along the waterfront of Lifford. The possibility that construction of the Lifford FRS could disturb, damage or destroy habitats, including breeding and winter roost sites, gives rise to a significant constraint consideration in design of the scheme route and options. Further detailed surveys and studies are required to establish the status of these and other bat species relative to the scheme options being considered or developed.

Invasive Species

Invasive alien species are defined and subject to legal controls, measures and restrictions by EU Regulation No. 1143/2014 and in Ireland, Regulation S.I. 477 of 2011 (Third Schedule: Non-native species subject to restrictions under Regulations 49 and 50). The NPWS records of species listed as invasive in the area of the proposed development were obtained for the relevant 10 km squares (C30, H29, H39). These records from NPWS and NBDC are presented in Appendix C3.

During site walkovers undertaken on the 11th March and the 19th May 2020, stands of Japanese Knotweed (*Fallopia japonica*), Giant Hogweed (*Heracleum mantegazzianum*) and Himalayan Balsam (*Persicaria wallichii*) were identified along the River Finn, the Foyle and the Deele River. Most of the infestation is concentrated in the Lifford area, near and along the banks of the River Foyle. These species are all subject to legal controls and require treatment programmes to achieve eradication. Concentrations of Giant Hogweed in private or other state organisation properties represent a risk of new infestations spreading into the scheme area, unless coordinated treatment programmes are accomplished.

Asian Clam (*Corbicula fluminea*) is an invasive alien species of aquatic mollusc that is established in the River Foyle downstream of Lifford (see 4.4.2.7 below) whereby any instream works must be carried out in compliance to measures that prevent its spread within the river environment or

to waterbodies elsewhere. Invasive species represent an important constraint to the scheme construction and maintenance.

#### 4.4.2.7 Aquatic Ecology

Water Quality

The EPA website https://gis.epa.ie/EPAMaps/Water, provides information regarding water quality based on this monitoring. The Rivers Finn, Foyle and Mourne fall under Northern Ireland jurisdiction and as such information regarding water quality in these waterbodies was obtained from the Northern Ireland Environmental Agency (NIEA) website https://appsd.daera-ni.gov.uk/RiverBasinViewer/.

The overall status of the waterbodies that are shared between the Republic and Northern Ireland are jointly agreed to by the two jurisdictions. Information is provided in the form of Q values. Q Values are used to express biological water quality and are based on changes in the macro invertebrate communities of riffle areas brought about by organic pollution. Q1 indicates a seriously polluted water body and Q5 indicates unpolluted water of high quality. A value of Q 3 indicates moderately polluted water.

The NIEA report concluded that water quality scores in the River Finn, the River Mourne and Upper River Foyle were Q3 'Moderate' in 2015.

The EPA report concluded that water quality in the River Deele was 'Unassigned' in 2018. Constraints associated with water quality status and trends are considered in section 4.5 below.

Fish Species and Fisheries

The study area forms part of the wider Foyle river system which is administered by the cross-border authority, the Lough's Agency. The Foyle is known as one of the most productive salmon and trout river systems in the world with some of the best angling water in Ireland. Annual freshwater fisheries monitoring programmes for the Foyle catchment are undertaken by the Loughs Agency. The latest catchment status publication (2018) for the Foyle records Brown Trout (*Salmo trutta*), Salmon (*Salmo salar*) and Sea Trout (*Salmo trutta trutta*) in the Rivers Finn, Deele, Mourne and the Foyle. Additional species recorded in the study area include Eel (*Anguilla Anguilla*), Three-spined stickleback, Pike, Perch, Lamprey sp. (River, Brook and Sea) Smelt (*Osmerus eperlanus*) and Roach.

Atlantic salmon is listed in Annex II of the EU Habitats Directive as a species of European importance. The species is featured in Ireland's National Biodiversity Plan (2011) which includes a series of actions aimed at restoration of stocks. In the UK, it was added to the UK Biodiversity Action Plan (BAP) list in 2007 as a priority species for conservation action. The River Finn is a designated salmonid river under the (SI 289 of 1988) European Communities (Quality of Salmonid Waters) Regulations.

A preliminary consultation meeting with the Lough's Agency personnel was carried out on the 23rd September 2020. Key points made during this consultation is provided below and further in Appendix C4.

- Lamprey and Smelt spawn close to Lifford (lower River Finn). These are species of high conservation importance, even if not specifically listed for protection in relation to the SAC.
- During a survey for European Smelt on the tidal River Foyle in March 2016, the invasive alien species of aquatic mollusc, Asian Clam (*Corbicula fluminea*), was identified by the Loughs Agency. A baseline survey of abundance and distribution found its occurrence limited to the area around Corkan Island downstream of Strabane/Lifford. This species poses a threat to Salmon spawning and breeding success and to the native aquatic ecosystem, within a European Site. It can be spread by anthropogenic interaction/interference, such as via machinery surfaces in construction activities. It can remain viable on surfaces for two weeks and gives rise to a need for very high biosecurity measures. This will be a considerable constraint to any instream required to construct the potential scheme option.
- The River Foyle at Lifford is a very important location in the migration of Salmon, where returning adults require unrestricted mobility into natal breeding grounds of either the Finn or the Mourne/Strule river systems. In stream works would be seen as unfavourable to conservation of Salmon in the spawning season, or during the return migration of smolts (juveniles) downstream in Spring. In addition, the uncompromised migration of other fish species, in particular Lamprey, Eels and Smelt is also an important concern. The Loughs Agency regard the nature and timing of works to be a likely impact issue and is therefore highlighted as an important constraint in relation to the possibility and planning of instream works along the Finn and Foyle at Lifford.

### 4.4.3 Summary of Key Constraints and Implications for the Proposed Scheme

#### 4.4.3.1 Main Findings

- The rivers within the Lifford study area are collectively of high ecological significance and importance for migratory fish including Salmon and a range of other threatened species or listed on Annex II. There is potential for these watercourses to be important for fish and also provides habitat for a range of other species listed on Annex II of the EU Habitats Directive and Annex I of the Birds Directive including Otter, Salmon and Kingfisher.

- The invasive plant species, Giant Hogweed (*Heracleum mantegazzianum*), Japanese knotweed (*Fallopia japonica*) and Himalayan balsam (*Impatiens glandulifera*) are prevalent within the study area. The invasive Asian Clam is known to occur in the River Foyle near and downstream of Lifford. Their collective existence represents an important constraint to the scheme location and development, requiring effective measures to control and prevent adverse impacts involving these species.

#### 4.4.3.2 Key Constraints

- The sensitivity of the waterbodies and designated sites within the study area has no significant detail. There will most likely be effects of the function of the watercourses due to an effect on water flow. These will need to be addressed to ensure that the negative effects are minimised and mitigated.

- The areas in and around the Deele, Finn, Foyle and Mourne waterbodies provide suitable habitats for breeding or resting locations for otter. When the details of the works option is decided upon, the areas to be affected require additional survey to determine the level of otter activity and if any breeding or resting places are present within and adjacent to the

footprint of the works. Works could result in the damage or destruction of resting places and appropriate mitigation will be required to ensure no long-term adverse impacts on local otter populations. Appropriate licences may also be required from NPWS in relation to any works on or around otter breeding or resting places.

- The Foyle catchment is important for salmonid and other fish populations. In-channel works, or permanent modification of channel banks or bed, could have an adverse impact on aquatic populations and water quality. This could arise directly through damage to in-channel habitats or indirectly through impacting upon water quality. Timing constraints will apply to any in-channel working to avoid the salmonid spawning season (usually between November and March) and the Loughs Agency must be consulted during the design stage, prior to works commencing. Appropriate measures shall also be required to prevent pollution incidents and silt mobilisation. This is particularly important for Atlantic salmon as it is a qualifying interest of the River Finn SAC and River Foyle and tributaries SAC.
- The scheme design should take into consideration the potential impacts from loss of riparian habitat which provides food, cover and shade and helps to stabilise river banks. Significant impacts on fish populations and macroinvertebrates populations could occur due to such loss of habitat.
- The mobilisation of high levels of silt as a result of construction within rivers can impact spawning habitats. Excessive siltation can cause eggs and fry to be smothered. Spawning salmonids and lamprey are likely to avoid traditional spawning areas due to excessive silt deposits.
- The riparian corridor and vegetated fringe of the study area watercourses provides suitable habitat for nesting birds and also within the river walls in Lifford town that provide a number of cracks and crevices suitable for nesting birds. If possible, vegetation clearance associated with the works and any works to existing walls, should be conducted outside of the breeding bird season (March to September inclusive) to protect any nests that may be present. If this is not possible, working areas should first be searched by a suitably qualified ecologist for the presence of any nests. If found, the nests should not be disturbed until the chicks have fledged and the nest is deemed inactive. A possible ecological opportunity as part of these works will be to include nesting boxes.
- Trees along the study area watercourses, river walls and old buildings in Lifford town and the Lifford bridge provide potential roosting opportunities for bats, with the surrounding habitat providing good foraging and commuting routes. Options that require the removal of riparian mature trees or works to built structures with the potential to support roosting bats shall be assessed for bat potential. The optimum time to carry out bat surveys is May-August inclusive. If bats are found to be present the surveys will determine the species, numbers, access points and type of roost. If a hibernation roost or maternity roost is found, they shall not be disturbed during the hibernation or maternity periods.
- There is potential for fragmentation and degradation of existing habitats as a result of the proposed flood relief scheme infrastructure. Potential loss of habitats and connectivity between habitats may include loss or damage to hedgerows and tree lines which are important wildlife corridors for numerous species particularly bats and badger. It will be necessary to ensure that movement of species between ecological sites are not impaired by

the Flood Relief Scheme. Any loss of corridors should be mitigated through the reinstatement and planting of additional corridors after construction.

- In the design of the proposed scheme, consultation with both the Loughs Agency and NPWS will be necessary, together with an appropriate amount of survey work to establish baseline conditions in the study area watercourses. Constraints may be placed on the times of year that works in the proximity of the SAC may be carried out depending on the results of the various surveys and the requirements of the Loughs Agency and NPWS. Constraints may also be placed on the time of year/weather conditions that the surveys may be undertaken.
- It must be ensured that there are no significant impacts on Natura 2000 sites (SAC/SPA). The River Finn SAC and River Foyle and Tributaries SAC are directly adjacent to the proposed flood relief scheme. There is potential to negatively affect the status of these designated sites.
- Japanese knotweed, Himalayan balsam and Giant Hogweed are listed as invasive plants under the EC (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011). These regulations prohibit the introduction and dispersal of these species. Therefore, the works associated with the flood relief scheme in areas where invasive species are present must use appropriate measures to ensure their containment. Appropriate measures should be taken to ensure that the spread of these invasive species is not initiated or extended by any proposed works. An Invasive Species Management Plan will be required for the treatment of Giant Hogweed, Japanese knotweed and Himalayan balsam and other invasive species in a safe and environmentally acceptable manner.

## 4.5 WATER

This section examines the existing hydrological environment of the study area and environs regarding the potential arising as a result impacts of the Lifford Flood Relief Scheme (FRS).

### 4.5.1 Methodology

Identifying potential hydrological constraints involved a desktop review of information, including:

- EPA water quality database and maps
- NIEA water quality database and maps
- Well card data compiled by the Geological Survey of Ireland (GSI)
- OPW Database of Hydrometric Stations
- North Western River Basin District Management Plan (2009 – 2015)
- Foyle Catchment Assessment 2010-2015 (HA 01) EPA
- River Basin Management Plan for Ireland (2018 – 2021)

### 4.5.2 Receiving Environment

#### 4.5.2.1 Water Supply

Existing River Abstractions

There is no record of surface water abstraction from the Rivers Foyle, Finn, Mourne and Deele within the study area. The water is supplied to the town form the Argery reservoir and Lifford Town Reservoir which are supplied from Lough Mourne Water Supply Scheme.

Existing Groundwater Abstractions

Well card data produced by the Geological Survey of Ireland (GSI) indicates that there is one dug well and three boreholes within the study area. These are used for potable water supply and agricultural purpose. One of the boreholes identified by GSI is for domestic use only and two of the boreholes are identified for other uses.

There is one groundwater abstraction within the study area in the form of a shallow dug well, most likely for agricultural use. The location of these boreholes and well are shown on Drawings D1 and D2 in Appendix D. Historical mapping was checked for information on historic wells and show several wells within Lifford (Drawing D3 Appendix D).

#### 4.5.2.2 Hydrometric Stations

There are two hydrometric stations located within the study area on two of the four study area watercourses, the River Deele and the River Mourne. Both hydrometric stations are located upstream of the proposed flood defence measures.

The hydrometric station located within the study area on the River Deele is the Ballindrait (1048) station. This station is currently inactive and no continuous water level or flow records are available. This station is a staff gauge and spot flow measurements are available. There is another station on the River Deele upstream of the study area at Sandy Mills which measures water levels and flow.

The hydrometric station located within the study area on the River Mourne is the Drumnabouy House (201010) station. This station is located on the upper reaches of the river within the study area and is owned by the Rivers Agency NI. This station is currently active and measures water levels and flow.

There is a hydrometric station on the River Finn upstream of the study area at Clady Alert. This station is currently active and is owned by the Rivers Agency NI. This station measures water levels only.

#### 4.5.2.3 Surface Water features

Information obtained from the EPA and NIEA website in relation to national monitoring stations located within the study area including their biological date and surface water quality standards are provided in Appendix D4.

Water Framework Directive

The European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. 272 of 2009) and the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. 9 of 2010) establish the legal framework needed to implement the environmental objectives of the WFD. They lay down the criteria and environmental quality standards for classifying water status and impose an obligation on public authorities to take the necessary steps to achieve the objectives set out in river basin management plans.

The River Basin Management Plan (2018-2021) (RBMP) outlines Irelands approach to protecting and improving rivers, lakes, estuaries and coastal waters in line with the objectives of the Water Framework Directive (WFD). The main objectives of the RBMP plan are;

- To ensure full compliance with relevant EU legislation,
- Prevent deterioration,
- Meet the specific water related objectives for designated protected areas,
- Protect and restore high-status objective waters,
- Implement targeted actions and piolet schemes in focused sub-catchments aimed at;
  - (1) targeting waterbodies close to meeting their status improvement objectives during this cycle of the RBMP and,
  - (2) addressing sub-catchments with more complex issues that will build knowledge for third cycle.

The RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of these waterbodies and also identifies those waterbodies that are at risk of not meeting the objectives of the WFD and the pressures causing this risk.

The study area is located within the Water Framework Directive (WFD) North Western International River Basin District and the management plan for this area was consulted. The main objectives of this management plan were to prevent deterioration, restore good status, reduce chemical pollution in surface waters and to achieve water-related protected areas objectives. The programme of measures designed to achieve these objectives are outlined in this document and include the following:

- Control of urban waste water discharges
- Control of unsewered waste water discharges
- Control of agricultural sources of pollution
- Water pricing policy
- Sub-basin management plans and programmes of measures for the purpose of achieving environmental water quality objectives for Natura 2000 sites designated for the protection of Freshwater Pearl Mussel populations
- Pollution reduction programmes for the purpose of achieving water quality standards for designated shellfish waters
- Control of environmental impacts from forestry

Information on status, objectives and measures in the North Western RBD has been compiled for smaller, more manageable geographical areas than river basin districts. The study area lies within the Foyle catchment, a cross border catchment with a surface area of 2,919km$^2$. The Foyle catchment comprises nine sub-catchments with forty-one river waterbodies, five lakes, one transitional water body and eight groundwater bodies. More specifically the study area is located in the Finn [Donegal]_030 and Deele [Donegal]_010 sub-catchments. These sub-catchments have been assessed as part of the national characterisation programme undertaken for the second cycle of WFD RBMP.

The Finn [Donegal]_030 sub-catchment consists of six river waterbodies, five groundwater body and one transitional waterbody. Six of these waterbodies have been identified as being 'At Risk' and the report identifies the following pressures within the sub-catchment that are resulting in these 'At Risk' statuses;

- Wastewater treatment plants and septic tanks pose significant impact with non-compliance in this sub-catchment,
- Chemical pollution from sheep dip in the upper reaches of the sub-catchment,
- Peatland activity is a major pressure in the west of the sub-catchment, with pasture being the main agricultural activity, along with acidification impacts and potential siltation from forestry planted on peat.

The status of the River Finn within the study area in the sub-catchment assessment report is currently under review due to its unassigned status.

The Deele [Donegal]_010 sub-catchment consists of six river waterbodies, five groundwater body and one transitional waterbody. Two of these waterbodies have been identified as being 'At Risk' and the report identifies the following pressures within the sub-catchment that are resulting in these 'At Risk' statuses;

- Increase in phosphate concentrations in 2013 and 2014.
- The wastewater treatment plant present within Deele (Donegal)_030 is overloaded with no secondary treatment so therefore may be impacting waterbodies.
- Diffuse agriculture (i.e. pasture) may be also affecting nutrient levels in Deele (Donegal)_040 and 050.

- A wastewater treatment plant is also present in 050 and is overloaded with no secondary treatment, but is discharging to the estuary. While there are chemistry data available for this water body, due to the location of the monitoring station, this data may not provide information as to whether there is an impact from this pressure.
- Channelisation and embankment within this water body also has the potential to degrade habitat conditions.

The status of the Deele (Donegal)_050 within the study area in the sub-catchment assessment report is currently under review due to its unassigned status.

#### 4.5.2.4 Hydrogeology

The Geological Survey of Ireland (GSI) and Geological Survey of Northern Ireland (GSNI) online databases shows the study area as being underlain by two main aquifer types. Poor bedrock aquifers with pelitic and psammitic schist, phyllite and marble, meta-dolerite, meta-gabbor and quartzite occupies the majority of the study area with a small pocket above the River Deele having locally important aquifer with psammitic and pelitic schist, marble, amphibolite and diamictite. An extract from the online databases (GSI and GSNI) is included in Appendix D Drawing D5 showing the location of the aquifers in the study area.

The GSI online database has no records of karst features within the study area. The direction of groundwater flow is influenced by the topography of the surrounding area. Groundwater within the study area is likely to be hydraulically connected to the River Finn and Foyle and their tributaries.

An 'At Risk' groundwater body is impacted by Churchtown closed landfill licenced waste facility (WL62-01) the key parameter is Ammonia.

### 4.5.3 Summary of Key Constraints and Implication for the Proposed Scheme

- The design of the proposed flood relief scheme should take into account the main objectives of the Water Framework Directive River Basin District Management Plan (RBDMP) by ensuring that any works proposed do not result in the deterioration of water quality of any watercourse in the study area and where possible contribute to the achievement of "Good" (Q4) status within the study area. This represents a key constraint to the scheme development options in view of potential construction impacts to river water quality and habitats.
- The construction phase of the scheme has the potential to impact on the water quality of the study area watercourses through:
  - Release or run-off of suspended solids from site preparation or development of construction
  - Accidental release of cement or contaminated materials from the site to the study area watercourses
  - Unintentional discharge of oil/diesel from the site to the study area watercourses
- A Construction Environmental Management Plan will be required before commencement of any construction works and be approved in advance by the NPWS and the Loughs Agency.

- The Flood Relief Scheme has the potential to impact on the hydrology and morphology of the study area watercourses. It is recommended that the hydrological regime of all waterbodies which might be affected by the scheme are fully considered to ensure that the WFD hydro-morphological status is not affected by the scheme.
- The scheme should take into consideration the presence of protected water resources and water dependant terrestrial ecosystems. In particular the designation of the River Finn SAC for Salmon (QI) and as a Salmonid River. The SAC Conservation Objectives set water quality targets and standards; e.g., Q4 for Salmon. The WFD targets the Finn and Foyle catchment for achievement of a Q4 status by 2027. The Lifford FRS proposal may be viewed as a constraint to achieving the outcome of these directives objectives in the given time-frame. In this regard it is a constraint to scheme development options.
- The hydrology of Lough Foyle should be assessed to determine any changes likely to occur such as an increase in freshwater flows downstream and to the Lough associated with the scheme. Any change in the hydrology could result in wetland habitat changes downstream in Mongalvin to Carrigans NHA, the Foyle and Faughan Estuaries SAC and the Lough Foyle SPA. Conservation objectives for these designated sites include the maintenance of these wetland habitats in order to support their qualifying interests.
- Hydro-morphological character, heterogeneity and related features must be considered in relation to changes or potential impacts resulting from construction and maintenance of the given scheme options. Features such as sand, sediment, gravel and cobble banks and deposits are integral to river and aquatic ecology and biodiversity, water quality and the conservation objectives and qualifying interests of the River Finn SAC. The tendency to remove such features for the purposes of channel maintenance and conveyance may be contrary to nature conservation and WFD objectives and thus be a constraint to pursuance of these elements in the course of the scheme design and construction.
- The removal and disposal of any river/estuarine sediment should follow the guidelines for handling waste under the Waste Management Acts as amended. A strict chain of custody must accompany all excavated materials taken off site for disposal.
- A historic landfill site, thought to date back to the 1960s or earlier has been identified at the Roughan. Historic and current mapping indicates there is a central drain watercourse running east to west through the site that discharges via a local (agricultural land) drainage network to the Deele. Monitoring for residual leachate effects on surface and groundwater is now advisable to ascertain the ongoing legacy effects on water and the surrounding environment. The standard list of chemical components, phosphate, ammonia / ammoniacal nitrogen, including metals, hydrocarbons, VOCs should be considered. The site will be subject to further assessment in terms of contaminated land. The possibility that disturbance (excavation) of terrain at or near the former refuse dump would cause a release of contaminants to water is a constraint to the development and selection of route options for the Lifford FRS.
- Churchtown Landfill - Waste Licence ref. W0062-1 for Churchtown Landfill Site, located >2km upstream of Lifford along the south bank situated in the lower alluvial flood plain of the River Finn. The site closed on 31st August 2000. The Annual Environmental Report (AER) for the site indicates leachate to drain to the river and has ongoing effects. RPS compiled

the AER in published in 2019. The existence of this pressure on the River Finn SAC, in view of the '*At Risk*' status (WFD) and the objectives to restore the river to Q4 'Good' status by 2027, places constraint on the Lifford FRS to limit impacts that would prevent the achievement of the objectives of the WFD and the Habitats Directive with regard to water quality improvement targets and objectives.

## 4.6 SOILS AND GEOLOGY

This section describes the soils and geology underlying the study area for the Lifford Flood Relief Scheme.

### 4.6.1 Methodology

The section describes the bedrock geology, superficial deposits, economic geology and geological heritage of the Constraints study area identified from desktop information sources only. An inventory of the geological constraints identified by this desktop study is detailed below.

Soils and Geology constraints within the study area are assessed with reference to the following:

- The Geological Survey of Ireland (GSI) online database
- Donegal County Council Planning Department (Quarries Register under Section 261, Planning and Development Act 2000),
- County Donegal Development Plan (2018 - 2024)
- Concrete Products Directory (Irish Concrete Federation)
- Aerial Photographs
- ENVision Mines Site, the EPA's online Historic Mines Inventory

### 4.6.2 Receiving Environment

#### 4.6.2.1 Bedrock Geology

Geological Survey of Ireland (GSI) indicates four main bedrock types underlay the study area:

- Meta-dolerite, meta-gabbro;
- Argyll group- Amphibolite & amphibolitic schist;
- Argyll group- Psammitic & pelitic schist, marble, amphibolite, diamictite;
- Southern Highland group- Pelitic & psammitic schist, phyllite & marble.

Pockets of Metalimestone and Igneous Intrusions were also recorded in the study area.
Subsoils within the study area comprise Metamorphic till with pockets of Alluvium, Bedrock at surface level, Glaciofluvial sheet deposits, Tidal flat deposits, Made-ground and a pocket of Metamorphic sands and gravels. Appendix E Drawings E1 and E2 contains extracts from the GSI Online Database showing the geology in the study area

In addition to the above information regarding the bedrock geology of the of the study area GSI provided comments on the proposed Flood Relief Scheme for constraints stage. A summary of which is provided below:

'*The primary issue raised by GSI in relation to the proposed scheme, as outlined in the preferred option of the CFRAM study, is that the River Foyle and part of Lifford town is underlain by an*

*alluvial deposit that is thought to be coarse-grained and permeable throughout most of its depth in this vicinity. It is possible that the deposit is hydraulically connected to the River Foyle allowing water to move laterally through. This should therefore be taken into account in considering the scheme design and alignment as the deposit may enable water to bypass proposed hard defences.'*

This consideration is regarded as a potential constraint to the FRS.

#### 4.6.2.2 Economic Geology

The term 'economic geology' refers to commercial activities involving soil and bedrock. The activities involved principally comprise aggregate extraction (sand and gravel pits and quarries) and mining. For economic geology, the following sources were examined for information on commercial activities within the study area:

- County Donegal Development Plan (2018 - 2024)
- Concrete Products Directory (Irish Concrete Federation)
- Aerial Photographs
- ENVision Mines Site, the EPA's online Historic Mines Inventory
- Local knowledge

These sources revealed no registered mining activity in the study area. McKean Sand quarry is located to the north, along Lough Foyle downstream of Lifford outside of the study area. An unlicensed quarrying operation involving the direct extraction of sand, gravel, silt and clay from the bed of the River Foyle is taking place on the island known as Islandmore (Corkan Island), north-east of Lifford within the study area. It is reported that as of 2010, the area of known extraction along the southern boundary of Islandmore extends to 21.6ha and extraction is by digger from the river bed. There is potential risk of contamination of ground water of the existing compound to the adjoining watercourse within the River Finn SAC. At the time of writing this report no EIA for these quarrying activities have been undertaken. Due to the location and problematic nature of the activity, it is viewed as a constraint to scheme development.

#### 4.6.2.3 Geological Heritage

The County Donegal Development Plan (2018 - 2024) states 'Geology is recognised as an intrinsic component of natural heritage within the Planning and Development Acts 2000- 2015, Planning and Development Regulations, Heritage Act 1995, and the Wildlife (Amendment) Act, 2000'. The Development Plan identifies 114 sites of geological and geomorphological interest in the county which could potentially become either geological Natural Heritage Areas (NHA) or County Geological Sites. None of the 114 sites are located within the study area.

#### 4.6.2.4 Contaminated land at the Roughan, Lifford

Lorraine Arbuckle (DCC) identified a historical refuse tip for local municipality, that is located in the Roughan, a townland on the north side of Lifford within the study area. This site was identified during a walkover survey to examine flood event records with Eugene McCosker who is from the area and a good source of local knowledge in the context of the Lifford FRS. It appears that a historical brick works extracting alluvial clay for brick making, left an open pit

that was subsequently used to contain a refuse tip during the c.1960s/70s. This is located close to a potential alignment of flood defence embankment within the scheme. The issues under consideration are the stability and relative firmness of the substrate and the characteristics of the residual contamination of the site. The precise location and extent of the site area have yet to be established by a site investigation survey (SI) involving trial pits. This occurrence represents a significant constraint to the scheme and requires urgent evaluation to determine the implications.

### 4.6.3 Summary of Key Constraints and Implication for the Proposed Scheme

- It is recommended that a preliminary geotechnical investigation be carried out once viable flood risk management measures are developed in order to identify geology and ground conditions, particularly in view of the coarse-grained alluvial clays associated with the Foyle.
- Contaminated land at a historic refuse landfill site is coincident with the potential scheme defences at the Roughan, Lifford. This requires site investigation and evaluation.
- Permanent or temporary removal of soils/excavation of bedrock may be necessary during the construction of the Flood Relief Scheme which could potentially impact bedrock and alter drainage patterns. Ground conditions within the study area will be identified through geotechnical investigation during the next stage of scheme development
- Consideration needs to be given to the permeability of the bedrock geology within the study area while developing the design of the viable flood risk management measures.
- There is potential risk of contamination of groundwater through spills or leaks from hazardous substances used on site during construction. Best site practice should be implemented on site and appropriate mitigation measures should be implemented where works are hydrologically connected to groundwater bodies.

## 4.7 ARCHAEOLOGY, ARCHITECTURAL AND CULTURAL HERITAGE

This section summarises the known archaeological and built heritage constraints within the study area of the Lifford Flood Relief Scheme as identified in the desk-based Heritage Screening Report.

### 4.7.1 Methodology

As part of this constraints report, a desk-top study of the archaeological, built and cultural heritage resources within the study area was undertaken. This information provides an insight into the development of the study area and an evaluation of both recorded archaeology and built heritage as well as the potential for impacting on previously unrecorded archaeology. The principal sources reviewed for the archaeological resource were the Northern Ireland Sites and Monuments Record (NISMR) and the Record of Monuments and Places (RMP) for the Republic of Ireland. The Record of Protected Structures (RPS), as published by Donegal County Council and Historic Buildings register for Strabane were reviewed in order to identify relevant architectural heritage in the study area. The following sources were also consulted:

- Topographical files of the National Museum of Ireland as identified on Heritagemaps.ie
- Cartographic & Aerial Photographic Archive of the Ordnance Survey of Ireland – www.osi.ie
- National Inventory of Architectural Heritage – Survey of the Architectural Heritage of County Donegal (NIAH) – www.buildingsofireland.ie
- Annual Archaeological Excavations Bulletin – www.excavations.ie
- The Archaeological Survey of County Donegal (1983)
- Draft County Donegal Heritage Plan (2014-2019)
- Donegal County Development Plan 2018 – 2024.
- The Dúchas Project (DoCHG).
- The National Folklore Collection (UCD).

A list and associated maps of all protected archaeological, architectural and cultural heritage sites within the study area are included in Appendix F (1-6).

Intangible cultural heritage, folklore and local history sources were also considered in the Heritage Screening report issued as a baseline study for this project in September 2020[1].

### 4.7.2 Receiving Environment

The tables presented in Appendices F (1-6) provide lists of the protected archaeological and architectural heritage sites within the study area. There are 42 recorded sites or monuments within the study area in Co. Donegal and two sites in Co. Tyrone. These include three megalithic tombs dating to the Neolithic period (c.4600-2400BC), 15 standing stones of probable Bronze Age date (c.2400-600BC) and the later medieval fortification and historic town of Lifford (early 17th century).

The key constraints that are protected by legislation comprise protected structures and recorded archaeological monuments/sites. There may be some overlap between these two categories as built structures can occasionally be listed in both the RMP and RPS.

[1] *Lifford FRS – Archaeology & Built Heritage Screening Report*; Ryan Hanley, Issued September 2020

The County Donegal Development Plan contains the following objectives pertaining to the protection of the Archaeological & Built Heritage in the county:

"*AH-O-1: To conserve and protect the County's archaeological heritage for present and future generations.*"

"*BH-O-1: To preserve, protect, enhance and record the archaeological heritage of the County.*"

It is recommended that, where possible, the scheme be designed to avoid any impacts on the archaeological & built heritage as illustrated in Appendix F (1-6).

Given the provisions of the National Monuments Acts, no disturbance or interference to any archaeological sites/monuments listed in the RMP can take place without prior consultation with the Dept. of Housing, Local Government & Heritage through the Development Applications Unit (DAU). Notification (under Section 12(3) of the National Monuments Act), impact assessment and consultation with the National Monuments Service will be required.

In the event that flood risk management measures are required – including the possibility for increased flooding – in the vicinity of any recorded archaeological sites/monuments, it is recommended that appropriate mitigation measures be designed in consultation with the National Monuments Service and Donegal County Council Heritage Office.

There is also the potential for the presence of unrecorded archaeological sites and artefacts within the study area. Any lands that may be impacted by ground disturbance works required by the proposed scheme (e.g. hard defences, topsoil stripping, access tracks, compounds, site clearance works, trial-pits, etc.) may require archaeological investigations such as advance test trenching or monitoring of works. The appropriate mitigation measures will be determined during the design phase in consultation with the National Monuments Service.

All Record of Protected Structures sites have statutory protection and avoidance of these features is recommended. In the event that works are required that may have a negative impact on protected structures then prior consultation with Donegal County Council will be required.
Where works are required in the vicinity of recorded archaeological monuments and protected structures, the formulation of site-specific mitigation strategies is required. This will be carried out in consultation with the National Monuments Service and Donegal County Council. It is recommended that this takes place well in advance of designed construction works in order to allocate adequate time and resources to implement agreed mitigation measures.

Depending on the nature and extent of the works, the mitigation measures may take the form of design stage/pre-works assessment (including test trenching) and/or monitoring of construction works carried out during the scheme.

Where possible, areas that are the subject of local folklore should be avoided in order to preserve the cultural heritage of the region.

It is also recommended that consideration should be given to the potential for visual impacts on protected archaeological and architectural areas as part of the design of the proposed scheme.

### 4.7.3 Summary of key Constraints and Implication for the Proposed Scheme

- Given the provisions of the National Monuments Acts, no disturbance to, or interference with, any known archaeological sites can take place without prior Notification, assessment and consultation with the National Monuments Service of the Department of Housing, Local Government & Heritage (DoHLGH). This should be conducted through the established consultation process via the Development Applications Unit (DAU) as part of planning.
- Appendix F1 – F3 provides details on archaeological sites/monuments within the study area. Each site/monument is assigned a Zone of Archaeological Potential (ZAP) within which no works should be undertaken without concent of the Minister of Housing, Local Government & Heritage. These Zones are indicated in pink in the relevant figures within Appendix F.
- These sites include the Historic Town core of Lifford (RMP: DG071-008----) as well as numerous sites in the wider area dating from the prehistoric to post-industrial eras.
- The riverine environment of the River Finn at Lifford has high archaeological potential as attested by the discovery of several prehistoric log-boats over recent years. This area has also been a fording point on the River Finn/Foyle for millennia.
- The site of a battle between Jacobite and Williamite forces in 1689 is recorded in the vicinity of the present-day bridge between Lifford and Strabane. There is high potential for previously unrecorded underwater and terrestrial archaeology at this location.
- Additionally, there are 10 Protected Structures and 45 buildings, structures or features listed in the National Inventory of Architectural Heritage (NIAH) within the study area. These include the Old Courthouse and Gaol complex in Lifford Town (RPS: 40800806) which is rated as being of National Importance in the NIAH (Appendix F4-6).
- An Archaeological Impact Assessment should be carried out for the proposed scheme. This may include a programme of advance archaeological testing and/or monitoring of Site Investigations as required.
- An Architectural Heritage Impact Assessment should be carried out for the proposed scheme.
- All impacts on identified heritage – including areas to which local lore is connected – and their immediate environs, should be avoided where possible in the design of the proposed flood relief scheme.
- Where avoidance by design is not possible then archaeological investigations may be required for identified areas of archaeological potential which would be directly impacted by the proposed scheme.
- Advance investigations should be undertaken at design stage to facilitate mitigation design and allow adequate time to evaluate and record any archaeological features or deposits that may be encountered.

- Any ground disturbance works associated with the proposed scheme should be further assessed for archaeological potential. Appropriate mitigation should be determined during the design phase in consultation with the National Monuments Service (DoCHG).
- All Protected Structures have statutory protection and design avoidance of these features should be employed where possible.
- Donegal County Council Heritage and Conservation offices should be consulted at an early stage of project development.
- The National Monuments Service of the Department of Housing, Local Government & Heritage should be consulted at an early stage of the scheme development. This should include specific consultation with the Underwater Archaeology Unit (UAU) within NMS as there is high potential for encountering underwater archaeology during the project development.

## 4.8 LANDSCAPE AND VISUAL

This section of the Constraints Study Report addresses the landscape and visual constraints that have been identified within the study area. The study area is described with reference to Landscape Character and Landscape Type, and the ratings that have been assigned to it in terms of Value, Sensitivity and Importance. The relevant recommendations that have been set out for this area by Donegal County Council in terms of landscape and visual characteristics are also addressed.

### 4.8.1 Methodology

This section of the Constraints Study is based on a desk study of the previous landscape character assessments and reviews that have been carried out within the study area. It incorporates a description of the policies and objectives of Donegal County Council with regards to Landscape Character Assessment, Scenic Amenity, Views and Prospects, and Scenic Routes and Landscapes, with specific reference to the study area location. The primary sources of information consulted during the course of the desk study include:

- County Donegal Development Plan 2018-2024
- Environmental Protection Agency CORINE Land Cover Map
- Landscape Character Assessment of County Donegal
- Northern Ireland Regional Landscape Character Assessment
- National Landscape Strategy for Ireland (2015-2025)

### 4.8.2 Receiving Environment

#### 4.8.2.1 Landscape Character Assessment

Chapter 7 of the County Donegal Development Plan 2018-2024 sets out the policies and objectives of Donegal County Council with regards to Heritage and Environment. Section 7.1.1 refers to the Landscape Character Assessment of County Donegal, which was carried out in 2016 and identified Landscape 'Types' and 'Landscape Character Areas' (LCA). The report identified 23 different LCAs throughout the county. This assessment assigned three layers of value within the county, which are classified as areas of '*Especially High Scenic Amenity*'(EHSA), areas of '*High Scenic Amenity*'(HAS) and areas of '*Moderate Scenic Amenity*' (MSC). The County Donegal Development Plan provides a policy context to build on the evidential approach of the Landscape Character Assessment.

#### 4.8.2.2 Landscape Character and Type

The study area for this Constraints Study is located primarily within the Landscape Character Area: Foyle Valley (LCA No. 13), as identified in the Landscape Character Assessment of County Donegal. The Foyle Valley LCA forms part of the general Landscape Type: Undulating rural agricultural landscape with underlying schist geology in the north and Quartzite in the south. The Landscape Character Assessment describes Foyle Valley as follows:

*"Foyle Valley LCA is a broad river valley extending along the River Foyle from outside Lifford in the south of the area to the border with Northern Ireland on the outskirts of Derry City in the north of this LCA including the 'border villages' of Ballindrait, Carrigans, Lifford and St. Johnston. This LCA is characterised by undulating fertile agricultural*

*lands with a regular field pattern of medium to large geometric fields, bound by deciduous trees and hedgerow. There is a dispersed scatter of rural residential development within this LCA comprising of farmsteads and one-off rural dwellings along with areas of ribbon development along the county road network; there are a number of large detached historic houses and associated grounds within this landscape, particularly along the Foyle. This LCA has a strong visual connection to its mirror landscape on the opposite side of the River Foyle in Northern Ireland in terms of the similar landscape type and also that the Northern Ireland landscape inherently informs the views within and without of this LCA. The River Foyle is an ecologically, strategically and historically (including the fishing economy) important feature in this landscape."*

The LCA also lists the key characteristics of the Foyle Valley Type, including the following:

- *Interesting convergence of the rivers Finn, Mourne, Deele, Swilly Burn and Foyle in the east of this LCA that flow north as the River Foyle into Lough Foyle; mirrored on the east bank of the River Foyle that has formed a long flat island extending from Lifford north towards Porthall within the jurisdiction of Ireland.*
- *The landscape is physically shared with Northern Ireland to the east of this LCA; the River Foyle defines the border with Northern Ireland and the 2 jurisdictions share its catchment.*
- *Regular shaped medium to large, arable and pasture fields bound in hedgerow interspersed with deciduous trees and clumps of trees are characteristic to this 'plantation landscape'.*
- *The topography of this LCA lends a wide aspect over the surrounding landscape and of particular note are the many wind farms in Northern Ireland that are visually prominent within this landscape.*

#### 4.8.2.3 Study Area Land Cover

The CORINE land cover data for the study area was obtained from the Environmental Protection Agency (EPA). CORINE land cover is a map of the environmental landscape based on the interpretation of satellite images. It provides comparable digital maps of land cover for each country for much of Europe.

The CORINE data for the study area shows that there is a mixture of land cover within the study area which includes two areas of Discontinuous urban fabric (Lifford and Strabane towns), Pastoral land and areas of Complex cultivation patterns. Additionally, there is one area of Coniferous forests.

#### 4.8.2.4 Scenic Amenity, Views and Prospects

As outlined in Section 7.1.1 of the County Donegal Development Plan the plan has classified scenic amenities into three different layers of value. Areas of '*Especially High Scenic Amenity*'(EHSA), areas of '*High Scenic Amenity*'(HSA) and areas of '*Moderate Scenic Amenity*' (MSC):

'***Areas of Especially High Scenic Amenity (EHSA)*** *-Areas of EHSA are sublime natural landscapes of the highest quality that are synonymous with the identity of County Donegal. These areas have extremely limited capacity to assimilate additional development.*

***Areas of High Scenic Amenity (HSA)*** *-Areas of HSA are landscapes of significant aesthetic, cultural, heritage and environmental quality that are unique to their locality and are a fundamental element of the landscape and identity of County Donegal. These areas have the capacity to absorb sensitively located development of scale, design and use that will enable assimilation into the receiving landscape and which does not detract from the quality of the landscape, subject to compliance with all other objectives and policies of the plan.*

***Areas of Moderate Scenic Amenity (MSC)*** *-Areas of MSC are primarily landscapes outside Local Area Plan Boundaries and Settlement framework boundaries, that have a unique, rural and generally agricultural quality. These areas have the capacity to absorb additional development that is suitably located, sited and designed subject to compliance with all other objectives and policies of the plan.'*

It is the objective of Donegal County Council therefore to protect the visual and scenic amenities of the county's built and natural environment, as stated in Objective NH-0-5 and NH-0-7 of the Plan. Objective NH-0-5 relates to general views and prospects and states:

"*It is a general objective to protect, manage and conserve the character, quality and value of the landscape having regard to the proper planning and development of the area, including consideration of the scenic amenity designations of this plan, the preservation of views and prospects and the amenities of places and features of natural, cultural, social or historic interest.*"
Objective NH-0-7 relates to views on EHSA areas:
"*It is the general objective to protect the areas of EHSA from intrusive and/or unsympathetic developments.*"

#### 4.8.2.5 Scenic Landscapes

The County Donegal Development Plan's scenic amenity classifications (EHSA, HAS and MSC) identifies Scenic Landscapes, which in general make up the areas of natural beauty and important views and prospects most valued by residents and visitors to Donegal. These Scenic Landscapes act as indicators of high value landscapes and identify more visually sensitive locations where higher standards of design, siting and landscaping are required. The policies of the Council with regards to the Scenic Landscapes are as follows:

'***NH-P-6*** *It is a policy of the Council to protect areas identified as Especially High Scenic Amenity. Within these areas, only developments assessed to be of strategic importance or developments that are provided for by policy elsewhere in this Plan shall be considered.'*

'***NH-P-7*** *Within areas of 'High Scenic Amenity' (HSC) and 'Moderate Scenic Amenity' (MSC) it is the policy of the Council to facilitate development of a nature, location and scale that allows the development to integrate within and reflect the character and amenity designation of the landscape.'*

'***NH-P-13*** *It is a policy of the Council to protect, conserve and manage landscapes having regard to the nature of the proposed development and the degree to which it can be accommodated into the receiving landscape. In this regard the proposal must be considered in the context of the landscape classifications, and views and prospects contained within this Plan.'*

*'**NH-P-17** It is a policy of the Council to seek to preserve the views and prospects of special amenity value and interest, in particular, views between public roads and the sea, lakes and rivers. In this regard, development proposals situated on lands between the road and the sea, lakes or rivers shall be considered on the basis of the following criteria:*

- *Importance value of the view in question.*
- *Whether the integrity of the view has been affected to date by existing development.*
- *Whether the development would intrude significantly on the view.*
- *Whether the development would materially alter the view.'*

The study area lies within an area of Moderate Scenic Amenity (MSA) with an area of High Scenic Amenity (HAS) to the west of Lifford town. There are no areas of particular importance associated with protection of views within Lifford with the exception of:

- Views of the settlement skyline, particularly from strategic approaches to the town from either end.
- Views projecting out to the surrounding countryside provide a connection with the settlement and the landscape contributing to a strong sense of place.
- The layout of the town centre and views of the river

### 4.8.3 Summary of Key Constraints and Implications for the Proposed Scheme

It is an objective of Donegal County Council to ensure that landscape issues will be an important factor in all land-use proposals, thereby ensuring that a pro-active view of development is undertaken while maintaining respect for the environment and heritage generally in line with the principle of sustainability (County Donegal Development Plan). The relevant recommendations for the Landscape Character Area: Foyle Valley LCA No. 13, in which the study area is located and to which regard should be had in designing the proposed scheme, include:

- Conserve and enhance the characteristics in this Landscape Character Area that are important to tourism.
- Protect the existing character and setting of villages and village nuclei which are under pressure from population growth.
- Minimise disturbance of hedgerows in rural areas.
- Continue to promote agriculture as a major land use in this Landscape Character Type (LCT). This will help maintain the existing features of the landscape while also supporting the local economy and rural diversification.

In addition, key landscape constraints include;

- Views from residential and commercial properties and recreational views from riverside footpaths out to the Rivers Deele, Finn, Foyle and Mourne and their river banks should be retained in areas where flood protection measures are proposed.
- It is likely that in the current context, and in relation to the lower of three orders of landscape categorisation- Moderate Scenic Amenity (MSA)- to which the Lifford area is assigned, that the works that will be required to implement the Lifford FRS will not face major constraints with regard to short term effects on Landscape.

- The landscape and character of the town of Lifford are owing to historic narrow streetscapes and historic buildings of heritage value, such as the Courthouse and St. Lugacius Church buildings. These settings are characteristic and should not be adversely changed by the long-term effects or incongruous appearance or disproportionate size or form of new structures.
- The rivers, river corridors and riverine landscapes are accompanied by native woodlands and three species, historic woodlands, estates and houses along the Foyle, between and among which agricultural grasslands and cropped lands occur bounded by hedgerows and treelines. There are natural wetlands and wetland features such as wet grasslands, standing water and reeds, instream islands and sand or cobble banks. Near the river, many of these landscape features are derived from natural habitats. The management and replacement of these landscape features, as affected by the construction of the flood defence structures, will be led by nature conservation mitigation as well as purely visual objectives. There will be a strong emphasis on maintaining and enhancing wetland and riparian woodland features in the landscape.

## 4.9 AIR, NOISE AND CLIMATE

### 4.9.1 Air Quality

#### 4.9.1.1 Methodology

This section of the Constraints Study describes the existing air quality and noise environment within the study area and identifies possible issues which have the potential to constrain the design of any flood relief scheme.

The proposed flood relief scheme is located in an urban area and includes Lifford the county town of Donegal, to the east the study area also includes the town of Strabane, County Tyrone. The west of the study area is mainly made up of a rural area. For the purpose of this constraints study it is expected that the air quality in the existing environment is good due to lack of major sources of air pollution, such as heavy industry, in the immediate vicinity of the study area, issues may arise due to traffic and type of traffic volume. Due to the general character of the surrounding environment, air quality survey may be necessary due to volume of traffic.
The following items were the principal focus of the study:

- Identification of possible issues regarding air quality
- Identification of locations where there may be existing noise/ vibration-sensitive receptors
- Identification of any existing noise or vibration sources in the area
- A qualitative description of the existing noise climate

The following were referenced as part of the Constraints Study;

- County Donegal Development Plan (2018-2024)
- EPA website (www.epa.ie)
- Northern Ireland Department of Agriculture, Environment and Rural Affairs Air Quality reports.

#### 4.9.1.2 Air Quality Standards

In 1996, the Air Quality Framework Directive (96/62/EC) was published. This Directive was transposed into Irish law by the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999. The Directive was followed by four Daughter Directives, which set out limit values for specific pollutants:

- The first Daughter Directive (1999/30/EC) deals with sulphur dioxide, oxides of nitrogen, particulate matter and lead.
- The second Daughter Directive (2000/69/EC) addresses carbon monoxide and benzene. The first two Daughter Directives were transposed into Irish law by the Air Quality Standards Regulations 2002 (SI No. 271 of 2002).
- A third Daughter Directive, Council Directive (2002/3/EC) relating to ozone was published in 2002 and was transposed into Irish law by the Ozone in Ambient Air Regulations 2004 (SI No. 53 of 2004).
- The fourth Daughter Directive, published in 2007, deals with polyaromatic hydrocarbons (PAHs), arsenic, nickel, cadmium and mercury in ambient air.

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in 1997 and updated in 2007 and provides a strategy setting out air quality objectives and policy options to further improve air quality and encompasses the following objectives:

- Replacing the provisional 2010 PM10 objective in England, Wales and Northern Ireland with the exposure reduction approach.
- The introduction of a new ozone objective to protect ecosystems, in line with the EU target value set out in the Third Daughter Directive.

The Air Quality Framework Directive and the first three Daughter Directives have been replaced by the Clean Air for Europe (CAFE) Directive (Directive 2008/50/EC on ambient air quality), which encompasses the following elements:

- The merging of most of the existing legislation into a single Directive (except for the Fourth Daughter Directive) with no change to existing air quality objectives.
- New air quality objectives for PM2.5 (fine particles) including the limit value and exposure concentration reduction target.
- The possibility to discount natural sources of pollution when assessing compliance against limit values.
- The possibility for time extensions of three years (for particulate matter PM10) or up to five years (nitrogen dioxide, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

Limit values of the CAFÉ Directive as derived from the Air Quality Framework Daughter Directives are available in Appendix G.

#### 4.9.1.3 Air Quality Zones

The Environmental Protection Agency (EPA) has designated four Air Quality Zones for Ireland:

- Zone A: Dublin City and environs
- Zone B: Cork City and environs
- Zone C: 16 urban areas with population greater than 15,000
- Zone D: Remainder of the country.

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the Framework Directive and Daughter Directives. The site of the proposed development lies within Zone D, which represents rural areas located away from large population centres.

The ambient air quality monitoring carried out closest to the proposed development site in the Republic of Ireland is at the EPA offices in Letterkenny, Co. Donegal. This monitoring location lies within Zone C. However, Lifford would be considered Zone D.

Additionally, there is an ambient air quality monitoring station located within Strabane at Springhill Park (BT82 8BY). This site monitors Particles (PM10) and Sulphur Dioxide and the site aims to measure pollutants arising from domestic sources.

#### 4.9.1.4 Receiving Environment

The County Donegal Development Plan (2018-2024) includes the following objective with regard to Air Quality:

***'WES-0-6*** *It is the policy of the Council to provide for environmental protection, through: the protection of surface water and ground water from pollution in accordance with the River Basin Management Plan, Groundwater Protection Scheme and Source Protection Plans for public water supplies, the protection against soil contamination; minimising air and noise pollution; supporting remediation of all existing pollution; ensuring full compliance with relevant National and European Regulations, Statutes and Directives through monitoring and control of relevant activities.'*

An air quality monitoring station is already in place in Letterkenny and Strabane, so there are no immediate plans to monitor air quality in the vicinity of the study area. Given the size of the study area, it is not envisaged that a flood relief scheme will have a long-term detrimental effect on air quality.

Air quality may be temporarily impacted during the construction phase of the scheme, due in particular to the generation of dust.

The air quality in the vicinity of the proposed development site is typical of that of rural areas in the north of Ireland, i.e. Zone D.

PM10, ozone and nitrogen oxides are measured at the monitoring site in Letterkenny. The PM10 limit of 50 ug m-3 is deemed breached if more than 35 exceedances have occurred. This was exceeded 15 times during the measurement period. The Nitrogen dioxide hourly limit of 26 ug m-3 is deemed breached if more than 18 exceedances have occurred. The mean hourly $NO_2$ concentration was 13.1 ug m-3 which falls below the lower assessment threshold for the protection of human health.

PM10 and sulphur dioxide ($SO_2$) are measured at the monitoring site in Strabane. The PM10 limit of 50 ug m-3 has not been exceeded at this location. Sulphur dioxide ($SO_2$) has not been exceeded at this location.

Regarding the Letterkenny suburban background data, lower measurement values would be expected for the study area as it lies in a rural location, within Zone D while the Letterkenny monitoring station lies within Zone C.

### 4.9.2 Climate and Weather in the Existing Environment

County Donegal has a marine west coast climate, resulting in mild winters and moderate summer temperatures. The prevailing offshore winds bring moist air and frequent rain.

The Met Éireann weather and climate monitoring stations at Finner and Malin Head both located in County Donegal, are located approximately 77 Km and 84 Km from the study area respectively. Both of these stations are located a significant distance from the study area and both are located along coastline. Therefore, it is considered that this data cannot be used as it is not an accurate representation of the meteorological conditions within the study area.

The UK Met Office operates a weather station in Castlederg in Northern Ireland which records hourly rainfall data. This data was made available through the North-West Neagh Bann CFRAM Study. The station is located 15km South of Lifford. Meteorological data recorded at Castlederg is available from 1981-2010 and is shown in **Table 4.4**.

Mean annual temperature at the Castlederg station from 1981-2010 was 9.3° Celsius with the warmest month on average being July with a mean temperature of 15° Celsius for the 1981-2010 period. December was on average the coldest month with a mean temperature for this period of 5° Celsius. Average annual rainfall was 1143.7mm with the wettest month being January with a mean rainfall of 127.8mm. The driest month on average for the 1981-2010 period was May with a mean rainfall of 65.8mm. January was the windiest month during this 30-year period with a mean monthly speed of 8.5 knots.

**Table 4-4: Data from UK Met Office Weather Station, Castlederg, 1981 to 2010**

| Monthly and Annual Mean and Values | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** | **Year** |
| **TEMPERATURE (degrees Celsius)** | | | | | | | | | | | | | |
| Max. temp | 7.4 | 7.9 | 9.9 | 12.2 | 15.3 | 17.4 | 18.9 | 18.6 | 16.6 | 13.2 | 9.8 | 7.4 | 12.9 |
| Min. temp | 1.3 | 1.2 | 2.4 | 3.6 | 5.7 | 8.9 | 10.8 | 10.5 | 8.7 | 5.9 | 3.3 | 1.2 | 5.3 |
| Days of air frost (days) | 9.4 | 9.6 | 6.5 | 4.4 | 1.2 | 0.0 | 0.0 | 0.0 | 0.1 | 1.8 | 5.5 | 9.4 | 48.0 |
| **RAINFALL (mm)** | | | | | | | | | | | | | |
| Mean monthly total | 127.8 | 93.3 | 98.1 | 74.6 | 65.8 | 66.0 | 83.5 | 85.1 | 91.5 | 122.6 | 110.9 | 124.6 | 1143.7 |
| Days of rainfall >= 1mm (days) | 18.7 | 15.3 | 17.2 | 13.7 | 13.6 | 12.6 | 14.0 | 15.1 | 14.6 | 17.7 | 17.8 | 17.6 | 187.7 |
| **WIND (knots)** | | | | | | | | | | | | | |
| Mean monthly speed at 10m | 8.5 | 8.4 | 8.4 | 6.8 | 6.3 | 6.4 | 5.9 | 5.6 | 6.0 | 6.7 | 6.9 | 7.3 | 6.9 |

#### 4.9.2.1 Climate Change

It is widely predicted that the climate in Ireland will change in the future, leading to increases in sea level, storm event magnitude and frequency, and rainfall depths, intensities and patterns. These impacts, along with others due to land use changes such as urbanisation and deforestation, are likely to have significant detrimental implications for the degree of flood hazard, and hence flood risk, in Ireland. The degree of these impacts over time are, however, subject to significant uncertainty.

To provide an adequate understanding of the potential implications of the predicted impacts of climate change and other future changes, with due consideration of the significant uncertainty associated with such predictions, a minimum of two potential future scenarios should be assessed as part of the flood risk prediction. These two scenarios are referred to as the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS), as described below:

- The former (the MRFS) is intended to represent a 'likely' future scenario, based on the wide range of predictions available and with the allowances for increased flow, sea level rise, etc. within the bounds of widely accepted projections.
- The latter (the HEFS) is intended to represent a more extreme potential future scenario, but one that is nonetheless not significantly outside the range of accepted predictions available, and with the allowances for increased flow, sea level rise, etc. at the upper the bounds of widely accepted projections.

The allowances, in terms of numerical values for future changes to 2100 in relevant phenomena or characteristics, which should typically be used for each of these scenarios (**Table 4.5**).

**Table 4-5: Allowances for Future Scenarios (Time Horizon - 100 yrs.)**

| Measures | MRFS | HEFS |
|---|---|---|
| **Extreme Rainfall Depths** | + 20% | + 30% |
| **Flood Flows** | + 20% | + 30% |
| **Mean Sea Level Rise** | + 500 mm | + 1000 mm |
| **Land Movement** | - 0.5 mm / year[1] | - 0.5 mm / year[1] |
| **Urbanisation** | *No General Allowance – Review on Case-by-Case Basis* | *No General Allowance – Review on Case-by-Case Basis* |
| **Forestation** | - 1/6 $Tp^2$ | - 1/3 $Tp^2$<br>+ 10% SPR[3] |

*Note 1: Applicable to the southern part of the country only (Dublin – Galway and south of this)*
*Note 2: Reduce the time to peak (Tp) by a third: This allows for potential accelerated runoff that may arise as a result of drainage of afforested land*
*Note 3: Add 10% to the Standard Percentage Runoff (SPR) rate: This allows for increased runoff rates that may arise following felling of forestry.*

The following should however be noted:

- The allowances are based on current knowledge and science, and will be frequently reviewed and may be updated, as further research is undertaken
- The allowances are national, and some regionalisation or provision for the nature of the relevant catchment may be suitable where adequate knowledge or analysis would support

this (although this would need to be robustly justified where the allowances are less than the assumed national allowances)

#### 4.9.2.2 Noise & Vibration

It is not envisaged that the preferred flood relief scheme emerging from the Engineering Study will have a long-term detrimental effect on the noise environment within the study area; however, noise during the construction phase of the project may have a temporary adverse impact on the environment.

#### 4.9.2.3 Noise/Vibration-Sensitive Receptors within the Area

The majority of the noise/ vibration-sensitive receptors in the study area are concentrated in the town of Lifford, with an additional townland of Strabane across the river and sparse residential development also present throughout the remainder of the study area.

Vibration during construction has the potential to cause damage to structures, such as buildings, bridges and walls in the vicinity of the works.

### 4.9.3 Summary of key Constraints and Implication for the Proposed Scheme

- Prior to the selection of a preferred flood relief scheme as part of the Engineering Study, it is recommended that the short-listed flood alleviation measure be assessed in relation to the impact of noise and vibration during the construction phase of the project.
- It is recommended that mitigation measures be put in place to reduce the impacts on air quality and the noise environment during the construction phase of any proposed flood relief scheme.
- It is recommended that the effects of vibration during the construction phase be considered in the selection process for a potential flood alleviation measures.
- The scheme design should take into consideration any noise/vibration sensitive receptors such as residence, schools and retirement homes located in proximity to the flood relief scheme
- Meteorological and climatological data should be consulted in the engineering design process.
- The potential impacts of Climate change should be assessed with regard to the prediction of flood risk and should be taken into account in the design of a proposed flood relief scheme.

## 4.10 MATERIAL ASSETS

The Material Assets within the study area which are considered within this section of the Constraints Study include:

- Wastewater Infrastructure
- Waste Management Facilities
- Roads & Transportation Infrastructure
- Utilities

### 4.10.1 Methodology

The following sources were consulted in the assessment of material assets within the study area:

- EPA Waste Water Discharge Licence Applications database
- County Donegal Development Plan (2018 - 2024)
- Connacht- Ulster Region Waste Management Plan 2015-2021
- Waste Management Plan for Northern Ireland 2019

### 4.10.2 Receiving Environment

#### 4.10.2.1 Wastewater Infrastructure

Lifford town is serviced by an extensive sewer network that dates from the 1960's. This network was subsequently extended along the N15 (Straorlar Road) and along the N14 (Letterkenny Road). There are a number of private pump stations discharging to the network. There is one pump station and two storm water overflows on the network.

The Lifford Wastewater Treatment Plant (WWTP) is located on the bank of the River Foyle immediately east of the town, beside the former railway station and discharges to the tidal section of the River Foyle. The breakdown of waste water sources is approximately 74% domestic, 14% commercial, 10% institutional and 2% leisure/tourism. There are no identified sources of industrial waste water in the Lifford agglomeration.

The WWTP currently provides primary treatment for a Population Equivalent (PE) of 1,550 the current PE of the agglomeration is 1,969. This plant was commissioned in 1967 and has not received any major refurbishment since. Irish Water was granted planning permission (ref 20/51105) in October 2020 for a major upgrade of the WWTP and an NIS was prepared. The upgrades of this WWTP are being undertaken as part of the Shared Waters Enhancement & Loughs Legacy (SWELL) project. The aim of the SWELL project is to improve the water quality of Lough Foyle through better management of wastewater discharges. The site of the proposed WWTP upgrade co-incides closely with the potential Lifford FRS route and will represent an in-combination impact. Depending on timing and when the works will be carried out, the WWTP upgrade can be regarded as a potential significant constraint to the scheme.

#### 4.10.2.2 Waste Management

The Roughan historic Lifford town dump / landfill site which was the old town dump for Lifford, thought to date back to the 1960s or earlier has been identified at the Roughan. Its location is close to the current indicative scheme route just north of Lifford and may be viewed as a significant constraint to the scheme alignment and development, in view of potentially contaminated land and threat to water if disturbed, as well as potential instability and subsidence risks associated with the substratum.

The Connacht Ulster Regional Waste Management Plan (2015-2021) was consulted in relation to Waste Management Facilities in the vicinity of the study area. There is one licence application under review in the study area for a landfill site at Churchtown, Lifford. The application is currently awaiting a determination. The Donegal County Council holds Waste Licence ref.

W0062-1 for Churchtown Landfill Site, located >2km upstream of Lifford along the south bank situated in the lower alluvial flood plain of the River Finn. The site closed on 31st August 2000. The AER for the site indicates leachate to drain to the river and has ongoing effects.

#### 4.10.2.3 Roads & Transportation Infrastructure

The primary road access to the study area is via the N14, N15 in the Republic of Ireland and the A38 in Northern Ireland.

The County Donegal Development Plan outlines the proposed transport improvement projects across the county that are in addition to the continued upgrade and maintenance of the local county road network. This identifies the N15, N13 and N14 as critical Trans European Transport Network roads (TEN-T). As such the Development Plan lists the following policies and objectives for these important transportation infrastructures:

"***CS-O-9:*** *To coordinate and promote the delivery of key roads and access infrastructure (including the A5 Western Transport Corridor and A6 road projects, the Ten- T Network, Letterkenny Relief Road and the N14 Letterkenny/Lifford road) with the other relevant authorities including partners in the North West Strategic Growth Partnership and within the Northern and Western Regional Assembly so as to result in effective strategic connections to and through the County.*"

"***T-O-1:*** *To deliver the Trans European Transport Network (TEN-T), (as required by EU Regulation (EU) No. 315/2013 "Guidelines for the development of the Ten-T) as part of the core and comprehensive transport network of Ireland.*"

"***T-P-3****: It is a policy of the Council to work in partnership with the Northern Ireland authorities to strengthen and improve existing cross border transportation links (including walking and cycling routes) and support the development of new links (including walking and cycling routes) to enable the targeted spatial and economic development of the North West City Region.*"

In addition, the County Donegal Development Plan identifies that the border dimension has impacted upon and shaped the day-to-day social and economic activities in Donegal and the county has a total of 58 road crossing points to Northern Ireland. **Table 4.6** below identifies the total traffic movements between Strabane and Lifford recorded in 2015.

**Table 4-6: Traffic Movements between Lifford and Strabane**

| Route | Traffic Movement (per week) | Traffic Movement (per work day) |
|---|---|---|
| Strabane- Lifford | 120,569 | 17,224 |

*Source: 'Initial Analysis of the Challenges and Oppertunities of Brexit for the Derry City & Strabane and Donegal County Council Area- The North West City Region,' DCC & DCSDC, February, 2017)

#### 4.10.2.4 Utilities

Utilities in the study area include water supply networks, telecommunications, electricity supply and gas pipelines. It is highly likely that these services also cross the watercourses within the study area at various locations. These locations will need to be identified once the potentially viable flood risk management measures are identified.

### 4.10.3 Summary of Key Constraints and Implications for Proposed Scheme

- It is recommended that the existing and proposed location of overhead lines, watermains and underground services in the vicinity of any proposed flood relief scheme be ascertained as part of the Engineering Study. It is recommended that Donegal County Council and other utility providers with services in the area be consulted regarding the location and priority of existing and proposed services. It is further recommended that the services be protected as part of any proposed flood relief scheme.
- It is recommended that the Lifford Waste Water Treatment Plant is kept operational at all times, while having regard for the proposed upgrade of the plant. The upgrade of the Lifford WWTP (20/51105 planning reg ref, DCC) could be a significant constraint to the alignment of the Lifford FRS, depending on foot print and timing of the construction.
- It is recommended that Donegal County Council, National Roads Authority and Transport Infrastructure Ireland (TII) be consulted in relation to any effects on traffic management on the existing and proposed roads infrastructure in the study area from a proposed flood relief scheme.

# 5 PUBLIC CONSULTATION

The details and analysis of the first Public Consultation Day are contained within this section of the report.

## 5.1 PUBLIC CONSULTATION ARRANGEMENTS

### 5.1.1 Councillor Presentation

A presentation to the Elected Members from the Lifford-Stranorlar Municipal District of Donegal County Council (DCC) was held on Thursday the 27th of February 2020. The purpose of this was to present the study area to the elected members and to outline the process involved in the preparation for the Lifford Flood Relief Scheme. The presentation was held in Lifford Court House at 3.45pm. Following the presentation, members of staff from the Office of Public Works, DCC and Design and Environmental Team were available to answer questions from the members of the Council.

### 5.1.2 Public Consultation

The first Public Consultation event for the Lifford Flood Relief Scheme was held on the 27th of February 2020 between 4.00pm and 8.00pm in the Lifford Court House.

### 5.1.3 Advertising of Public Consultation

Advertising of the Public Consultation Event was undertaken with Highland Radio and on social media (Donegal County Council Twitter account, etc.) in the week preceding the event. In addition, notices were placed in the Donegal Democrat and the Strabane Chronicle in the week preceding the event. The event was also well publicised locally through distribution of flyers by post to those landowners and stakeholders affected by the proposed works.

### 5.1.4 Literature Available for the Consultation

Brochures and Questionnaires were available at the Public Consultation Day on the 27th of February. Information in addition to the questionnaires was also accepted on the evening of the event or subsequently by post.

## 5.2 PUBLIC CONSULTATION MATERIALS

### 5.2.1 Public Consultation Brochure

A Constraints Study Public Consultation brochure was produced for the scheme, which showed the study area under consideration and provided a brief explanation as to the process involved and the options being considered. Brochures were freely available to the members of the public and interested parties, both during and after the event. A copy of the brochure is attached in Appendix H.

### 5.2.2 Public Consultation Questionnaire

A questionnaire was provided by post to landowners and to each attendee (as required), in association with the brochure. This provided an opportunity for members of the public to express

their views on the study area shown and to provide information regarding flooding in their area, in addition to other comments they may have had relating to the design or Environmental Constraints within the study area. A copy of the blank questionnaire is attached in Appendix H.

### 5.2.3 Public Consultation Event Posters

The format of the Public Consultation event was based on a number of scheme posters. The posters included:

- Scheme Objectives and Overview
- Constraints Study
- Study Area Map
- Formal Public Exhibition Process
- FRMP/Flood Relief Scheme Process
- Public Involvement

## 5.3 PUBLIC CONSULTATION EVENT

### 5.3.1 Staffing of Event

At the venue, staff from Donegal County Council, OPW, Ryan Hanley Environmental Team and RPS Design Team were in attendance to show the study area, accept information from the general public and answer any questions at the preliminary stage.

### 5.3.2 Numbers of Public Attendees

Members of the public visiting the event were invited to sign a visitor's book to enable a record of the number of attendees to be maintained. A total of forty-three attendees signed the attendance book at the event in Lifford Court House.

## 5.4 PUBLIC CONSULTATION RESPONSE

### 5.4.1 Verbal Comments at Event

Visitors to the event are considered to have understood the proposals as presented at the event. Comments received generally related to the level of flooding in the past. Some members of the public demonstrated to project team staff the location of their property and their general concerns regarding the level of flooding and damage which arose from past flood events. In addition to provision of information about flooding, members of the public also provided their suggestions relating to potential flood alleviation measures. The majority of attendees were very supportive of a flood scheme, although frustrated at the projected time lines identified for a completed scheme. The recently 2015 event was fresh in the minds of many of the attendees and they were fearful of the recent weather conditions that occurred in 2020 around the time of the Event, which had resulted in high water levels and a perceived threat of flooding.

There was some discussion regarding environmental constraints with members of the public in particular the format of the EIA and the EIA process. How the project may impact or work with amenity in the general area was discussed in particular the proposed Riverine Park, as was wildlife, the use of the river by otters and fisheries and the presence of invasive plant species along the river bank.

The discussions and comments communicated on the day is further detailed in the questionnaire submissions.

### 5.4.2 Questionnaires Returned.

By the 16th of April 2020, a total of twenty-seven questionnaires and a hand written letter had been returned to the Team. No questionnaires were received after this date.

### 5.4.3 Other Consultation

A consultation was undertaken with the Riverine Project Team on the 20th of February 2020. Members of the Flood Relief Team met with three members of the Riverine project group.

## 5.5 ANALYSIS OF PUBLIC CONSULTATION RESPONSE

### 5.5.1 Analysis of Questionnaires

In total, there were twenty-eight respondents to the questionnaire, all of whom live or work within the study area. Twenty-four of which have been directly affected by past flooding events in Lifford. Full details of the responses to the questionnaires were provided to the Design Team. Outlined below is a summary of the information obtained from the questionnaires.

#### 5.5.1.1 Flooding Information

Of those who responded, most had residential property affected (46.1%), some had lands affected (23.1%) with the remaining respondents divided between those owning retail properties, public amenities and not being personally affected by flooding.

The majority of those who responded (34.6%) expressed the opinion that flooding occurred directly from the river while 11.5% of those who responded expressed the opinion that flooding occurred from surface water drains/ Sally Gardens Pumping Station. Additionally, 7.7% of respondents expressed the opinion that flooding occurred from over ground flows. Approximately 26.9% of all respondents expressed the opinion that flooding occurred from a number of sources, including directly from rivers/stream, from over ground flow and from drains, or various combinations of those listed.

Question 11 asked if respondents had put any measures in place to reduce the impact of flooding. 58% of those who responded had put some measures in place. The majority responded that they use sandbags. The remaining responses to this question stated that flood barriers, flood walls, non-return valves and drainage system maintenance were measures that people had introduced in their homes or workplaces as a result of the flooding.

#### 5.5.1.2 Flood Alleviation

When asked in Question 12 how the issue of flooding could be resolved in their opinion, of those who responded 54% of respondents expressed an opinion that additional flood measures including walls and raising local roads and improvements to/maintenance of the drainage network would help alleviate the flood risk. In addition, three of the respondents are of the opinion that upgrades of the pump at Sally Garden are required. Two respondents expressed the opinion that dredging of the River Deele and Finn would help resolve the flooding issue.

Three responses identified upstream of the proposed scheme as an area for further investigation and suggested that upgrades to the drainage system upstream of Lifford and attenuation/storage should be considered to help alleviate flooding. Some respondents expressed concern that the proposed measure would displace the water downstream and would result in additional flooding to their lands.

#### 5.5.1.3 Environmental Constraints

In Question 13 the respondents were given six environmental topics and asked to rank their opinion of the importance of each constraint, from very important to unimportant. Five respondents did not answer this question.

The majority of the respondents considered all six of the environmental topics presented as 'very important' with Biodiversity, Flora and Fauna considered the most important of the constraints with 66.7% of respondents indicating it as 'very important'. Water Quality was considered the second most important constraint with 61.9% of respondents indicating it as 'very important'. While Architectural & Cultural Heritage and Angling, Tourism & Recreation come in as joint third with 57.1% of respondents reporting these two constraints as 'very important'. Overall answers to this question are summarised in **Table 4.1** below:

**Table 5-1: Answers to Question 13 – In your opinion, how important are the following environmental constraints to the proposed Flood Relief Scheme.**

| Environmental topics | Very Important | Important | Moderately Important | Of Little Importance | Unimportance |
|---|---|---|---|---|---|
| **Biodiversity, Flora & Fauna** | **66.7%** | 0% | 14.3% | 14.3% | 4.8% |
| **Land use and Agriculture** | **42.9%** | 19.05% | 9.5% | 19.05% | 9.5% |
| **Water Quality** | **61.9%** | 14.3% | 4.8% | 9.5% | 9.5% |
| **Architectural and Cultural Heritage** | **57.1%** | 9.5% | 0% | 23.8% | 9.5% |
| **Landscape and Visual Amenity** | **52.4%** | 19.05% | 4.8% | 14.3% | 9.5% |
| **Angling, Tourism & Recreation** | **57.1%** | 14.3% | 0% | 19.05% | 9.5% |

#### 5.5.1.4 Further Comments

In addition, respondents were also given the opportunity to provide comments specific to the proposed scheme or the constraints. Six of the respondence left this section of the questionnaire blank. A summary of the responses received is provided in **Table 5.2** below:

**Table 5-2:Summary of Questionnaire responses received**

| Respondent No. | Comment |
|---|---|
| No.1 | The respondent does not want a smooth finish cement wall and suggests that existing stone is reused. Would not like a high wall. |
| No.2 | Access to the river needs to be maintained and improved.<br>Flood banks need to be maintained and should be used as linear walks<br>Giant Hogweed in the area needs to be managed<br>Have standby pumps available to use in flood areas |

| | |
|---|---|
| No.3 | Drainage is main concern. Asks if bank flooding is really the issue and noted that the Lifford-Rossger road job helped |
| No.4 | Water runs down the by-pass to the roundabout at hospital. Identifies biodiversity as important but not in the context of losing home |
| No.5 | The basement of their restaurant has flooded 16 times in the past 45 years. Acknowledges that the pump upgrades in Sally Gardens has helped but needs an additional pump. |
| No.6 | Expressed concern that their house is right at the line of the preferred route and would like to be consulted about the build |
| No.7 | Believes the proposed measures do not go far enough and could displace water to other lands with development potential within the town limits |
| No.8 | Hopes to develop their yard and would like to improve their view of the river so would like to see glass walls |
| No.9 | Expressed concern that the wall around Daly's will increase risk to their home as water has reached their rear fence in the past |
| No.10 | Would like to know how this scheme is going to be funded, when is it going to happen and how it can be assured that this scheme will be environmentally friendly and pose no risk to the local livestock in and around the river |
| No.11 | Expressed concern that access for fishing is maintained along the walkway from Lifford bridge to Green bridge |
| No.12 | States that there is too much fast flow discharging to the lower ground. Thinks that controlled discharge of the storm water has to be a benefit. Landscape developments need to be given more thought in relation to rapid discharge. |
| No.13 | Expressed the opinion that dredging/ cleaning of the River Deele is needed as at the meeting point of the Deele and Foyle a large sandbed has developed which obstructs the flow of the channel adding to the flooding in Lifford. |
| No.14 | Expressed the opinion that a concrete wall would increase the volume of water flooding lifford town itself as well as the proposed Riverene Project site. They also state that a concrete wall would be an eyesore and prevent walkers from viewing the three rivers joining point. |
| No.15 | Would like to see the scheme delivered as soon as possible |
| No.16 | States that the Lifford Strabane AC club have plans to use the land east of the track for club activities including the development of an indoor sports hall and want the proposed scheme to go around this as the current alignment severs Lifford AC land parcel. |
| No.17 | Would like the scheme to look at dredging silt deposits as they believe earth embankments take up too much room |
| No.18 | Expressed concerns about impacts on tourism of the scheme as they own a B&B in the area and the potential impact on fishing in the area |
| No.19 | Their primary concern is the surface water flooding |
| No.20 | Would like to note the effect that continued flooding has on people's mental health and would like for scheme to happen as soon as possible |
| No.21 | Would like to see the roads raised |

Although the proposal was generally considered good as a long-term approach to flood alleviation during the public consultation event most attendees expressed the opinion that more immediate short-term measures are required.

## 5.6 THE RIVERINE PROJECT RESPONSE

There is a proposal to develop a cross border Riverine Park between the towns of Lifford and Strabane. The proposed development will comprise of 30 acres of new community infrastructure, including a partially covered outdoor public event space, community building and playgrounds, as well as a pedestrian bridge, parkland walkways, river access and parking.

The proposed site of the park on the Lifford side is located immediately downstream of the urban extent. It is also on the downstream side of the preferred option developed during CFRAM.

A meeting was held between the Lifford FRS Steering Group and the DCC Riverine Project Team on the 20th of February 2020. The Riverine Project team indicated that the lands for the proposed park development are currently a floodplain of the Foyle River and they requested that the Lifford FRS incorporate the protection of the park for its future development. The current preferred option developed by the CFRAM study excludes this area from protection and the Riverine Project Team proposed an amendment to the line of the proposed CFRAM direct defence in order to reduce the flooding in the park They proposed that the hard defence line is moved to tie in with the existing embankment to the east, adjacent to the river, if it provides the required standard of protection. It was requested that RPS should assess the impact of the proposed alternative route of the hard defence on peak water levels during flood events, using the existing CFRAM hydraulic model.

## 5.7 CONCLUSION

The Public Consultation was held to inform the general public of the Constraints Study and preliminary aspects of the Lifford Flood Relief Scheme and to obtain information about flooding or other relevant environmental information about the study area presented. Interested persons were able to scrutinise the consultation materials, have relevant questions answered and take away a brochure setting out the project for future reference.

Overall, the Public Consultation Event was considered successful in reaching the target audience in Lifford who have been affected by flooding and any potential scheme design. The success of this can be attributed to a targeted postal campaign, specifically addressed to the relevant persons.

Overall feedback from members of the public was that they were happy to have been involved in the Public and Landowner Consultations; they felt like their views were being heard but wanted to see action arise out of the information as soon as possible.

# 6 REFERENCES

EPA. 2018. Foyle Catchment Assessment 2010-2015 (HA 01). Catchment Science & Management Unit Environmental Protection Agency September 2018 (Version no. 3)

County Donegal Development Plan 2018-2024

River Basin Management Plan for Ireland 2018 – 2021. Dept Housing, Planning and Local Government.

Lack, P. 1986. The Atlas of Wintering Birds in Britain and Ireland. Calton, Poyser

Niven A & Clarkin E. August 2018. Foyle Area and Tributaries Catchment Status Report 2017. Conservation and assessment of fish populations and aquatic habitats. The Lough's Agency.

NPWS (2017) Conservation Objectives: River Finn SAC 002301. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993) The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991. T. & A.D. Poyser

Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Reid, N., Dingerkus, K., Montgomery, W.I., Marnell, F., Jeffrey, R., Lynn, D., Kingston, N. & McDonald, R.A. (2007) Status of hares in Ireland. Irish Wildlife Manuals, No. 30. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Roller J. 2008. Otter *Lutra lutra* (1355) Conservation Status Assessment Report (unpubl NPWS)

Sharrock, J.T.R. 1976. The New Atlas of Breeding Birds in Britain and Ireland: 1968-72 (BTO). T and A D Poyser

Preston C. D., Pearman D.A., Dines, T.D. (Eds). 2002. New Atlas of the British and Irish Flora : An Atlas of the Vascular Plants of Britain, Ireland, The Isle of Man and the Channel Islands

# Appendix A
# Letter issued to consultees and copies of Consultee Responses

A1: Consultation Letter
A2: Brochure Accompanying Consultation Letter
A3: Responses from Consultees

# Appendix B
# Maps for Lifford

B1: Map of Zoning Areas Lifford
B2: Map of Zoning Areas Strabane

# Appendix C
# Ecology

C1: Bird Atlas Data within the Study Area
C2: Records of Protected Species in the Study Area
C3: Invasive Species Records Within the Study Area
C4: Loughs Agency Meeting Minutes

# Appendix D
# Aquifers and Water Abstractions

D1: Existing groundwater abstractions within Lifford
D2: Existing groundwater abstraction within Strabane
D3: Historic Wells within the Study Area
D4: Surface Water Data of the Study Area
D5: Aquifers in Study Area

# Appendix E
# Soils & Geology

## E1: Bedrock Geology in Study Area
## E2: Subsoils in Study Area

# Appendix F
# Archaeology

F1: Overview of Archaeological Sites & Monuments within the Study Area
F2: Overview of Lifford Town Historic Core
F3: Archaeological Inventory- RMPs and SMRs Study Area
F4: Aerial Overview of Built Heritage in Lifford Town
F5: Aerial Overview of Built Heritage within the Study Area
F6: Protected Structures/NIAH Listed Built Heritage within the Study Area

# Appendix G
# Air, Noise and Climate

## G1: Air Quality Standards

# Appendix H
# Public Consultation

H1: Brochure
H2: Questionnaire
H3: (1-6) Posters