THE NATIONAL PRELIMINARY FLOOD RISK ASSESSMENT (PFRA)

OVERVIEW REPORT

MARCH 2012

2019/RP/001/D

FLOOD RELIEF & RISK MANAGEMENT DIVISION
ENGINEERING SERVICES
OFFICE OF PUBLIC WORKS

ACKNOWLEDGEMENTS

The Office of Public Works (OPW) would like to acknowledge and thank all those who have contributed towards the preparation of the Preliminary Flood Risk Assessment (PFRA), including:

- Bord Gáis
- Dept. of Agriculture, Fisheries and Food
- Dept. of Environment, Community and Local Government
    - *National Monuments*
    - *National Parks and Wildlife Service*
- Eircom
- Environmental Protection Agency
- ESB
- Geological Survey of Ireland
- Health Service Executive
- National Roads Authority
- Waterways Ireland

The OPW also acknowledges those who have undertaken, or assisted with, the technical assessments that have provided information to enable the PFRA to be undertaken, namely Bird Watch Ireland, Compass Informatics, HR Wallingford and RPS.

The OPW would in particular like to thank consultants Mott MacDonald who have worked closely with the OPW in the development and implementation of the PFRA, as well as undertaking many of the technical assessments.

CONTENTS

GLOSSARY

APPENDICES

(Blank Page)

GLOSSARY

TERMS USED

Area for Further Assessment (AFA)	Areas where, based on the Preliminary Flood Risk Assessment, the risks associated with flooding are potentially significant, and where further, more detailed assessment is required to determine the degree of flood risk, and develop measures to manage and reduce the flood risk.
Communities	Cities, towns, villages or townlands where there are a collection of homes, businesses and other properties
Consequences	The impacts of flooding, which may be physical (e.g., damage to a property or monument) or a disruption (e.g., loss of electricity supply or blockage of a road).
Flood Extent	The extent of land that has been, or might be, flooded. Flood extent is often represented on a flood map.
Hazard	Something that can cause harm or detrimental consequences. In this report, the hazard referred to is flooding.
Indicative	This term is typically used to refer to the flood maps developed under the Preliminary Flood Risk Assessment. The maps are developed using simple methods, and generally national datasets, and are hence approximate, and not highly detailed, with some local anomalies.
Point Receptor	Something that might suffer hamr or damage as a result of flood, that is at a particular location that does not cover a large area, such as a house, office, monument, hospital, etc.
Receptor	Something that might suffer harm or damage as a result of a flood, such as a house, office, monument, hospital, agricultural land or environmentally designated sites.
Risk	The combination of the probability of flooding, and the consequences of a flood.

Significant Risk	Flood risk that is of particular concern nationally. There is not a prescriptive definition of 'significant' flood risk based on black-and-white rules. Section 6.1.1. of the report sets out guiding principles in defining areas that might potentially be at 'significant' risk.
Vulnerability	The potential degree of damage to a receptor (see above), and the degree of consequences that would arise from such damage.

ACRONYMS

AFA	Area for Further Assessment (see above)
CFRAM	Catchment Flood Risk Assessment and Management – The 'CFRAM' Studies will develop more detailed flood mapping and measures to manage and reduce the flood risk for the AFAs – See Section 1.1.2
DTM	Digital Terrain Model – A computer-based digital representation of the land surface (location and elevation)
GIS	Geographical Information System – A computer-based method for analysing geographical information and preparing maps
PFRA	Preliminary Flood Risk Assessment – See Section 1

1. INTRODUCTION

The Preliminary Flood Risk Assessment (PFRA) is a national screening exercise, based on available and readily-derivable information, to identify areas where there may be a significant risk associated with flooding.

The purpose of this report is to present an overview of the national PFRA; the draft outcomes of which were issued for public consultation in August 2011. The PFRA was finalised in December 2011, following review of all submissions made during the public consultation and any further information arising.

1.1. PRELIMINARY FLOOD RISK ASSESSMENT (PFRA)

The objective of the PFRA is to identify areas where the risks associated with flooding might be significant. These areas (referred to as Areas for Further Assessment, or 'AFAs') are where more detailed assessment will then be undertaken to more accurately assess the extent and degree of flood risk, and, where the risk is significant, to develop where possible measures to manage and reduce the risk. The more detailed assessment, that will focus on the AFAs, will be undertaken through Catchment Flood Risk Assessment and Management ('CFRAM') Studies (see Section 1.1.2).

The 'Floods' Directive (see Section 1.1.1) does not provide a definition for 'significant' flood risk. A highly prescriptive definition is not suitable given the preliminary nature of the PFRA, but guiding principles are set out in Section 6. It should however be remembered that, while flooding of one home will be traumatic to the owner or residents of that home, the PFRA needs to consider what is nationally or regionally significant flood risk.

The PFRA has been undertaken by:

- Reviewing records of floods that have happened in the past
- Undertaking analysis to determine which areas might flood in the future, and what the impacts might be, and,
- Consulting with the Local Authorities and other Government departments and agencies

This assessment has considered all types of flooding, including natural sources, such as that which can occur from rivers, the sea and estuaries, heavy rain and groundwater, and the failure of built infrastructure. It has also considered the impacts flooding can have on people, property, businesses, the environment and cultural heritage.

1.1.1. The 'Floods' Directive

The PFRA is a requirement of the EU 'Floods' Directive[1]. The text of the Directive that sets out the requirements of the PFRA (Articles 4 and 5) is reproduced in Appendix A.

[1] Directive 2007/EC/60 of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks

The 'Floods' Directive was transposed into Irish law by Statutory Instrument (SI) No. 122 of 2010[2]. The SI sets out the responsibilities of the Office of Public Works (OPW – The designated 'Competent Authority' for the 'Floods' Directive) and other public bodies in the implementation of the Directive.

1.1.2. The CFRAM Studies

The National CFRAM Programme was initiated to implement some of the key recommendations of the Report of the Flood Policy Review Group[3]. In particular, it was developed to prepare flood maps and flood risk management plans, focusing on areas where the risk is understood to be most significant. These areas of focus (the AFAs) are being identified through the Preliminary Flood Risk Assessment (PFRA).

The CFRAM Studies were commissioned during 2011 and early 2012, and will produce detailed flood maps for the AFAs in 2013, in line with the EU 'Floods' Directive. The Studies will also produce Flood Risk Management Plans in 2015 that will set out a long-term strategy and defined and prioritised measures, to reduce and manage the flood risk.

1.2. PUBLIC CONSULTATION ON THE PFRA

The 'Floods' Directive requires Member States to publish the PFRA once completed. However, the OPW has also publicly consulted on a draft of the PFRA before it was finalised, published and reported to the European Commission.

This report sets out the approach, methodologies and outcomes of the PFRA and was issued for public consultation. Details of the outcome of the public consultation process are available from the Report on the Designation of Areas for Further Assessment, which is available on the National CFRAM Programme website. No changes to the PFRA process were deemed necessary as a result of the consultation process and submissions received.

The PFRA has however involved extensive work and it is not possible to provide all relevant information in one report. This report therefore provides only an overview of the PFRA.

More detailed information on a range of aspects of the PFRA is provided in a number of technical reports. These reports are listed in Appendix B, and are available from the National CFRAM Programme website, www.cfram.ie, along with PFRA maps that indicate:

- Indicative areas potentially prone to flooding from natural sources of floodwater based on the preliminary analysis (Section 4.2), and,
- Probable and possible Areas for Further Assessment (AFAs) (Section 6).

[2] Statutory Instrument No. 122 of 2010, European Communities (Assessment and Management of Flood Risks) Regulations 2010 (Prn. A10/0432)

[3] The Report of the Flood Policy Review Group, OPW, September 2004

2. PFRA PROCESS

The Preliminary Flood Risk Assessment (PFRA) is intended to identify communities (i.e., cities, towns, villages, townlands), facilities and sites (e.g., environmentally designated areas) around the country where the risk due to flooding might potentially be significant (i.e., the Areas for Further Assessment, or 'AFAs', see Section 6). The AFAs will then be subject to more detailed assessment to more accurately analyse the flood risk under the CFRAM or parallel Studies. Where this more detailed assessment confirms that there is indeed a significant risk of flooding, then measures to reduce and manage the risk will be investigated.

It is important to note that the PFRA is not a detailed assessment of flood risk. It is rather a broad-scale assessment, based on available or readily-derivable information, to identify where there is a genuine cause for concern that may require national intervention and assessment, rather than locally developed and implemented solutions.

2.1. OVERVIEW OF PFRA APPROACH

Three key approaches have been used in undertaking the PFRA to identify the AFAs. These are:

- Historic Analysis: The use of information on floods that have happened in the past (Section 3)
- Predictive Analysis: Assessment of areas that could be prone to flooding, as determined by predictive techniques such as modelling, analysis or other calculations, and of the potential damage that could be caused by such flooding (Section 4)
- Consultation: The use of local and expert knowledge of the Local Authorities and other Government departments and agencies to identify areas prone to flooding and the potential consequences that could arise (Section 5)

Other EU Member States have used similar approaches to undertaking the PFRA as that undertaken in Ireland.

The provisional identification of the AFAs has involved interpretation of information from all three of the above approaches. The final designation of the AFAs also took into account information and views provided through the public consultation and arising from on-site inspections that were undertaken in parallel with the consultation. A description of this process and its outcomes is provided in Section 6.

2.2. FLOOD RISK

Flood risk is a combination of the probability and degree of flooding (the 'hazard') and the damage caused by the flood (the 'consequences'). What constitutes hazard and consequences are described below.

2.3. FLOOD HAZARD – SOURCES OF FLOODING

Flood hazard can arise from a range of sources of flooding.

The 'Floods' Directive includes a definition of flooding in Article 2(1). This is an open definition, and as such the PFRA considers flood risk arising from any major source of flooding, including:

- Natural Sources:
    - Rivers (fluvial, including increased flow from snowmelt)
    - Sea (coastal and tidal)
    - Groundwater
    - Rainfall (pluvial)
    - Tsunami (due to earthquakes, seabed landslips)
- Infrastructural Sources:
    - Urban Storm-water Drainage Systems (due under capacity)
    - Reservoirs (due to breach of walls / embankments)
    - Water Supply Systems (due to burst water mains)
    - ESB Infrastructure (hydropower dams and embankments)
    - Waterways Ireland Infrastructure (embanked canals)

Floods from sewerage systems (i.e., foul sewers) have been excluded from the scope of the PFRA on the basis that:

- They are typically localised and hence would generally cause limited damage.
- They would typically arise from blockage or other unpredictable incidents, and so it cannot be readily projected where they would be likely to occur, and hence where significant flood risk due to this source might exist.

Floods could also arise from sources other than those listed above. However, these would typically include floods for which the adverse consequences would never be deemed to be 'Significant', or which could not reasonably be predicted to occur, at any given location, based on the combination of their probability and degree of consequence. As such, these types of floods are excluded from the scope of the PFRA. Examples of such floods might include:

- Minor floods (e.g., overflowing appliances, burst plumbing, surcharging of septic tanks, local blockage of culverts, pipes or gullies, etc.)
- 'Freak' occurrences (e.g., over-turned water tanker, tsunami generated from a meteor strike, etc.)

2.4. CONSEQUENCES OF FLOODING

The 'Floods' Directive [Article 2(2)] defines flood risk as including potential adverse consequences for human health, the environment, cultural heritage and economic activity. The ways in which each of these consequences have been considered are outlined in the following sections.

3. HISTORIC FLOOD RISK ASSESSMENT

3.1. INTRODUCTION

The 'Floods' Directive [Article 4(2)(b)&(c) – see Appendix A] requires an assessment of past floods as part of the PFRA. Areas that have flooded and suffered significant adverse consequences from flood events in the past may continue to be subject to significant flood risk. An assessment of historic flood events has therefore been undertaken to identify possible AFAs.

Detailed information on flood extents (i.e., the areas subject to flooding) is generally not available except for a very small number of floods. Some of the requirements of the PFRA, namely Article 2(b) (past flood extents and conveyance routes), therefore cannot be derived. However, the predictive assessment undertaken (see Section 4) overcomes this deficit as it provides more comprehensive and useful information on flood extents than could be produced from past floods.

Descriptions of the reported past floods are provided via the national flood hazard mapping website (www.floodmaps.ie), as described below.

This section outlines the approach taken for the flood risk assessment based on historical flood data, which includes;

- For natural sources of flooding:
    - An assessment of where floods have happened in the past (Section 3.3.2)
    - An assessment of the damage caused by past floods (Section 3.3.3)
- The assessment of floods that have happened in the past arising from infrastructure failure (Section 3.4)

How the outcomes of these assessments were used in designating AFAs is outlined in Section 3.5.

3.2. AVAILABLE HISTORIC FLOOD INFORMATION

In 2006 the OPW launched the national flood hazard mapping website. This website displays the locations, and where available the extents, of flood events that have happened in the past and makes available a range of supplementary information, such as photographs, reports and newspaper articles, related to those past events.

The information provided through the website is that which was held and made available by the OPW, Local Authorities and a range of other Government Departments and agencies during the national data collection and verification project to develop the national flood mapping website, or which has been captured and entered for floods that have happened since the launch of the website. The database underlying the national flood mapping website contains information on over 5,000 past flood events throughout the country.

The majority of the information provided through the website relates to floods from natural sources of flooding (see Section 2.3), although there are no records on tsunami floods given the absence of any recent events (see Section 3.3.2.2). Information on a limited number of past flood events from infrastructural sources are provided, but it was considered that these records should be supplemented by additional data collection under the PFRA process through the relevant authorities (see Section 3.4).

To further supplement the above information, the knowledge of OPW staff on past floods and areas prone to flooding was also captured.

3.3. NATURAL SOURCES OF FLOOD RISK

3.3.1. Defining Spatial Areas for Analysis

To undertake the analysis, it was necessary to define certain spatial areas (e.g., town boundaries or townlands) within which the information on past floods could be assessed. The boundaries that were utilised in the historical analysis came from a number of sources. These were:

- Town boundaries published on the Central Statistics Office website
- Townland boundaries
- Defined areas around other locations (e.g., villages or other small communities) where flood risk had previously been identified

3.3.2. Historic Hazard

3.3.2.1. Flood Hazard Mapping Database

For the significant majority of records of past floods in the database that supports the flood hazard mapping website, no information was available on the impacts of the floods and the damages caused. However, it was considered important that other sources of information should also be considered in the analysis of historical flood events. In the absence of damage information, the location and number of floods can indicate the degree of flood hazard in a given location. Where this indication of hazard is coincident with areas that could potentially suffer damage in the event of a flood (e.g., a village or town), then such an area might be subject to flood risk, with higher numbers of past floods indicating a potentially greater degree of flood risk.

Towns, Townlands and other spatial areas (see Section 3.3.1) where records were available for past flood events were assigned a historic hazard category based on the criteria set out in Table 3.1.

The locations assigned a Historic Hazard Category of 2 or above are listed, with the recorded number of past floods and reported locations of recurring flooding, in Appendix C.1. The way this information was used in designating AFAs is set out in Section 3.5.

Table 3.1: Categorisation of Historic Hazard

Category	No. of Specific Past Floods (Dated / Undated)	No. of Locations of Reported Recurring Floods
4	10+	15+
3	5 – 9	10 – 14
2	2 – 4	5 – 9
1	1	1 – 4
0	0	0

3.3.2.2. Past Tsunami Floods

No records were found in the national flood mapping website database related to floods caused by tsunami.

Further investigation, with the assistance of the Geological Survey of Ireland, has revealed that some past tsunami, or tsunami-like, floods have occurred in Ireland. These include (pers comms, GSI):

- 1755 (1st November): An earthquake of approximate magnitude of 8.7M_w occurred approximately 200km south-west of Portugal. The earthquake and resulting tsunami devastated Lisbon in Portugal, and there are observations of the tsunami waves affecting the south and south-west coast of Ireland over a period of several hours.
- 1761: Resulting from an earthquake similar to the 1755 event, tsunami waves were observed in Kinsale (up to 2 feet high), in Carrick-on-Suir (4 foot rise in water level), Waterford, Dungarvan and New Ross
- 1854: Eye witness accounts of tsunami-like waves in Wexford, but no source has been identified for the event

Other earthquakes have since occurred in the same area as the 1755 event without observation of tsunami waves affecting Ireland. Other reports of large waves have also been recorded, but it is not clear that these are due to tsunami rather than other surge or meteorological causes.

3.3.3. Historic Risk

For a small minority of the past floods in the database of the flood hazard mapping website, information was available on the damage caused by the floods, i.e., financial damage or the number of properties flooded. This information was used in the PFRA as set out below.

3.3.3.1. Financial Damage

The financial damage information available for past floods was reviewed and validated. The locations and events for which valid (i.e., community-specific rather than regional) financial damage was made available are listed in Appendix C.2. The way this information was used in designating AFAs is set out in Section 3.5.

As the financial damage for all of the communities listed is substantial, all of the communities have been designated as probable or possible AFAs (see Section 6).

3.3.3.2. Properties Flooded

Towns, Townlands and other spatial areas (see Section 3.3.1) for which information was available on the number of properties flooded during a past event were assigned a historic risk category based on the criteria set out in Table 3.2.

Table 3.2: Categorisation of Historic Risk: No. of Properties Flooded

Category	No. of Properties Flooded
4	50+
3	10 – 49
2	1 – 9
1	0

The locations and events for which the number of properties flooded was available and provided to the OPW are listed in Appendix C.3. The way this information was used in designating AFAs is set out in Section 3.5.

3.4. INFRASTRUCTURAL SOURCES OF FLOOD RISK

The information in the flood hazard mapping database is generally limited to flooding from natural sources. Flooding can also arise from infrastructure failure. The historic flood risk assessment for this type of flooding is discussed below.

3.4.1. Local Authority Infrastructure

The Local Authorities are responsible for the following infrastructure that can give rise to flooding, and for undertaking the PFRA with respect to these sources:

- Urban Storm-Water Drainage System
- Reservoirs
- Water Supply Systems

It should be noted that foul sewerage systems are excluded from the scope of the PFRA (see Section 2.2), and that floods from combined sewerage systems are caused in the same way as storm-water drainage systems, and are hence included under that category.

The Local Authorities have reported during the PFRA preparation process further information (i.e. information not included in the database underlying the flood hazard mapping website) on notable past floods arising from infrastructural sources in the locations set out in Appendix C.4.

No past floods due to breach or failure of reservoirs embankments or walls have been reported by the Local Authorities.

3.4.2. ESB Infrastructure

The PFRA Report by the ESB[4] discusses past floods related to, or passing through, ESB infrastructure.

3.4.3. Waterways Ireland Infrastructure

The PFRA Report by Waterways Ireland[5] discusses past floods related to Waterways Ireland infrastructure.

3.5. USE OF HISTORIC HAZARD AND RISK OUTCOMES

Subject to the consideration of other information related to a given location, those communities assigned Category 4 for historic risk or hazard were designated as probable or possible AFAs. The other assigned categories of historic hazard or risk were taken into account along with all other sources of information in designating communities as AFAs or otherwise (see Section 6).

The outcomes of the PFRA, taking into account information on past floods from natural sources and infrastructure, is outlined in Section 6.3.

[4] Preliminary Flood Risk Assessment Report, ESB, 2011

[5] Preliminary Flood Risk Assessment, Waterways Ireland, 2011

(Blank Page)

4. PREDICTIVE ANALYSIS

4.1. INTRODUCTION

Historic flood event information is, by its nature, limited only to areas and location where past floods have happened and where information on those floods has been captured. An alternative method of assessing flood risk is by using what is called a 'predictive' approach, i.e., by examining the potential extent and resulting damages of floods that could happen in the future.

This involves the use of computational models, data on topography and analysis of flood flows and flood levels that could happen in the future to determine areas potentially prone to flooding (the 'hazard'), and an assessment of the damage that could arise in the event of flooding (the 'consequences'). The flood risk is a function, or combination, of the hazard and consequences.

The 'Floods' Directive [Article 4(d)] makes it optional as to whether or not Member States undertake a predictive assessment (i.e., an assessment of the potential consequences of future floods). The OPW has determined that it is appropriate for a predictive assessment to be undertaken for Ireland, given the lack of available information on past flood extents, and the broader need for flood maps with a national coverage.

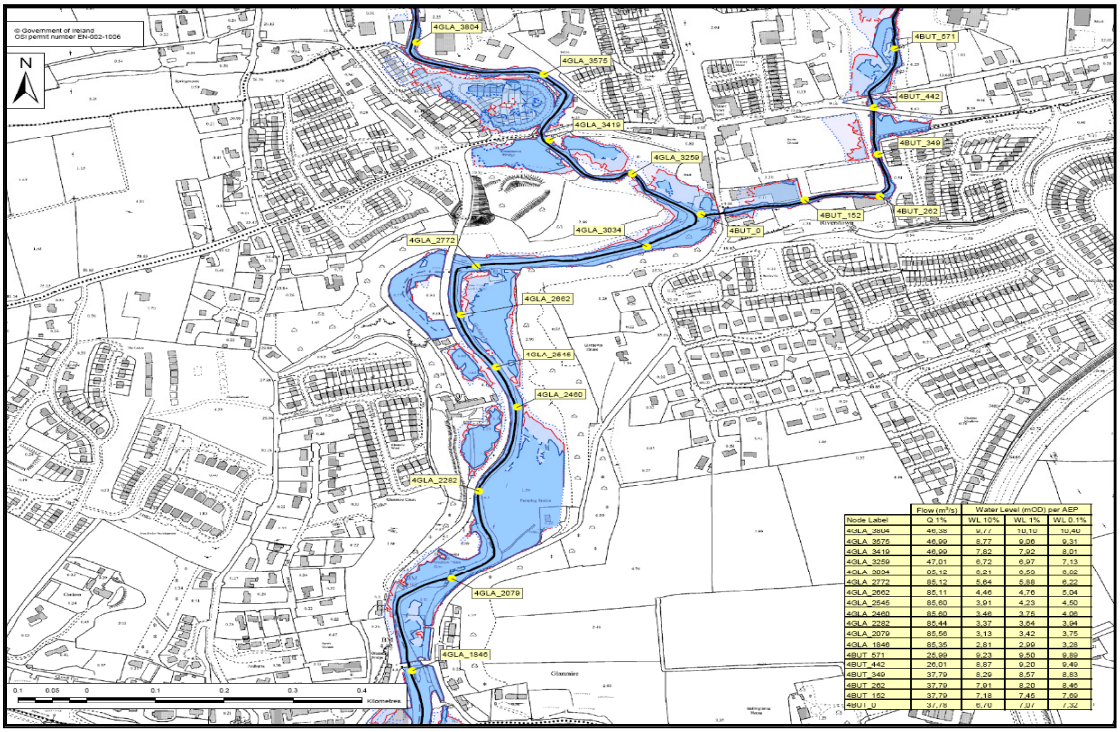
This section sets out how the predictive assessmen was undertaken, including the preparation of indicative flood maps, the assessment of potential damage that could arise if different types of 'assets' were to flood, and how the risk assessment was undertaken on the basis of this information.

4.2. INDICATIVE FLOOD MAPPING

As outlined above, flood risk is a combination of flood hazard and the potential consequences arising. A common and useful way for representing flood hazard is by way of flood maps that show the projected extents of flooding for a given likelihood, or probability, of flooding. An example of a flood map is shown in Figure 4.1, where the predicted flood extents are shown for three flood event probabilities, with different shades of blue indicating the areas projected to be prone to flooding for different probabilities or likelihood.

The likelihood of a flood is typically expressed as the percentage probability of a given severity of flood occurring or being exceeded at a given location in any given year. For example, a 1% annual exceedance probability (AEP) flood has a 1%, or 1 in a 100, chance of occurring or being exceed this year, or next year, or the following year, etc. The 1% flood is often referred to as the 100-year flood because, on average over a long period of time, it is likely to occur or be exceeded once every hundred years. However, it should be noted that this return period is a long-term average, and it is possible that the 1% (or 100-year) flood could happen twice in two years, and then possibly not for another 200 years.

Figure 4.1: Example of Flood Map



Flood maps can be developed in a range of ways, using different levels of analysis. Detailed flood maps, such as that shown in figure 4.1, are developed using hydraulic modelling, which is a complex and expensive process, and is the level of analysis that is being, or will be, undertaken for the AFAs during the CFRAM Studies. However, for the PFRA, which is a screening exercise based on available or readily-derivable information, a simpler and less expensive process was required to prepare the flood mapping information.

At the outset of the PFRA, flood maps with a national coverage were not available for any source of flooding. This section outlines the processes undertaken to prepare indicative flood maps for a range of flood sources, as set out in Section 2.3.

It should be stressed that the PFRA flood maps are *indicative*. They have been developed using simple and cost-effective methods that are suitable for the PFRA. They should not be used for local decision-making or any other purpose without verification and seeking the advice of a suitable professional.

4.2.1. Indicative Fluvial Flood Mapping

A project was commissioned, and undertaken by Compass Informatics, to prepare indicative fluvial flood maps suitable for the PFRA. A Technical Report[6] describes the process for the development of these maps in detail. Set out below is a summary description of the process and the mapping produced.

[6] Preliminary Flood Risk Assessment, Fluvial Flood Hazard Mapping – Normal Depth Mapping, Compass Information, 2011

To determine fluvial flood levels and then flood extents, using any level of hydraulic analysis, estimates of the flood flows are required. The OPW generated flood flow estimates for a range of flood event probabilities at major nodes every 500m, and upstream and downstream of confluences, on the entire river network in the country (based on the EPA 'blue-line' GIS data). These were generated using equations derived through the OPW Flood Studies Update research programme. A typical Irish river will carry what is called the 'mean annual flood' in-bank, with flows greater than this spilling out as flood water. The out-of-bank, or flood, flow was hence determined at the nodes by deducting the mean annual flood flow from the derived flood flow for the relevant flood event probability.

At each major node, and at intermediate nodes at 100m spacing, a floodplain cross-section was derived from the OPW's national Digital Terrain Model (DTM), which is a computer model of the topography of surface of the land. A hydraulic calculation, using Manning's equation, was then used to calculate a flood level for the given out-of-bank flood flow, based on the cross-section, slope and resistance to flow. This level was extrapolated across the cross-section derived as above to identify the outer extents of the flood on that cross-section. The outer extents of the flood were then joined up (linearly) to create a map of the projected flood extents. This process was undertaken, for the national river network for all nodes with a catchment area greater than 1 km^2, for three flood event probabilities (the 10%, 1% and 0.1% AEP events) to create the indicative national fluvial flood maps.

It should be noted that the maps have certain limitations and potential sources of local error, notably:

- Local errors in the DTM: For example, where bank-side vegetation was not filtered out of the DTM, the flood levels are likely to be over-estimated
- Local channel works: The method assumes a certain channel capacity, so the flood levels are likely to be over-estimated where works have been carried out to enhance channel capacity (e.g., where arterial drainage schemes have been completed)
- Flood defences: The method does not take account of flood defences
- Channel structures: The method does not take account of structures in or over the channel, and so where such structures exist and constrict flow capacity, the flood levels may be under-estimated

Further, Some buildings and other infrastructure may be shown as being within the flooded area, but may in reality be above the flood level.

The indicative national fluvial flood maps were included in the Draft PFRA Maps, provided in a separate volume, for the purposes of consultation on the PFRA.

4.2.2. Indicative Seawater Flood Mapping

Consultants RPS, in conjunction with the OPW, undertook a project to develop maps indicating coastal and estuarine areas prone to flooding from the sea. The predicted flood extents which were produced under the Irish Coastal Protection Strategy Study (ICPSS)[7] are based on analysis and modelling. The project included:

- Analysis of historic recorded sea levels
- Numerical modelling and statistical analysis of combined tide levels and storm surges to estimate extreme water levels along the national coastline for defined probabilities
- Calculation of the extent of the predictive flooding, by comparing calculated extreme tide and surge waters levels along the coast with ground level based on a Digital Terrain Model (DTM).

The maps have been produced at a strategic level to provide an overview of coastal flood hazard and risk in Ireland. It should be noted that the maps have certain limitations and potential sources of local error, notably:

- The flood extents are determined by horizontal projection in-land of the extreme sea levels. This may over-estimate the extent of flooding in large, flat areas as the method does not account for the inland propagation and then recession of the flooding following the rise and fall of the water levels according to the tidal cycle
- Flood defences, structures in or around river channels and other minor or local features have not been included in the preparation of the maps
- The methods (and maps) do not take account of (or represent flooding from) wave action or overtopping

These indicative national coastal flood maps were included in the Draft PFRA Maps, provided in a separate volume, for the purposes of consultation on the PFRA.

4.2.3. Indicative Groundwater Flood Mapping

A project was commissioned, and undertaken by Mott MacDonald Ltd, to prepare indicative groundwater flood maps suitable for the PFRA. A Technical Report[8] describes the process for the development of these maps in detail. Set out below is a summary description of the process and the mapping produced.

The methodology used to map areas potentially prone to groundwater flooding was evidence-based and incorporates the experience of groundwater experts at the Geological Survey of Ireland, Trinity College Dublin, and the Environmental Protection Agency. The evidence indicates that the vast majority of extensive, recurring groundwater floods originate at turloughs, and so this was the focus of the groundwater mapping project.

---

[7] Irish Coastal Protection Strategy Study, Phase 2, 3a and 3b – South East, North East and South Coasts – Technical Reports, RPS Consultants, 2010 & 2011

[8] Preliminary Flood Risk Assessment, Groundwater Flooding, Mott Macdonald, 2010

It was determined during the early stages of the project that it would not be possible to develop model-based flood maps for groundwater emergence due to a lack of data, and so alternative methods were required. The mapping of potential groundwater extents from turloughs was hence developed using the following methods, in descending order of preference:

1) The use of existing mapping of past groundwater flood events (e.g., from 1994/95, and late 2009), developed from ground-based observation, aerial photography or satellite imagery and the maximum extents observed
2) The delineation of flood extents around turloughs based on an assumed height of flooding of 4m above the base elevation of the turlough (the median of observed ranges) using the OPW's national DTM, with manual adjustment to ensure pragmatic extents
3) The use of records of past groundwater flood events to validate or adjust the flood extents derived using the other approaches

It should be noted that due to the absence of a model-based approach, only one set of flood extents were generated, with no specific event probability (although where observed flood data was used, these are likely to represent quite extreme events).

The indicative national groundwater flood maps were included in the Draft PFRA Maps, provided in a separate volume, for the purposes of consultation on the PFRA.

4.2.4. Indicative Pluvial Flood Mapping

A project was commissioned, and undertaken by HR Wallingford Ltd, to prepare indicative pluvial flood maps suitable for the PFRA. A Technical Report[9] describes the process for the development of these maps in detail. Set out below is a summary description of the process and the mapping produced.

The process for developing the pluvial flood extent maps was based on 'dropping' various depths and intensities of rainfall over a range of durations, and modelling how that rainfall would flow over the land and, in particular, pond in low-lying areas.

The rainfall events (depth, duration and intensity) were derived from the rainfall analysis undertaken by Met Eireann on behalf of the OPW for the Flood Studies Update research programme.

The amount of rainfall that was absorbed by the ground or, in urban areas, drained by the urban storm-water drainage system, and hence deducted from the water that would flow overland and pond, was estimated using the Flood Studies Update methodologies and from analysis against mapped extents based on more detailed modelling (in Dublin) respectively.

[9] Flood Risk Assessment and Management Programme: National Pluvial Screening Project for Ireland – Rep EX6335/2.0, HR Wallingford, November 2010

The process produced maps of areas likely to flood from intense rainfall events for three flood event probabilities (3.33%, 1% and 0.1% AEP events).

The maps were adapted to show only the extents where the flood depths were greater than 200mm (on the basis that depths lower than this would not cause significant damage given door-step levels above ground level). A peculiarity of the method also led to the modelled runoff building up where the waters would, in reality, naturally drain through the river network or to the sea, and so indicated flooded areas that intersected the river network or the sea were removed.

The above process has led to the development of indicative national pluvial flood maps. However, it should be noted that the process has assumed a constant capacity of urban storm-water drainage systems, and, due to the scale of analysis, has not taken into account local drainage structures such as culverts through embankments or other local drainage that would not be resolved in the DTM at a national scale. The maps are being reviewed and validated by the Local Authorities to take account of these limitations, before the decision on designation of AFAs is finalised.

The indicative national pluvial flood maps were included in the Draft PFRA Maps, provided in a separate volume, for the purposes of consultation on the PFRA.

4.2.5. Tsunami Floods

A report[10], co-funded by the Geological Survey of Ireland, was prepared in 2006 assessing the hazard from tsunami for the UK and Irish coast. The work in preparing the report involved modelling various earthquake scenarios of the kind that generated the 1755 tsunami (see Section 3.3.2.2), and how the tsunami waves would propagate towards the Irish coast, and hence what the wave heights would be at the coast.

The report concludes that the 1755 event was an extreme event, with a recurrence period in the order of 1,000 – 10,000 years[11]. The model indicates that wave heights along the south coast of Ireland would be expected to be typically in the order of 1 – 2m, rising to 2.5 – 3.5m in some localised areas. These wave heights (when added to normal sea level, e.g., Mean High Water Neap or Spring tides) would result in a water level comparable to extreme sea levels that would be expected from surge events with a probability of 2% or 1% – 0.1% (depending on assumed tide and location).

Given the very low probability of such tsunami events as quoted above, it would appear that the flood levels due to tsunami would be less than those due to extreme sea levels of comparable probabilities.

[10] Tsunamis – Assessing the Hazard for the UK and Irish Coasts, HR Wallingford, British Geological Survey & Proudman Oceanographic Laboratory, June 2006

[11] Scholz et al., 1986. Scaling differences between large interplate and intraplate earthquake, Bull. Seis. Soc. Am., Vol 76, 65-70

The flood levels at the coastline are however not the only consideration in the hazard and risk that could be caused by tsunami. The dynamics of a tsunami could result in the flooding extending further inland than tide and surge flood events with similar levels. The models required to assess these dynamic effects are however at present not available for Ireland, and their development would be beyond the scope of the PFRA.

4.2.6. Infrastructural Sources of Flooding

4.2.6.1. Urban Storm-water Drainage Systems

The predictive mapping of flood extents due to under-capacity of urban storm-water drainage systems (including combined sewerage systems) can be based on the indicative pluvial flood mapping, subject to local verification of drainage not modelled as part of the national pluvial screening assessment.

Floods due to blockages of drainage systems are excluded from the scope of the PFRA, as set out in Section 2.3.

4.2.6.2. Reservoirs

It has not been possible to undertake predictive mapping of flooding due to breaches of reservoirs with any reliability in terms of extent or probability under the scope of the PFRA, as the relevant necessary information is not currently available or readily-derivable.

4.2.6.3. Water Supply Systems

It has not been possible to undertake predictive mapping of flooding due to burst water mains with any reliability in terms of extent or probability under the scope of the PFRA, as the relevant necessary information is not currently available or readily-derivable.

4.3. POTENTIAL CONSEQUENCES

The indicative flood maps show areas prone to flooding (the ‘hazard’). The other component of flood risk is the damage that can arise in the event of a flood (the ‘consequences’).

Flooding can cause damage to people, businesses, infrastructure and other human activities and interests, such as our cultural heritage, as well as to the environment. These different types of interests and assets (referred to as ‘receptors’) can suffer differing degrees of damage in the event of a flood, and with different consequences in terms of the impact or importance of the damage caused. The susceptibility of a receptor to damage, and the severity of the consequences of such damage, are described as the ‘vulnerability’ of the receptor. An analysis has been undertaken to assess the potential consequences of flooding to a wide range of different types of receptors, based on the likely degree of damage, and the importance of that damage.

The analysis takes into account the value or importance of the asset or service, the degree of damage or interruption to that asset or service, and the risk to life that could arise in the event of flooding.
The potential consequences have been categorised using one of five vulnerability categories, as set out below:

- Critical
- Extreme
- High
- Moderate
- Low

This analysis, which has been undertaken in consultation with relevant Government Departments and agencies, is detailed in the Technical Report on the Predictive Assessment of Potentially Significant Flood Risk[12].

The vulnerabilities assigned to the range of receptors, that are the outcomes of this process, are provided in Appendix D. The vulnerabilities assigned are relevant to all sources of flooding where indicative flood maps are available.

A specific assessment has been undertaken in relation to monuments, as little international research exists on this type of flood damage. This assessment and its outcomes (i.e., vulnerabilities of different monuments) are detailed in the Technical Report[13].

A specific assessment has also been undertaken in relation to the vulnerability of environmentally designated sites, as little international research exists on this type of flood damage. This assessment and its outcomes (i.e., vulnerabilities of different protected species and habitats) are detailed in the Technical Report[14].

4.4. INDICATIVE FLOOD RISK ANALYSIS

4.4.1. General Methodology

The indicative flood maps delineate the areas potentially prone to flooding, and the potential damage that could be caused by the flooding has been determined by an assessment of the vulnerability classification of receptors. These two components have been integrated to determine where the flood risk might potentially be significant.

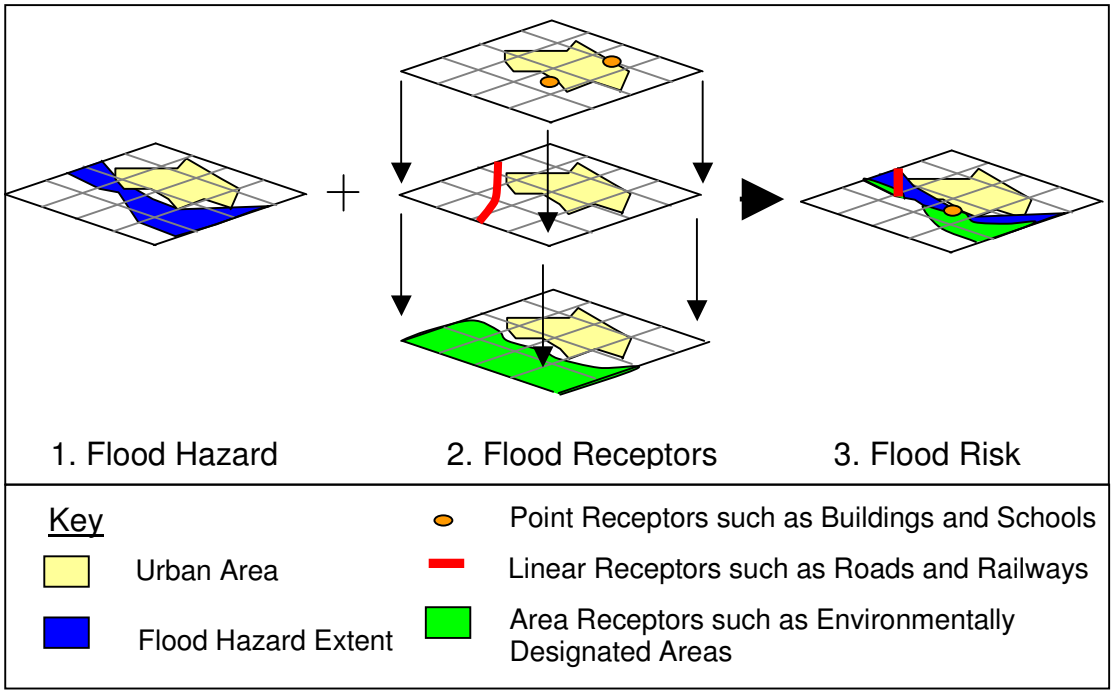
This has been achieved by the use of Geographical Information Systems (GIS) that allow different spatial data (i.e., the indicative flood maps and the receptors) to be overlain. This brings the two components of risk together, to allow the flood risk to be determined for specific areas, as indicated in Figure 4.2.

[12] Preliminary Flood Risk Assessment: The Predictive Assessment of Potentially Significant Flood Risk, Mott MacDonald, 2011

[13] Preliminary Flood Risk Assessment, Methodology for Classifying the Vulnerability of National Monuments from flooding in the Republic of Ireland, Mott MacDonald, 2011

[14] Preliminary Flood Risk Assessment, Flood Vulnerability Assessment of Natura 2000 Sites, Mott MacDonald, 2011

Figure 4.2: Integration of Hazard and Potential Consequences to Determine Risk



4.4.2. Describing Flood Risk

It is common practice to measure flood risk in economic terms (i.e., annual average damages and long-term damages measured in Euro). However, these assessments typically only evaluate flood risk to a limited range of assets, such as damage to the structure and contents of houses and other properties, for which measuring economic damages can be done readily, based on analysis of records of financial losses collected over a long period of time. These assessments do not measure the financial risk for other types of risk, such as that to people, the environment and cultural heritage, for which monetarising damages (i.e., converting into financial losses) is extremely difficult, and for which there is a relative deficit of research.

The flood risk has hence been measured in terms of the 'Flood Risk Index'. This is a metric that allows the risk to different types of asset (e.g., home, business, monument, utility asset, etc.) to be expressed numerically, but without attempting to assign monetary values to all types of damage. This allows risk to the different types of assets to be compared, and also for different mixes of risk to these different types of asset to be compared between different communities.

The Flood Risk Index is calculated based on the matrix set out in Table 4.1, integrating the probability of flooding and the vulnerability classification of the asset or activity potentially at risk. A more detailed description of the calculation of the Flood Risk Index is provided in the Technical Report (See Section 4.3, Footnote 12).

Table 4.1: Matrix for Determining the Flood Risk Index

Vulnerability Class	Vulnerability Class Factor	Probability of Flood Event (Annual Exceedance Probability)		
		10% - High	1% - Medium	0.1% - Low
Critical Vulnerability	2500	25000	2500	250
Extreme Vulnerability	250	2500	250	25
High Vulnerability	25	250	25	2.5
Moderate Vulnerability	2.5	25	2.5	0.25
Low Vulnerability	1	10	1	0.1

The Flood Risk Index has been calculated for each individual receptor (i.e., every house, non-residential property, monument, etc.). The Index has also been calculated for whole communities (cities, towns and villages), by adding together the Index values for each of the receptors within the community.

4.4.3. Flood Risk for Point Receptors

The receptors, locations and communities for which a Flood Risk Index of greater than 150 (greater than 50 for Groundwater flood risk, which can be of very long duration) has been determined are listed in Appendix E, categorised by indicative:

- Fluvial and Coastal flood risk (Appx E.1)
- Groundwater flood risk (Appx E.2)
- Pluvial flood risk (E.3).

4.4.4. Flood Risk to the Environment

Environmentally designated sites are spatially distributed receptors (rather than a discrete point or very small area). As such, only part of a designated site may be prone to flooding, rather than the receptor being either fully flooded or not flooded at all that is the case for point receptors. The specific location of the designated species within each of the sites is not known, and so it is not possible to state for any given site whether the relevant species or habitat are within the part of the site that is prone to flooding.

It is therefore not appropriate to assess the risk to environmentally designated sites in exactly the same manner as the point receptors. The initial risk analysis for the sites has been undertaken in broadly the same manner, calculating the initial Flood Risk Index on the basis of the derived vulnerabilities for a site (see Section 4.3) and the probability of flooding. The final Flood Risk Index for a site is however then factored by the proportion of that site prone to each probability of flooding, e.g., by 0.1 if only 10% of a site is prone to flooding for a given probability. This simple proportional factoring is required as the specific location of species within a site is generally not known.

The environmentally designated sites for which a Flood Risk Index of greater than 150 has been determined are listed in Appendix E.4.

4.4.5. Flood Risk to Agriculture

As for environmentally designated sites, agricultural land is spatially distributed, rather than a point receptor, and hence must be treated in a different manner.

The concept of amalgamating adjoining areas or grid squares of agricultural land prone to flooding to assess the flood risk for a cluster of land is not practical as most of the floodplain is used for agricultural purposes. As a result, any amalgamation of flooded agricultural land generally joins up all of the floodplain for a whole river system or length of coastline into one unit. Assessing risk under the PFRA on the basis of such a unit (i.e., the full river system or coastline floodplain) is not appropriate.

With the intention of identifying areas where there is particularly extensive agricultural land prone to flooding within a certain area, the risk was assessed on the basis of the area of agricultural land prone to flooding per unit length of river or coast-line, represented by hectares / kilometre reach.

Maps showing the outcomes of this analysis are provided in Appendix E.5.

4.4.6. Flood Risk to Roads and Rail

Roads and railways can be prone to flooding, interrupting the services these transports routes provide. The flooding, and resulting interruption, usually only lasts a few hours, although in some areas can last for days or even weeks. The flooding can, in severe events, also cause damage to the infrastructure.

The impacts of the interruptions, and susceptibility to damage, will vary locally. The impacts can extend to the isolation of properties and restriction of the movement of emergency service vehicles, such as ambulances or the delivery of emergency supplies.

The assessment of these local impacts and potential damages is beyond the scope of the PFRA. However, making use of the indicative flood maps produced through the PFRA, the impacts and potential damages can be examined locally. They can then be addressed through local measures and accounted for in flood event emergency response plans.

4.4.7. Infrastructural Sources of Flooding

4.4.7.1. Urban Storm-water Drainage Systems

As noted under Section 4.2.6.1, flood risk potentially arising due to under-capacity of urban storm-water drainage systems can be initially assessed based on the indicative pluvial flood mapping. These assessments are however indicative and represent only the *potential* risk due to this source, and should be validated by the Local Authorities in relation to any drainage not modelled as part of the national assessment, and through the public consultation process.

The locations and Flood Risk Index for areas potentially affected by this source of flooding, noting the above limitations, are set out in Appendix D.3.

4.4.7.2. Reservoirs

As it has not been possible to undertake predictive mapping of flooding due to breaches of reservoir embankment of walls with any reliability based on available or readily-derivable information, it has not been possible to undertake a predictive risk assessment following the methodology set out above.

4.4.7.3. Water Supply Systems

As it has not been possible to undertake predictive mapping of flooding due to burst water mains with any reliability based on available or readily-derivable information, it has not been possible to undertake a predictive risk assessment following the methodology set out above.

4.4.7.4. ESB Infrastructure

The PFRA Report by the ESB discusses potential future floods related to, or passing through, ESB infrastructure.

4.4.7.5. Waterways Ireland Infrastructure

The PFRA Report by Waterways Ireland discusses potential future floods related to Waterways Ireland infrastructure.

4.5. POTENTIAL IMPACTS OF CLIMATE CHANGE

International and national research indicates that flooding is likely to worsen as a result of climate change. Rainfall patterns are expected to change with wetter winters and drier summers. This could increase the severity of fluvial flooding, although this is dependent on the nature of the relevant catchment and the degree of change appears to vary regionally. Sea levels are already being observed to be rising, and it is anticipated that mean sea level will continue to rise for the foreseeable future.

The information required to undertake a predictive analysis of the potential flood risk impacts of climate change is not currently available, but is under development, and once available will be used to review the PFRA outcomes.

The CFRAM Studies will undertake detailed assessments of the potential impacts of climate change on the flood risk in the AFAs, with these potential impacts being taken into account in the development of appropriate flood risk management measures.

4.6. USE OF PREDICTIVE HAZARD AND RISK OUTCOMES

The outcomes of the PFRA, taking into account the predictive analysis, are outlined in Section 6.3.

5. CONSULTATIVE PROCESS

Consultation with various bodies has been undertaken during the preparation of the draft PFRA, which is now being published for formal, public consultation.

5.1. CONSULTATION TO DATE

The consultation to date includes two rounds of workshops (Summer 2010 and Winter 2010-2011) involving all Local Authorities. During these workshops, the Local Authorities provided information on areas known or suspected to be at risk from flooding, and reviewed provisional Areas for Further Assessment (AFAs) identified by the OPW in relation to fluvial and coastal flood risk. This information and review has fed into the identification of the probable and possible AFAs set out in Appendix E (see Section 6).

Consultation has also been held with the following organisations to inform the process and draft outcomes of the PFRA:

- Dept. of Agriculture, Fisheries and Food
- Dept. of Environment, Community and Local Government
    - *National Monuments*
    - *National Parks and Wildlife Service*
- Environmental Protection Agency
- ESB
- Geological Survey of Ireland
- Health Service Executive
- National Roads Authority
- Waterways Ireland

Discussions have also been held with utility operators in relation to the location and potential vulnerability of utility infrastructure.

5.2. PUBLIC CONSULTATION PROCESS

As stated in Section 1.1.5, Ireland went beyond the requirement of the 'Floods' Directive to simply publish the PFRA, and publicly consulted on a draft of the PFRA before it was finalised. Members of the public and all interested parties and stakeholders were encouraged to review the draft PFRA and provide further information on flooding and flood risk, and / or make and submit observations or submissions on the process followed and its outcomes

It should be noted that the consultation was undertaken in parallel with site-based validation of the outcomes, which were taken into consideration alongside the outcomes of the consultation process.

Details of the outcome of the public consultation process are available from the Report on the Designation of Areas for Further Assessment, which is available on the National CFRAM Programme website. No changes to the PFRA process were deemed necessary as a result of the consultation process and submissions received.

6. OUTCOMES

Section 3 has outlined the historic flood risk assessment, while Section 4 has described the predictive flood risk assessment, with both being informed by the consultation process, as set out in Section 5.

The purpose of the PFRA is to identify the Areas for Further Assessment (AFAs), as set out in Article 5(1) of the 'Floods' Directive.

As described in Section 2, the PFRA was undertaken based on the three approaches noted above. This required the consideration of the potential flood risk at each location where some flood risk has been identified through *any* of the three approaches, taking into account the information derived through *all* of the three approaches, to determine whether the flood risk might (subject to further assessment) be significant.

6.1. THE DESIGNATION OF AFAs

As set out in Article 5(1) of the 'Floods' Directive, Member States are required to define areas where potential significant flood risks exist or might be considered likely to occur.

It is not possible based on the PFRA (a *preliminary* assessment) to determine definitively where significant flood risks exist, but it is rather the objective to determine where, based on a preliminary assessment only, where it is considered that such risk might *potentially* exist. It is for these areas where the State will then invest resources, through the CFRAM Programme, to more accurately assess the risk, and then assess what measures might be appropriate to manage and reduce the risk.

This requires a definition as to what 'significant' risk is. Given the preliminary, and hence uncertain, nature of the PFRA, it would be inappropriate to define highly prescriptive, or 'black and white', rules for significance based on any one of the approaches taken. It is rather necessary to consider in combination the outcomes of all approaches.

6.1.1. Guiding Principles for Designation of AFAs

Notwithstanding the need to avoid prescriptive rules for the designation of AFAs, it is useful for consistency and transparency to set guiding principles for this consideration. Subject therefore to the presence or otherwise of supporting or contradictory information arising from one of the other approaches, areas have been designated as probable AFAs (see below) if:

- The historic flood risk assessment indicates that a location has a historic hazard or risk category of 4 (see Section 3)
- The predictive flood risk assessment indicates that a location has a community Flood Risk Index in excess of 250, or where an individual receptor has an Index in excess of 250 and is deemed to be of strategic, national importance or be critical in the event of a major regional emergency (such as a power station, international airport or hospital)

– Information has been provided through consultation that clearly indicates that an area is subject to severe flood risk that is beyond the capacity or responsibility of the Local Authority or other responsible body to manage locally.

It is reiterated that the above are not definitive rules, but rather principles. The potential designation of an area based on any one approach / principle is also being subject to evaluation through the other approaches for a given location, and if the other approaches support or contradict the potential designation.

6.1.2. Probable and Possible AFAs

The PFRA initially defined probable and possible AFAs. This reflects the preliminary nature of the PFRA, and the need to take into account the outcomes of the consultation. All of these provisional AFAs were also subject to validation during site-visits that are ongoing in parallel with the public consultation process. At the time of the consultation and validation processes, it was foreseen that:

– Probable AFAs were intended to be designated as AFAs, and hence subject to further assessment through the CFRAM Studies, unless information arose to indicate that this should not be the case

– Possible AFAs would not be designated as AFAs, unless information arose to indicate that this should not be the case. These were areas where the degree of risk, based on the PFRA work done to date, did not indicate that area should be designated as an AFA, but where there is some degree of risk and where sites visits and consultation were required to validate the risk

It is also important to note that if an area has not been designated as an AFA, then that area is not excluded from any further action to address flood risk, and works to reduce or manage the flood risk could still be considered through channels other than the CFRAM Programme.

6.2. NATURAL SOURCES OF FLOODING

The provisional AFAs, both probable and possible, related to flooding from rivers, sea-water and groundwater, based on consideration of the outcomes of all approaches, as set out in the Sections above, are listed in Appendix F.

6.2.1. Flood Risk to the Environment

While a number of environmentally designated sites have a Flood Risk Index score of greater than 250 (see Section 6.1.1), it is not necessarily appropriate to designate any or all of these areas as AFAs.

For example, some of the sites have been deemed to be at risk due to the effect that a flood event could have on an aquatic species. An example would be sites with Pearl Mussel, which would be vulnerable to high levels of siltation or scouring that could be caused by a flood. It would be neither possible nor appropriate to prevent flood events in the river itself, as to do so would require strict, artificial controls on the hydrological regime of a river, such as through the

construction of a dam and flooding of large areas. This in turn would be likely to cause significant detrimental effects elsewhere and / or be contrary to other environmental objectives (e.g., those of the Water Framework Directive).

Similarly, some of the sites may be vulnerable due to flood-sensitive habitats on the floodplain. Again, it may not be appropriate to prevent large reaches of a floodplain from flooding, other than in exceptional circumstances. To do so could cause significant detrimental effects for other species in the area, and / or be contrary to other environmental objectives (e.g., hydro-morphology under the Water Framework Directive). It may well also exacerbate flood risk elsewhere.

Finally, flooding is a natural process. Habitats and species will generally adapt to the prevelant hydrological regime as part of that natural process, and hence intervention may not be appropriate.

As such, it was deemed more appropriate to ensure that the environmental vulnerabilities and risk identified through the PFRA are taken fully into account during the consideration and development of flood risk management options (e.g., through the Strategic Environmental Assessment or Appropriate assessment under the Habitats Directive) under the CFRAM Programme. This would ensure that any flood risk management measures adopted take account of these risks, and do not exacerbate the risk to these sites or the vulnerable species therein.

6.2.2. Flood Risk to Agriculture

The PFRA has identified where there is a concentrated flood risk to agricultural land is concentrated (see Appendix E.5). The designation of AFAs for agricultural risk has been based on the areas where this concentration is greatest, taking into account relevant submissions made during the PFRA consultation process.

6.2.3. Flood Risk from Tsunamis

There is historical evidence of tsunami affecting the coast of Ireland, and predictive assessments have shown that tsunami waves caused by Atlantic seabed earthquakes could affect the Irish coast. However, the probability of tsunami affecting Ireland is very low, and the flood levels of these very rare floods would generally be less at the coast (or in some locations, about the same) than predictive coastal floods caused by more frequent surge events. The assessment of flood risk from surge-related coastal floods in coastal AFAs, and the consideration of measures to manage such floods, is therefore likely to also assess and address, to some degree if not completely, the potential effects of tsunami. AFAs were therefore not specifically designated on the basis of the risk from tsunami.

The impact on flood extent and risk due to the dynamics of tsunami compared to tide and surge events is however not known or derivable at this stage. Further analysis of this risk is required with particular emphasis on localised areas that could be particularly vulnerable to such floods due to local bathymetric, topographical and hydraulic conditions, and on the specific hydro-dynamic effects of tsunami waves.

6.2.4. Areas Benefiting from Flood Relief Schemes

Some areas that have been subject to serious flooding in the past now enjoy some protection from flooding through flood relief schemes built by the OPW or Local Authorities.

While the flood risk to these communities has been substantially reduced, there remains a residual risk from particularly extreme events that could overwhelm the defences. In addition, the monitoring and maintenance of these schemes should form part of the Flood Risk Management Plan developed through the CFRAM Studies.

As a result, and notwithstanding the reduction in risk due to the flood relief schemes, communities where formal flood relief schemes have been implemented have been designated as AFAs.

6.3. INFRASTRUCTURAL SOURCES OF FLOODING

The decision on the designation of AFAs due to flood risk related to infrastructure is a matter for the owners of the infrastructure, i.e., the Local Authorities, ESB and Waterways Ireland.

The views and submissions made through the consultation process on the draft PFRA informed the decisions on the designation of AFAs.

6.3.1. Urban Storm-Water Drainage Systems

Areas at risk due to flooding from under-capacity of urban storm-water drainage systems have been identified in Appendices C.4 and E.3.

6.3.2. Reservoirs

As described herein, it has not been possible to undertake a predictive risk assessment due to breaches of reservoir embankments or walls with any reliability based on available or readily-derivable information, and so no AFAs have been designated on this basis.

The Local Authorities have reported no breaches of reservoirs embankments or walls, or past significant flood events due to the breach or collapse of reservoirs. Taking the absence of past reservoir failures, and the number and average age of reservoirs in Ireland (many hundreds of reservoirs nationally, with an estimated average age of over 30 years), it may be deduced that the likelihood of flooding due to a reservoir breach is very low. Given that likelihood is an integral component of risk, it can be reasonably assumed therefore at this stage that risk associated with the breach of reservoirs is low, i.e., not significant.

As such, no probable or possible AFAs were designated on the basis of risk from reservoirs. The risk from reservoirs should however be assessed in further detail to redress the current absence of information.

6.3.3. Water Supply System

Flood events due to burst water mains have occurred in the past. The locations where such flood events have been reported by the Local Authorities as having caused notable damage, or those recorded through the historic flood risk assessment, are listed in Appendix C.4.

As described herein, it has not been possible to undertake a predictive risk assessment due to burst water mains with any reliability based on available or readily-derivable information.

6.3.4. ESB

ESB have undertaken the PFRA with respect to the infrastructure that they own, operate and maintain and that could give rise to flood risk, e.g., dams and embankments retaining water. The process and outcomes of this work is detailed in the PFRA Report by ESB.

The conclusion of the work by ESB is that the relevant infrastructure does not give rise to significant flood risk. Reasoning and details of this conclusion can be found in the aforementioned report.

6.3.5. Waterways Ireland

Waterways Ireland have undertaken the PFRA with respect to the infrastructure that they own, operate and maintain and that could give rise to flood risk, e.g., embanked sections of canal. The process and outcomes of this work is detailed in the PRFA Report by Waterways Ireland.

The conclusion of the work by Waterways Ireland is that the relevant infrastructure does not give rise to significant flood risk. Reasoning and details of this conclusion can be found in the aforementioned report.

6.4. CROSS-BORDER COORDINATION

The 'Floods' Directive [Article 4(3) and Article 5(2)] requires that Member States which share a cross-border river basin exchange information when undertaking the PFRA, and coordinate the identification of AFAs.

The OPW has a long-standing working relationship with the Rivers Agency, an executive agency within the Northern Ireland Department of Agriculture and Rural Development, who are the Competent Authority for implementation of the 'Floods' Directive in the North. Since 2008 there has been a number of meetings and the exchange of information at both a technical and high level specifically related to the EU 'Floods' Directive to ensure that there is full coordination as appropriate.

The methods used for undertaking the PFRA in both jurisdictions are similar, but have some differences due to different data formats and availability and different legacy work and context. The thresholds for defining significance are however broadly comparable.

There are a number of probable or possible AFAs in cross-border river basins and in the border counties. However, the only probable AFA where there could be direct cross-border effects and where particular cross-border coordination is required is Lifford, Co. Donegal, that sits across the River Foyle from Strabane, Co. Tyrone in the North.

7. FINAL DESIGNATION OF AFAS

The process and outcomes of the draft PFRA are set out in the preceding sections and appendices of this report. This includes the identification of probable and possible Areas for Further Assessment (AFAs) related to natural sources of flooding.

Other EU Member States have used similar approaches to the process used in Ireland for undertaking the PFRA.

The draft PFRA was subject to public consultation that was undertaken over the Summer of 2011. Submissions on the PFRA were made either to the OPW or the relevant Local Authorities.

The views and information provided through the consultation process were reviewed and, along with outcomes of the on-site inspections (see Section 5.2) and any other information arising, taken into account in the final designation of the AFAs.

The definition of AFAs based on flood risk related to infrastructure owned by Local Authorities is a matter for the Local Authorities to decide upon. The ESB and Waterways Ireland have undertaken PFRA assessments with respect to their own infrastructure and have concluded that there is not a significant risk.

Details of the outcome of the public consultation process, and the final list of areas designated as AFAs, are available from the Report on the Designation of Areas for Further Assessment, which is available on the National CFRAM Programme website. No changes to the PFRA process set out herein were deemed necessary as a result of the consultation process and submissions received.

(Blank Page)

APPENDIX A

ARTICLES 4 AND 5 OF THE EU 'FLOODS' DIRECTIVE

CHAPTER II: PRELIMINARY FLOOD RISK ASSESSMENT

Article 4

1. Member States shall, for each river basin district, or unit of management referred to in Article 3(2)(b), or the portion of an international river basin district lying within their territory, undertake a preliminary flood risk assessment in accordance with paragraph 2 of this Article.

2. Based on available or readily derivable information, such as records and studies on long term developments, in particular impacts of climate change on the occurrence of floods, a preliminary flood risk assessment shall be undertaken to provide an assessment of potential risks. The assessment shall include at least the following:

(a) maps of the river basin district at the appropriate scale including the borders of the river basins, sub-basins and, where existing, coastal areas, showing topography and land use;

(b) a description of the floods which have occurred in the past and which had significant adverse impacts on human health, the environment, cultural heritage and economic activity and for which the likelihood of similar future events is still relevant, including their flood extent and conveyance routes and an assessment of the adverse impacts they have entailed;

(c) a description of the significant floods which have occurred in the past, where significant adverse consequences of similar future events might be envisaged;

and, depending on the specific needs of Member States, it shall include:

(d) an assessment of the potential adverse consequences of future floods for human health, the environment, cultural heritage and economic activity, taking into account as far as possible issues such as the topography, the position of watercourses and their general hydrological and geomorphological characteristics, including floodplains as natural retention areas, the effectiveness of existing manmade flood defence infrastructures, the position of populated areas, areas of economic activity and long-term developments including impacts of climate change on the occurrence of floods.

3. In the case of international river basin districts, or units of management referred to in Article 3(2)(b) which are shared with other Member States, Member States shall ensure that exchange of relevant information takes place between the competent authorities concerned.

4. Member States shall complete the preliminary flood risk assessment by 22 December 2011.

Article 5

1. On the basis of a preliminary flood risk assessment as referred to in Article 4, Member States shall, for each river basin district, or unit of management referred to in Article 3(2)(b), or portion of an international river basin district lying within their territory, identify those areas for which they conclude that potential significant flood risks exist or might be considered likely to occur.

2. The identification under paragraph 1 of areas belonging to an international river basin district, or to a unit of management referred to in Article 3(2)(b) shared with another Member State, shall be coordinated between the Member States concerned.

APPENDIX B

TECHNICAL PFRA REPORTS

The Technical PFRA Reports available from the National CFRAM Programme website (www.cfram.ie) are listed below.

PREDICTIVE FLOOD RISK ASSESSMENT

The following report further details the predictive assessment method undertaken for the natural sources of flooding, and for sites potentially prone to flooding due to under-capacity of storm-water drainage systems.

Preliminary Flood Risk Assessment, The Predictive Assessment of Potentially Significant Flood Risk, Mott MacDonald, 2011

PREDICTIVE FLOOD MAPPING

The following reports describe the development of indicative, predicted flood extent information for a range of sources of flooding.

Flooding from Rivers (Fluvial)

Preliminary Flood Risk Assessment, Fluvial Flood Hazard Mapping – Normal Depth Method, Compass Informatics, 2011

Coastal or Tidal Flooding

Irish Coastal Protection Strategy Study, Phase 2 - South East Coast, Work Packages 2, 3 & 4A - Technical Report - IBE0104, RPS, June 2010

Irish Coastal Protection Strategy Study, Phase 3a - North East Coast, Work Packages 2, 3 & 4A - Technical Report - IBE0071, RPS, June 2010

Irish Coastal Protection Strategy Study, Phase 3b - South Coast, Work Packages 2, 3 & 4A - Technical Report – IBE0071, RPS, May 2011

Note: Reports for the remainder of the coast are currently under preparation

Groundwater Flooding

Preliminary Flood Risk Assessment, Groundwater Flooding, Mott MacDonald, 2010

Pluvial flooding

Flood Risk Assessment and Management Programme: National Pluvial Screening Project for Ireland – Rep EX6335/2.0, HR Wallingford, November 2010

VULNERABILITY ASSESSMENTS

The following reports describe the assessment of the vulnerability to damage from floods for particular receptors.

National Monuments

Preliminary Flood Risk Assessment, Methodology for Classifying the Vulnerability of National Monuments from Flooding in The Republic of Ireland, Mott MacDonald, 2011

Environmentally Designated Sites (SACs, SPAs)

Preliminary Flood Risk Assessment, Flood Vulnerability Assessment of Natura 2000 Sites, Mott MacDonald and Bird Watch Ireland, 2011

INFRASTRUCTURE-RELATED FLOODING

The following reports describe the PFRA undertaken by the ESB and Waterways Ireland with respect to risk that could arise from infrastructure they manage:

ESB

Preliminary Flood Risk Assessment Report, ESB, 2011

Waterways Ireland

Preliminary Flood Risk Assessment Report, Waterways Ireland, 2011

APPENDIX C

HISTORIC FLOOD RISK ASSESSMENT

C.1 RECORDS OF NUMBER OF PAST FLOOD EVENTS PER LOCATION

The determination of the Historic Hazard Category is defined in Section 3.3.2 of the main body of the report. The locations with a Historic Hazard Category of 2 or above are listed below.

County	Name Of Location	No. of Past Floods	Historic Hazard Category
Carlow	Carlow_&_Env	16	4
Carlow	Tullow	6	3
Carlow	Ballygowan	3	2
Carlow	Leighlinbridge	3	2
Cavan	Cavan_&_Environs	8	2
Cavan	Derreskit	2	2
Clare	Ennis_&_Env	13	4
Clare	O' Briensbridge	5	3
Clare	Bellisle	4	2
Clare	Cloonlara	3	2
Clare	Inishlosky	3	2
Clare	Strawickeen	3	2
Clare	Summerhill	3	2
Clare	Ballycar (New-Market-On-Fergus)	3	2
Clare	Clooncarhy	3	2
Clare	Knockalisheen	3	2
Clare	Sixmilebridge	3	2
Clare	Cappavilla North	2	2
Clare	Cappavilla South	2	2
Clare	Ardataggle	2	2
Clare	Ardcloony	2	2
Clare	Doonass Demesne	2	2
Clare	Drummeen	2	2
Clare	Errina	2	2
Clare	Illaunyregan	2	2
Clare	Kildoorus	2	2
Clare	O'Briens Bridge	2	2
Clare	Rineroe	2	2
Clare	Springfield	2	2
Clare	Athlunkard	2	2
Clare	Cragleagh	2	2
Clare	Drumcaran More	2	2
Clare	Garraun	2	2
Clare	Gilloge	2	2
Clare	Kilbreckan	2	2
Clare	Shanvogh	2	2
Clare	Skehanagh	2	2
Cork	Cork City And Suburbs	71	4
Cork	Mallow_&_Env	15	4
Cork	Fermoy_&_Env	11	4
Cork	Skibbereen	11	4
Cork	Dunmanway North	9	3
Cork	Bantry	6	3
Cork	Ballygarvan	5	3

Cork	Carrigaline	5	3
Cork	Bandon_&_Env	12	2
Cork	Killavullen	6	2
Cork	Clonakilty_&_Env	6	2
Cork	Kinsale_&_Env	6	2
Cork	Blarney	4	2
Cork	Kanturk	4	2
Cork	Kilnaglery	4	2
Cork	Tower	4	2
Cork	Abbeystrowry	4	2
Cork	Carrigfadda	4	2
Cork	Coolnagarrane	4	2
Cork	Curragh	4	2
Cork	Gortnaclohy	4	2
Cork	Lurriga	4	2
Cork	Marsh	4	2
Cork	Carrigaline West	3	2
Cork	Firville West	3	2
Cork	Crosshaven	3	2
Cork	Passage West_& Env	3	2
Cork	Shanacloon	3	2
Cork	Youghal_&_Env	3	2
Cork	Ballydaniel More	2	2
Cork	Ballygarvan	2	2
Cork	Ballyderown	2	2
Cork	Banteer	2	2
Cork	Coolroe More	2	2
Cork	Knockeennagearagh	2	2
Cork	Milstreet	2	2
Cork	Ashgrove	2	2
Cork	Killumney, Cork	2	2
Cork	Macroom_&_Env	2	2
Cork	Rearour And Barrettshill	2	2
Cork	Ardcahan	2	2
Cork	Nedinagh West	2	2
Donegal	Letterkenny_&_Environs	14	3
Donegal	Newtown Cunningham	6	2
Donegal	Ballybofey - Stranorlar	5	2
Donegal	Ballyhanna	2	2
Dublin	Dublin City and Suburbs	224	4
Dublin	Swords	10	3
Dublin	Rush	6	2
Dublin	Skerries	5	2
Dublin	Naul	4	2
Dublin	Cooldrinagh	4	2
Dublin	Malahide	4	2
Dublin	Newcastle	4	2
Dublin	Donabate	3	2
Dublin	Burrow {Ed Howth}	3	2
Dublin	Kinsaley	3	2
Dublin	Portmarnock	3	2
Dublin	Turnapin Great	3	2
Dublin	Balbriggan_&_Environs	2	2
Dublin	Killossery	2	2
Galway	Ballinasloe_&_Env	11	3
Galway	Baile Chlair	7	3
Galway	Galway City And Suburbs	7	2
Galway	Lackan (Dunkellin By)	6	2
Galway	Tiernevin	6	2
Galway	Balrobuck Beg	5	2
Galway	Ballylee (Kiltartan By)	4	2
Galway	Curraghmore (Ed Clare Galway)	4	2

Galway	Caherpeak West	4	2
Galway	Coole Demesne	4	2
Galway	Gort	4	2
Galway	Killomoran	4	2
Galway	Newhall	4	2
Galway	Peterswell	4	2
Galway	Pollacurra	4	2
Galway	Shanvally (Kiltartan By)	4	2
Galway	Skehanagh (Kiltartan By)	4	2
Galway	Turloughnacloghdoo Commons	4	2
Galway	Clonfert (Butson)	3	2
Galway	Lismanny	3	2
Galway	Ballymore (Ed Craughwell)	3	2
Galway	Cahermore	3	2
Galway	Clogharevaun	3	2
Galway	Crannagh (Ed Kiltartan)	3	2
Galway	Doonowen	3	2
Galway	Garryland	3	2
Galway	Killarriv	3	2
Galway	Newtown (Ed Beagh)	3	2
Galway	Raheen Demesne	3	2
Galway	Shantallow (Ed Ardrahan)	3	2
Galway	Carta	2	2
Galway	Clonfert Demesne	2	2
Galway	Clonfert North (Seymour)	2	2
Galway	Costello's Island	2	2
Galway	Craghalan Little	2	2
Galway	Abbey (Leitrim By)	2	2
Galway	Bishops Islands	2	2
Galway	Bishops Islands (Part Of)	2	2
Galway	Esker (Longford By)	2	2
Galway	Inchinaskeagh	2	2
Galway	Inishee	2	2
Galway	Lehinch (Longford By)	2	2
Galway	Reask (Longford By)	2	2
Galway	Annaghcorrib	2	2
Galway	Garryduff (Longford By)	2	2
Galway	Kylemore (Longford By)	2	2
Galway	Aggard More	2	2
Galway	Ballinrooaun (Loughrea By)	2	2
Galway	Ballyaneen North	2	2
Galway	Ballybackagh (Loughrea By)	2	2
Galway	Ballyboy (Dunkellin By)	2	2
Galway	Ballybuck North	2	2
Galway	Ballykilladea	2	2
Galway	Ballylahy	2	2
Galway	Ballynabucky (Kiltartan By)	2	2
Galway	Ballynamantan	2	2
Galway	Ballynastaig (Kiltartan By)	2	2
Galway	Blackrock	2	2
Galway	Bullaunagh (Kiltartan By)	2	2
Galway	Bullaunagh (Loughrea By)	2	2
Galway	Caherglassaun	2	2
Galway	Carrowbaun East	2	2
Galway	Carrowbaun West	2	2
Galway	Carrownavohanaun	2	2
Galway	Castleboy	2	2
Galway	Castlequarter (Kiltartan By)	2	2
Galway	Castletown (Kiltartan By)	2	2
Galway	Cloghroak	2	2
Galway	Cloonanearla	2	2
Galway	Corker	2	2

Galway	Crannagh (Ed Cahermore)	2	2
Galway	Dromorehill	2	2
Galway	Garracloon South	2	2
Galway	Glenbrack	2	2
Galway	Gortaloman	2	2
Galway	Gortard (Loughrea By)	2	2
Galway	Grannagh (Loughrea By)	2	2
Galway	Killinny East	2	2
Galway	Knockaunatouk	2	2
Galway	Lecknabegga	2	2
Galway	Limepark North	2	2
Galway	Limepark South	2	2
Galway	Lisheenacrannagh	2	2
Galway	Lissadulta	2	2
Galway	Loughaunawadda	2	2
Galway	Newtown (Ed Kiltartan)	2	2
Galway	Newtown (Regun)	2	2
Galway	Rahaly	2	2
Galway	Rathbaun (Dunkellin By)	2	2
Galway	Rathcosgry	2	2
Galway	Rinneen (Ed Kiltartan)	2	2
Galway	Shigaunagh	2	2
Kerry	Tralee_&_Env	13	3
Kerry	Kenmare	6	2
Kerry	Ballymalis	4	2
Kerry	Curreal	3	2
Kerry	Lixnaw	3	2
Kerry	Killarney_&_Env	2	2
Kerry	Ballyouneen	2	2
Kerry	Tullamore(Ed Shronowen)	2	2
Kildare	Leixlip	12	4
Kildare	Celbridge	5	3
Kildare	Athy_&_Env	9	2
Kildare	Commons Upper	6	2
Kildare	Kishawanny Lower	5	2
Kildare	Newbridge_&_Env	5	2
Kildare	Maynooth	4	2
Kildare	Straffan	4	2
Kildare	Commons(Salt South By)	3	2
Kildare	Johnstown	3	2
Kildare	Treadstown	3	2
Kildare	Turnings Lower	3	2
Kildare	Turnings Upper	3	2
Kildare	Balyoulster, Kildare	2	2
Kildare	Confey	2	2
Kildare	Kill	2	2
Kildare	Killadoon	2	2
Kildare	Laraghbryan East	2	2
Kildare	Wheatfield Upper	2	2
Kildare	Ballitore	2	2
Kilkenny	Kilkenny_&_Env	47	4
Kilkenny	Graiguenamanagh	6	2
Kilkenny	Callan	5	2
Kilkenny	Inistioge	5	2
Kilkenny	Thomastown	5	2
Kilkenny	Piltown	4	2
Laois	Portlaoise_&_Env	12	3
Laois	Portarlington	10	2
Laois	Mountrath	3	2
Leitrim	Carrick-On-Shannon	3	2
Leitrim	Dromod	3	2
Leitrim	Clooncumber	2	2

Leitrim	Cloonfeacle	2	2
Leitrim	Cloonmorris	2	2
Leitrim	Adereen	2	2
Leitrim	Annaduff	2	2
Leitrim	Attirory	2	2
Leitrim	Ballynacleigh	2	2
Leitrim	Caldragh	2	2
Leitrim	Coraughrim	2	2
Leitrim	Cornacorroo	2	2
Leitrim	Corryolus	2	2
Leitrim	Deffier	2	2
Leitrim	Derrintonny	2	2
Leitrim	Derrybrack	2	2
Leitrim	Derryoughter	2	2
Leitrim	Doora	2	2
Leitrim	Drumgeaglom	2	2
Leitrim	Drumhierny	2	2
Leitrim	Drumleague	2	2
Leitrim	Drumod More	2	2
Leitrim	Drumsna	2	2
Leitrim	Gort	2	2
Leitrim	Gortinee	2	2
Leitrim	Hartley	2	2
Leitrim	Jamestown	2	2
Leitrim	Knockadrinan	2	2
Leitrim	Leitrim	2	2
Leitrim	Mullagh (Mohill By)	2	2
Leitrim	Pollnagappul	2	2
Leitrim	Portaneoght	2	2
Leitrim	Rinnacurreen	2	2
Leitrim	Townparks	2	2
Leitrim	Aghavore	2	2
Limerick	Limerick City And Suburbs	73	4
Limerick	Castleconnell	7	3
Limerick	Cappamore	8	2
Limerick	Foynes	5	2
Limerick	Rathkeale	5	2
Limerick	Ballyvollane	5	2
Limerick	Ballygrennan (Ed Limerick North Rural)	5	2
Limerick	Lacka (Ed Castleconnell)	4	2
Limerick	Castletroy	4	2
Limerick	Athea	3	2
Limerick	Balliniska	3	2
Limerick	Creggane	3	2
Limerick	Ballysimon	3	2
Limerick	Fairyhall	3	2
Limerick	Garryglass	3	2
Limerick	Knockanbaun	3	2
Limerick	Montpelier	3	2
Limerick	Portcrusha	3	2
Limerick	Prospect (Ed Ballyvarra)	3	2
Limerick	Rivers	3	2
Limerick	Towlerton	3	2
Limerick	Clonconane	3	2
Limerick	Coolbane	2	2
Limerick	Hermitage	2	2
Limerick	Kilbane	2	2
Limerick	Newgarden North	2	2
Limerick	Part Of Singland	2	2
Limerick	Reboge Meadows	2	2
Limerick	Stradbally North	2	2
Longford	Longford_&_Env	9	2

Longford	Knappoge (Longford By)	4	2
Longford	Aghakeel	3	2
Longford	Annaghcooleen	3	2
Longford	Ballynahinch	3	2
Longford	Commons South	3	2
Longford	Rathcline	3	2
Longford	Saints Island	3	2
Longford	Cloonageeher	2	2
Longford	Cloonart North	2	2
Longford	Cloonart South	2	2
Longford	Cloonbearla	2	2
Longford	Cloonbony	2	2
Longford	Cloondara	2	2
Longford	Clooneen(Cox)	2	2
Longford	Clooniher	2	2
Longford	Cloonkeel	2	2
Longford	Aghamore (Rathcline By)	2	2
Longford	Agharanagh (Rathcline By)	2	2
Longford	Annagh (Rathcline By)	2	2
Longford	Ballykenny	2	2
Longford	Ballyminion	2	2
Longford	Bleanavoher	2	2
Longford	Brianstown	2	2
Longford	Cashel	2	2
Longford	Castleforbes Demesne	2	2
Longford	Claras	2	2
Longford	Cleraun	2	2
Longford	Collum	2	2
Longford	Commons North	2	2
Longford	Corrool (Fox)	2	2
Longford	Corrool (Kenny)	2	2
Longford	Cullentragh	2	2
Longford	Curreen	2	2
Longford	Derrycolumb	2	2
Longford	Derrymacar	2	2
Longford	Derrynabuntale	2	2
Longford	Derrynagalliagh	2	2
Longford	Drumnee	2	2
Longford	Edera	2	2
Longford	Forthill	2	2
Longford	Glebe (Longford By)	2	2
Longford	Killeen (Longford By)	2	2
Longford	Kilnacarrow (Rathcline By)	2	2
Longford	Lanesborough	2	2
Longford	Lismagawley Meadow	2	2
Longford	Lissagernal	2	2
Longford	Pollagh	2	2
Longford	Portanure	2	2
Louth	Drogheda_&_Env	25	4
Louth	Dundalk_&_Environs	21	3
Louth	Corbollis	4	2
Louth	Baltray	4	2
Louth	Carlingford	3	2
Louth	Townparks	3	2
Mayo	Ballina _&_ Environs	6	2
Mayo	Gortanierin	3	2
Mayo	Bellagelly South	3	2
Meath	Commons	10	4
Meath	Navan_&_Environs	12	3
Meath	Trim_&_Environs.	12	3
Meath	Layt_Bett_Mor	11	3
Meath	Balreask Old	5	2

Meath	Nobber	3	2
Meath	Castlefarm	3	2
Meath	Rathregan	3	2
Meath	Drumcondra	2	2
Meath	Ashfield Or Screeboge	2	2
Meath	Ballinter	2	2
Meath	Derrinydaly	2	2
Meath	Dowdstown	2	2
Meath	Dunmoe	2	2
Meath	Ferganstown And Ballymacon	2	2
Meath	Harlinstown	2	2
Meath	Leshemstown	2	2
Meath	Slane	2	2
Meath	Ashbourne	2	2
Meath	Clonee Village	2	2
Meath	Dunboyne	2	2
Monaghan	Annaghkilly	10	4
Monaghan	Monaghan_&_Environs	4	2
Monaghan	Bellanode	2	2
Offaly	Tullamore_&_Env	8	2
Offaly	Banagher	4	2
Offaly	Shannonbridge	4	2
Offaly	Bracknagh	3	2
Offaly	Drumcaw Or Mountlucas	3	2
Offaly	Cloniffeen	3	2
Offaly	Clonony Beg	3	2
Offaly	Curraghavarna And Portavolla	3	2
Offaly	Banragh Island	3	2
Offaly	Derryholmes Or Timolin And Derryharan	3	2
Offaly	Kilmeelchon	3	2
Offaly	Moystown Demesne	3	2
Offaly	Cloncraff Or Bloomhill	3	2
Offaly	Creevagh	3	2
Offaly	Bullock Island	2	2
Offaly	Caplevane	2	2
Offaly	Carrowmanagh	2	2
Offaly	Charlestown	2	2
Offaly	Clonmacnoise	2	2
Offaly	Cogran	2	2
Offaly	Curraghlahan	2	2
Offaly	Cushcallow Or Cloncallow	2	2
Offaly	Ash Island	2	2
Offaly	Ballymacoolaghan	2	2
Offaly	Birds Island	2	2
Offaly	Gallaghers Island	2	2
Offaly	Garrymore	2	2
Offaly	Grants Island	2	2
Offaly	Haughton's Island	2	2
Offaly	Kilcormac	2	2
Offaly	Killaphort	2	2
Offaly	Kylebeg Or Banagher	2	2
Offaly	Lecarrow Glebe Or Britannia	2	2
Offaly	Lisclooney	2	2
Offaly	Macnahanny Or Ashgrove	2	2
Offaly	Macoghlan's Island	2	2
Offaly	Minus Island	2	2
Offaly	Mullaghakaraun	2	2
Offaly	Park (Garrycastle By)	2	2
Offaly	Clonascra	2	2
Offaly	Cloniff	2	2
Offaly	Clorhane	2	2
Offaly	Raghra	2	2

Roscommon	Boyle_&_Environs	6	2
Roscommon	Raghrabeg	5	2
Roscommon	Cloonown	5	2
Roscommon	Cloonburren	4	2
Roscommon	Bogganfin	4	2
Roscommon	Crannagh	4	2
Roscommon	Drumlosh	4	2
Roscommon	Cloonbeggaun	3	2
Roscommon	Clooncah	3	2
Roscommon	Clooneigh	3	2
Roscommon	Cloonfad Beg	3	2
Roscommon	Cloongownagh	3	2
Roscommon	Clooniff	3	2
Roscommon	Cloonlarge	3	2
Roscommon	Cloonmore	3	2
Roscommon	Annaghmore	3	2
Roscommon	Ballycummin	3	2
Roscommon	Ballyleague	3	2
Roscommon	Ballytoohey	3	2
Roscommon	Callowbeg	3	2
Roscommon	Carnagh East	3	2
Roscommon	Carrickynaghtan and Garrynagawna Bog	3	2
Roscommon	Cleaheen	3	2
Roscommon	Cloonown	3	2
Roscommon	Cloonteem	3	2
Roscommon	Corgowan	3	2
Roscommon	Cornaseer	3	2
Roscommon	Curraghnaboll	3	2
Roscommon	Derrineel	3	2
Roscommon	Drinagh	3	2
Roscommon	Gubbarudda	3	2
Roscommon	Kilnamanagh	3	2
Roscommon	Lavagh	3	2
Roscommon	Roosky	3	2
Roscommon	Roosky	3	2
Roscommon	Tumna	3	2
Roscommon	Woodbrook	3	2
Roscommon	Cloonacarrow	2	2
Roscommon	Cloonaddra	2	2
Roscommon	Cloonaufill	2	2
Roscommon	Cloonaverry	2	2
Roscommon	Clooncommon More	2	2
Roscommon	Clooneen (Blakeny)	2	2
Roscommon	Clooneigh	2	2
Roscommon	Clooneskert	2	2
Roscommon	Cloonfad	2	2
Roscommon	Cloonfad	2	2
Roscommon	Cloonfad More	2	2
Roscommon	Cloonglasny Beg	2	2
Roscommon	Cloonmaan	2	2
Roscommon	Cloonmore	2	2
Roscommon	Cloonmustra	2	2
Roscommon	Aghafin	2	2
Roscommon	Annagh	2	2
Roscommon	Annaghbeg	2	2
Roscommon	Annaghmona	2	2
Roscommon	Ardanaffrin	2	2
Roscommon	Ballagh	2	2
Roscommon	Ballyclare	2	2
Roscommon	Ballyglass	2	2
Roscommon	Ballymagrine	2	2
Roscommon	Ballymartin	2	2

Roscommon	Barry Beg	2	2
Roscommon	Barry More	2	2
Roscommon	Bellaugh	2	2
Roscommon	Brackloon	2	2
Roscommon	Bunnaribba	2	2
Roscommon	Cappaleitrim	2	2
Roscommon	Carrickynaghtan	2	2
Roscommon	Carrigeen	2	2
Roscommon	Carrigeen	2	2
Roscommon	Carrowmurragh	2	2
Roscommon	Carrownamaddy	2	2
Roscommon	Carrowndrisha	2	2
Roscommon	Carrownure Lower	2	2
Roscommon	Carrownure Upper	2	2
Roscommon	Carrowphadeen	2	2
Roscommon	Cartron (Ed Danesfort)	2	2
Roscommon	Cartron (Hartland)	2	2
Roscommon	Cartron (King)	2	2
Roscommon	Charlestown	2	2
Roscommon	Cloonshannagh (Ed Bumlin)	2	2
Roscommon	Cloonskeeveen	2	2
Roscommon	Cloontuskert	2	2
Roscommon	Cooltona	2	2
Roscommon	Coolumber	2	2
Roscommon	Cordrehid	2	2
Roscommon	Corgullion	2	2
Roscommon	Corkeenagh	2	2
Roscommon	Corraun	2	2
Roscommon	Correen	2	2
Roscommon	Correenbeg	2	2
Roscommon	Corry	2	2
Roscommon	Cortober	2	2
Roscommon	Crannagh More	2	2
Roscommon	Creggan	2	2
Roscommon	Creggan	2	2
Roscommon	Cregganabeaka	2	2
Roscommon	Cruit	2	2
Roscommon	Cuilbalkeen	2	2
Roscommon	Cuilkeel	2	2
Roscommon	Cuillard	2	2
Roscommon	Cuiltyconeen	2	2
Roscommon	Cuiltyconway	2	2
Roscommon	Cuiltyshinnoge	2	2
Roscommon	Culliaghy	2	2
Roscommon	Danesfort	2	2
Roscommon	Davis's Island	2	2
Roscommon	Dergraw	2	2
Roscommon	Derreenannagh	2	2
Roscommon	Derrycashel	2	2
Roscommon	Usna	2	2
Roscommon	Warren	2	2
Roscommon	Derryfeacle	2	2
Roscommon	Derryhanee	2	2
Roscommon	Derrymacstur	2	2
Roscommon	Derrynadooey	2	2
Roscommon	Derryonogh	2	2
Roscommon	Doovoge	2	2
Roscommon	Drishoge	2	2
Roscommon	Drumagissaun	2	2
Roscommon	Drumboylan	2	2
Roscommon	Drumcleavry	2	2
Roscommon	Drumharlow	2	2

Roscommon	Drumman More	2	2
Roscommon	Drummod	2	2
Roscommon	Erra	2	2
Roscommon	Fearagh	2	2
Roscommon	Foxhill	2	2
Roscommon	Galey	2	2
Roscommon	Gallagh	2	2
Roscommon	Gardentown	2	2
Roscommon	Garrymona Island	2	2
Roscommon	Garrynagawna	2	2
Roscommon	Gillstown	2	2
Roscommon	Glen	2	2
Roscommon	Grange (Ed Ballygarden)	2	2
Roscommon	Hughestown	2	2
Roscommon	Inchinalee	2	2
Roscommon	Kilbarry	2	2
Roscommon	Kilgarve	2	2
Roscommon	Kilmacarril	2	2
Roscommon	Kilmore (Ed Lecarrow)	2	2
Roscommon	Kilnacloghy	2	2
Roscommon	Knockanyconor	2	2
Roscommon	Knockhall	2	2
Roscommon	Lack	2	2
Roscommon	Lackagh	2	2
Roscommon	Lackan (Ed Kilteevan)	2	2
Roscommon	Lecarrow	2	2
Roscommon	Long_Island	2	2
Roscommon	Longnamuck	2	2
Roscommon	Lurga	2	2
Roscommon	Lustia	2	2
Roscommon	Meelick (Ed Kilmore)	2	2
Roscommon	Milltown	2	2
Roscommon	Moneenbog	2	2
Roscommon	Moneyduff	2	2
Roscommon	Mountallen	2	2
Roscommon	Mountplunket	2	2
Roscommon	Moyglass (Ed Cloonteem)	2	2
Roscommon	Moyvannan	2	2
Roscommon	Muckanagh	2	2
Roscommon	Part Of Cuilbalkeen	2	2
Roscommon	Part Of Cuillard	2	2
Roscommon	Portnahinch	2	2
Roscommon	Powellshill	2	2
Roscommon	Rattinagh	2	2
Roscommon	Rinanny	2	2
Roscommon	Rinnagan	2	2
Roscommon	Rooaun	2	2
Roscommon	Roosky New	2	2
Roscommon	Rushport	2	2
Roscommon	Shanballymore	2	2
Roscommon	Skeagh	2	2
Roscommon	Srabragan	2	2
Roscommon	Tawnagh More	2	2
Roscommon	Tobberataravan	2	2
Roscommon	Toberpatrick	2	2
Roscommon	Tooloscan	2	2
Roscommon	Trean	2	2
Roscommon	Tulrush	2	2
Sligo	Sligo_&_Env	8	2
Sligo	Killaraght	6	2
Sligo	Bunduff	5	2
Sligo	Quarryfield	5	2

Sligo	Kilbrattan	4	2
Sligo	Tawnymucklagh	2	2
Sligo	Bunnanilra	2	2
Tipperary	Clonmel_&_Env	18	4
Tipperary	Birdhill	5	3
Tipperary	Carrick-On-Suir	6	2
Tipperary	Nenagh_&_Env	6	2
Tipperary	Skeheenaranky	5	2
Tipperary	Templemore_&_Env	4	2
Tipperary	Lehinch	4	2
Tipperary	Redwood	4	2
Tipperary	Ardfinnan	3	2
Tipperary	Burgagery-Lands West	3	2
Tipperary	Clogheen	3	2
Tipperary	Fethard	3	2
Tipperary	Marlfield	3	2
Tipperary	Toberaheena	3	2
Tipperary	Inishlounaght	2	2
Tipperary	Toor More	2	2
Tipperary	Ballyquirk	2	2
Waterford	Waterford City and Suburbs	14	3
Waterford	Dungarvan_&_Env	14	3
Waterford	Tramore_&_Env	6	2
Waterford	Garrison	4	2
Waterford	Coolfinn	3	2
Waterford	Greenan	3	2
Waterford	Poulnagunoge	3	2
Waterford	Dunmore_East	3	2
Waterford	Passage East	3	2
Waterford	Templeyvrick	3	2
Waterford	Ballyrafter	3	2
Waterford	Mocollop	3	2
Waterford	Ballindysert	2	2
Waterford	Clashanahy	2	2
Westmeath	Athlone_&_Environs	29	4
Westmeath	Mullingar_&_Env	9	2
Westmeath	Kilgarvan Glebe	3	2
Westmeath	Cloonbonny	2	2
Westmeath	Ballaghkeeran Big	2	2
Westmeath	Ballaghkeeran Little	2	2
Westmeath	Ballinlough (Kilkenny West By)	2	2
Westmeath	Ballygowlan	2	2
Westmeath	Ballynacliffy	2	2
Westmeath	Ballynahownwood	2	2
Westmeath	Bellaugh	2	2
Westmeath	Bethlehem	2	2
Westmeath	Bleanphuttoge	2	2
Westmeath	Bogganfin	2	2
Westmeath	Bunown	2	2
Westmeath	Canal And Banks	2	2
Westmeath	Cappankelly	2	2
Westmeath	Carrickobreen	2	2
Westmeath	Cartron (Kilkenny West By)	2	2
Westmeath	Clonbonny	2	2
Westmeath	Creaghduff	2	2
Westmeath	Creaghduff South	2	2
Westmeath	Creggan	2	2
Westmeath	Whinning	2	2
Westmeath	Doovoge	2	2
Westmeath	Friars Island	2	2
Westmeath	Garrynafela	2	2
Westmeath	Glassan	2	2

Westmeath	Golden Island	2	2
Westmeath	Hillquarter	2	2
Westmeath	Killeenmore	2	2
Westmeath	Killinure North	2	2
Westmeath	Killinure South	2	2
Westmeath	Kippinstown	2	2
Westmeath	Meehan	2	2
Westmeath	Muckanagh	2	2
Westmeath	Portaneena	2	2
Westmeath	Portlick	2	2
Westmeath	Ross	2	2
Westmeath	Srameen	2	2
Westmeath	Tonagh	2	2
Westmeath	Tullin	2	2
Wexford	Enniscorthy_&_Env	9	3
Wexford	New Ross_&_Env	8	2
Wexford	Coolnahorna	3	2
Wexford	Edermine	3	2
Wexford	Newtown	3	2
Wexford	Banoge	2	2
Wexford	Rossard	2	2
Wexford	Townparks	2	2
Wexford	Wexford_&_Env	2	2
Wexford	Arthurstown, Wexford	2	2
Wicklow	Arklow	18	4
Wicklow	Bray_&_Environs	6	3
Wicklow	Greystones_&_Env	6	2
Wicklow	Threecastles	3	2
Wicklow	Ballinastoe	3	2

C.2. RECORDS OF FINANCIAL DAMAGE FOR PAST FLOODS

County	Location	Flood Event Date	Financial Damage Reported (€) [1]
Carlow	Tullow	November 2002, November 2000 & November 1965	€7.6 million over a 50 year period
Cork	Cork City	6th January 1996	€2,284,000
Cork	Clonakilty	16th December 1989	€635,000
Cork	Mallow	1st November 1980	€3,173,000
Cork	Kanturk	1st November 1980	€467,000
Cork	Skibbereen, Bantry, Ballymakeera, Ballyvourney & Macroom	5th August 1986	€2,538,000
Dublin	River Dodder, Camac, Tolka & Poddle	25/26th August 1986	€7,614,000
Galway	Maam	September 1998	€63,000
	Sixmilebridge	27th January 1995	> €1,269,000
Kerry	Garries	1st November 1980	€162,00
Kerry	River Flesk	5th August 1986	€99,000
Kilkenny	Kilkenny City	25th January 1995	70 buildings – Damage of between €380 – €3,172 per property
Limerick	Limerick City	25th December 1999	€308,00
Tipperary	Clonmel	4th January 1996	€774,000
Tipperary	Clonmel	5th November 2000	€859,000
Tipperary	Cahir	5th November 2000	€290,000
Tipperary	Cashel	5th November 2000	€133,000
Tipperary	Fethard	5th November 2000	€690,000
Tipperary	Tipperary	5th November 2000	€473,000
Waterford	Waterford City	27th October 2004	€12,000 – Only includes cost to City Council

Note 1: Damages quoted in Punts have been converted to Euro and rounded to the nearest thousand euro

(Blank Page)

C.3 RECORDS OF NUMBER OF PROPERTIES FLOODED DURING PAST FLOODS

County	Flood Name - Location	Start Date	No. of Properties Flooded
Carlow	Slaney Tullow Nov 1965	01/11/1965	60
Carlow	Barrow Carlow November 2000	05/11/2000	43
Carlow	Slaney Tullow Nov 2000	05/11/2000	35
Carlow	Barrow Carlow 19th to 26th Nov 2009	19/11/2009	11
Carlow	Barrow Leighlinbridge Nov 2000	05/11/2000	10
Carlow	Derry Clonegall Bridge recurring		5
Carlow	Derry Clonegall Nov 2000	05/11/2000	4
Carlow	Newtown Co Carlow Nov 2000	05/11/2000	2
Carlow	Slaney Rathvilly Nov 2000	05/11/2000	2
Carlow	Ballon recurring		1
Clare	Ennis, Nov 2009	19/11/2009	112
Clare	Fergus Ennis December 1959	27/12/1959	100
Clare	Shannon Banks, Co Clare, Nov 2009	10/11/2009	20
Clare	Owenogarney Sixmilebridge Jan 1995	27/01/1995	14
Clare	Springfield (Cloolara), Co. Clare, Nov 2009	19/11/2009	10
Clare	Doolin, Co. Clare, Nov 2009	19/11/2009	8
Clare	Toonagh County Clare Dec 1999	24/12/1999	4
Clare	Kilkee Recurring		4
Clare	Shannon Quinspool, Parteen Clare Dec 1999	24/12/1999	3
Clare	Clonbony Stream Milltown Malbay Jan 2005	07/01/2005	3
Clare	Ballyvaughan, Co Clare, Nov 2009	19/11/2009	2
Clare	Shannon Carrigerry Clare Recurring		2
Clare	South Galway March 1994 Termon	01/01/1994	2
Clare	Fergus Ennis, Feb 2002	04/02/2002	2
Clare	Ranaghan, Co Clare Nov 2009	19/11/2009	1
Clare	Kilnaboy, Co Clare Nov 2009	19/11/2009	1
Clare	Poulataggle, Co Clare Nov 2009	19/11/2009	1
Clare	Deelin Beg, Caron, Co Clare Nov 2009	19/11/2009	1
Clare	Fahee, Carron, Co Clare, Nov 2009	19/11/2009	1
Clare	Corofin, Co Clare Nov 2009	19/11/2009	1
Clare	Gillogue, Co Clare Nov 2009	19/11/2009	1
Clare	Owenogarney Bunratty Castle Jan 1995	16/01/1995	1
Clare	River Rine at Creevagh Br Dangan L7204 Recurring		1
Cork	Cork City Nov 2009	19/11/2009	764
Cork	Bandon River, Bandon, Nov 2009	19/11/2009	200
Cork	River Ilen, Skibbereen, Nov 2009	19/11/2009	176
Cork	Dalua Kanturk Nov 1980	31/10/1980	178
Cork	Fermoy, Nov 2009	19/11/2009	38
Cork	Bandon Dunmanway October 1996	13/10/1996	25
Cork	River Feagle, Clonakilty, Nov 2009	19/11/2009	20
Cork	Flooding at Ballingeary, Co. Cork 19 Nov 2009	19/11/2009	21
Cork	Palmbury Estate Flooding, Togher, recurring		8
Cork	Sullane Ballymakeery December 2006	07/12/2006	5
Cork	Gurteenroe Macroom 10 January 2008	10/01/2008	4
Cork	Myross Cork Recurring		3
Cork	Leap Ahnancagh Cross Road Cork Recurring		3
Cork	Milltown River Castlefreke August 1997	26/08/1997	2
Cork	Milltown Castlefreke Rathbarry Recurring		2
Cork	Castlefreke Kilkeran Recurring		2
Cork	Water Rock Midleton, Cork Recurring		1
Cork	Glanworth, Mitchelstown, Cork recurring		1
Cork	Tragumna Recurring		1
Cork	Ring Clonakilty Recurring		1
Cork	Inchydoney Island - North Recurring		1
Cork	Ballydaniel Beg Oct 2004	27/10/2004	1

Cork	Ashgrove Oct 2004	27/10/2004	1
Cork	Ashgrove Ballyellane Oct 2004	27/10/2004	1
Cork	White Point Cobh Oct 2004	27/10/2004	1
Cork	Dunisky near Macroom Nov 2000	05/11/2000	1
Cork	Rathcormack Co.Cork 30/01/2009	30/01/2009	1
Cork	Dreenagh,Skibbereen Co.Cork, Dec 2009	31/12/2009	1
Donegal	Eaney Inver Recurring		1
Donegal	Mullaghderg, Donegal Recurring		1
Dublin	Dodder August 1986	25/08/1986	340
Dublin	Dublin City Tidal Feb 2002	01/02/2002	120
Dublin	Griffeen November 2000	05/11/2000	107
Dublin	Poddle August 1986	25/08/1986	85
Dublin	Tolka Richmond Road Drumcondra Nov 2000	05/11/2000	62
Dublin	Tolka September 1931	03/09/1931	54
Dublin	Camac August 1986	25/08/1986	30
Dublin	Wad River Santry Jan 1965	20/01/1965	20
Dublin	Camac Cherrywood Nov 1982	05/11/1982	18
Dublin	Dodder Woodview Cottages Rathfarnham Nov 2000	05/11/2000	15
Dublin	Vernon Avenue Clontarf Road Aug 2004	23/08/2004	15
Dublin	Dodder Avonmore Park Nov 2000	05/11/2000	12
Dublin	Tolka Botanic Ave area August 1986	25/08/1986	10
Dublin	Holmpatrick Skerries Recurring		10
Dublin	Tolka Richmond Road August 1986	25/08/1986	10
Dublin	Seapark Drive Seafield Road Aug 2004	23/08/2004	7
Dublin	Beech Row Ronanstown Recurring		6
Dublin	Little Dargle Dec 1956	25/12/1956	4
Dublin	Hearst Road Donabate Nov 2002	14/11/2002	4
Dublin	Skerries South Beach Holmpatrick Feb 2002	01/02/2002	4
Dublin	Dodder Kiltipper Road Nov 2000	05/11/2000	4
Dublin	Owenadoher Edmondstown Road. Nov 2000	05/11/2000	3
Dublin	Ward North Street Swords Nov 2002	13/11/2002	3
Dublin	Crescent South Shore Rd Rogerstown Feb 2002	01/02/2002	3
Dublin	Shinkeen Hazelhatch River Road Nov 2000	05/11/2000	3
Dublin	Kinsealy Lane Area Oct 2002	20/10/2002	2
Dublin	The Burrow Portrane Feb 2002	01/02/2002	2
Dublin	Torquay Road Foxrock Nov 1982	05/11/1982	2
Dublin	Kilternan Glencullen Road Nov 1982	05/11/1982	2
Dublin	Clontarf Rd Seaview Avenue August 2004	23/08/2004	2
Dublin	Newcastle village Nov 2000	05/11/2000	2
Dublin	Knocklyon Ave Nov 2000	05/11/2000	2
Dublin	Vernon Avenue Kincora Road Aug 2004	23/08/2004	2
Dublin	Santry Nov 2002	12/11/2002	1
Dublin	Dodder Dartry Cottages Nov 2000	05/11/2000	1
Dublin	Mayne Balgriffin Park June 1993	11/06/1993	1
Dublin	Dodder Lower Dodder Road Recurring		1
Dublin	Bloody Stream Howth Near Dart Station Recurring		1
Dublin	Pinnock Hill October 2002	20/10/2002	1
Dublin	Ballyboughal on Naul Road Nov 2002	13/11/2002	1
Dublin	Ballymadrough Donabate Recurring		1
Dublin	The Square Naul Village Undated		1
Dublin	Streamstown to Malahide Road Dublin Undated		1
Dublin	Strand Rd Sutton Feb 2002	01/02/2002	1
Dublin	Greenfield Road Sutton Feb 2002	01/02/2002	1
Dublin	Strand Road Malahide Feb 2002	01/02/2002	1
Dublin	Sydney Avenue Oct 2002	29/10/2002	1
Dublin	Poddle River Whitehall Road June 1993	11/06/1993	1
Dublin	Deansgrange Johnstown Pottery Road Nov 1982	05/11/1982	1
Dublin	Osprey Estate Nov 1982	05/11/1982	1
Dublin	Brighton Cottages Dec 1978	26/12/1978	1

Dublin	Melrose Park Oct 2002	20/10/2002	1
Dublin	Bloody Stream Howth Near Dart Station Oct 2002	21/10/2002	1
Dublin	Bremore Court Balbriggan Nov 2000	05/11/2000	1
Dublin	Pinnock Hill Nov 2002	14/11/2002	1
Dublin	Barton Drive Ballyboden Feb 1994	03/02/1994	1
Dublin	School House Lane Sandyford Nov 1982	26/11/1982	1
Dublin	Liffey Chapelizod St Martins Row Nov 2000	05/11/2000	1
Dublin	Jobstown N81 Nov 2000	05/11/2000	1
Dublin	Mount Carmel Park Firhouse Nov 2000	05/11/2000	1
Dublin	Kilossery Rowlestown Swords Jan 1948	01/01/1948	1
Galway	Ballinasloe, Co. Galway, Nov 2009	19/112009	90+
Galway	Owenriff Oughterard Nov 1999	28/11/1999	19
Galway	Maam Sept 1998	01/09/1998	2
Galway	Corrib Black at Cordorragh, Headford Nov 1999	27/11/1999	1
Galway	Oranmore Frenchfort recurring		1
Galway	Corrib Uggool November 1999	28/11/1999	1
Galway	Knockaneevin Tynagh recurring		1
Kerry	Kenmare River Finnihy 23 October 2008	23/10/2008	37
Kerry	Flesk Glenflesk November 1980	01/11/1980	23
Kerry	Flesk Loo Bridge November 1980	01/11/1980	23
Kerry	Ballylongford recurring		12
Kerry	Ballylongford Village Feb 2002	01/02/2002	10
Kerry	Ardfert recurring		10
Kerry	Finnihy River at Finnihy Banks Estate Recurring		8
Kerry	Inchera Glenbeigh Recurring		8
Kerry	Tralee, Co Kerry, Nov 2009	19/11/2009	6
Kerry	Scarteen Park Kenmare Recurring		6
Kerry	Ballinorig Tralee recurring		5
Kerry	Kenmare Town Square Recurring		5
Kerry	L7606 and Pier Kenmare Recurring		5
Kerry	Cashen village recurring		4
Kerry	Cashen Sea Wall - 10/02/2002	10/02/2002	3
Kerry	Ardnabraher Ballinorig Tralee Aug 1997	31/08/1997	3
Kerry	N71 North of suspension bridge Kenmare Recurring		2
Kerry	Ballycarty Cross Tralee Aug 1997	31/08/1997	1
Kerry	Rahoonagh Ballybunnion Feb 2002	01/02/2002	1
Kerry	Curraghatoosane Listowel Undated		1
Kerry	Dicksgrove Farranfore Recurring		1
Kerry	Coolard recurring		1
Kerry	Gortamullen Recurring		1
Kildare	Waterways Estate, Sallins, Co. Kildare, Nov 09	29/11/2009	103
Kildare	Meadowbrook Estate Parson St Maynooth Nov 2000	05/11/2000	40
Kildare	Silleachain Mill Lane Leixlip Nov 2002	14/11/2002	5
Kildare	Ryewater Dúncarraig, Leixlip Nov 2002	14/11/2002	4
Kildare	Allenswood road, Leixlip Nov 2002	14/11/2002	2
Kildare	Oldtown Road Junction, Celbridge Nov 2002	14/11/2002	2
Kildare	Newbridge Road Naas Recurring		1
Kildare	Prosperous Recurring		1
Kildare	Ardclough Road, Dangan Corner Nov 2002	14/11/2002	1
Kilkenny	Nore Kilkenny March 1947	17/03/1947	236
Kilkenny	Nore Thomastown March 1947	17/03/1947	115
Kilkenny	Nore Kilkenny November 1931	23/11/1931	100
Kilkenny	Nore Johns Quay Johns St area Kilkenny recurring		40
Kilkenny	Kings River Callan March 1947	17/03/1947	40
Kilkenny	Nore Kilkenny Green St Irishtown recurring		30
Kilkenny	Nore John's Quay Kilkenny Jan 1995	25/01/1995	20
Kilkenny	Breagagh Irishtown Kilkenny Jan 1995	25/01/1995	20
Kilkenny	Pil Piltown recurring		12

Kilkenny	Nore Green Street Kilkenny Jan 1995	25/01/1995	12
Kilkenny	Breagagh Circular Rd Kilkenny Oct 2006	26/10/2006	12
Kilkenny	Nore John Street Kilkenny Jan 1995	25/01/1995	10
Kilkenny	Nore Inistioge March 1947	17/03/1947	10
Kilkenny	Nore Breagagh Vicar Street Kilkenny Jan 1995	25/01/1995	6
Kilkenny	Breagagh Kilkenny Blackmills Area recurring		5
Kilkenny	Ballynamountain Bridge recurring		2
Kilkenny	Suir Newrath at Redbridge recurring.		1
Kilkenny	Nore Bateman's Quay Kilkenny Jan 1995	25/01/1995	1
Limerick	Clancy's Strand Harry's Mall Limerick Dec 1999	23/12/1999	60
Leitrim	Leitrim Village, Co. Leitrim, Nov 2009	19/11/2009	17
Leitrim	Carrick-on-Shannon, Co. Leitrim, Nov 2009	19/11/2009	10
Leitrim	Jamestown, Co. Leitrim, Nov 2009	19/11/2009	3
Leitrim	Dromod, Co. Leitrim, Nov 2009	19/11/2009	3
Limerick	Bilboa Mulkear Cappamore Limerick recurring		46
Limerick	Harry's Mall Limerick Feb 1997	10/02/1997	30
Limerick	Shannon Estuary Foynes Feb 2002	01/02/2002	20
Limerick	Clancy's Strand Limerick Feb 2002	11/02/2002	12
Limerick	Athea Co. Limerick Aug 2008	31/07/2008	12
Limerick	Athea Co.Limerick 02/09/2009	02/09/2009	4
Limerick	Corbally St Mary's Pk Limerick Dec 1999	25/12/1999	2
Limerick	Corbally R463 Limerick Dec 1999	25/12/1999	2
Limerick	Meelick Bridge Limerick recurring		2
Limerick	Robertstown Shanagolden Recurring		2
Limerick	Mulkear Lismullane, Ballysimon Limerick Recurring		1
Limerick	Morgan's House, Foynes Turlough Recurring		1
Limerick	Rosstemple Limerick recurring		1
Limerick	Deel Banoke Bridge Recurring		1
Limerick	Shanagolden Recurring		1
Limerick	Killard Redgate Dec 1999	27/12/1999	1
Limerick	Bunkey River Recurring		1
Louth	Baltray, Co. Louth recurring		18
Louth	Annagassan Recurring		10
Louth	Seapoint GC, Co Louth Recurring		3
Louth	Simcock's Lane/Trinity Street Junction Recurring		2
Louth	Proleek 2001		1
Louth	Public House, Market St., Carlingford. Undated		1
Louth	Townrath Recurring		1
Louth	Carstown Recurring		1
Louth	Clarkestown Lane, Termonfeckin (November 2002)	15/11/2002	1
Mayo	Ballynalty Mill Nov 1999	28/11/1999	1
Mayo	Bunowen Chapel St., Louisburg Sep-Dec 1999	01/09/1999	1
Mayo	Clare Ballyhaunis Nov 1999	28/11/1999	1
Mayo	Bellanaboy River Bellanaboy Bridge Sep 1985	21/09/1985	1
Mayo	Bellanaboy River Bellanaboy Bridge Sep 2003	19/09/2003	1
Meath	Tolka Clonee Nov 2000	05/11/2000	62
Meath	Tolka Dunboyne Nov 2000	05/11/2000	62
Meath	Tolka Batterstown Nov 2000	05/11/2000	62
Meath	Mornington February 2002	01/02/2002	30
Meath	Ardsallagh Recurring		1
Meath	Gillstown CR 379/380 Recurring		1
Meath	Dee Nobber Recurring		1
Meath	Moortown Bridge R163 Recurring		1
Meath	Piercetown Black Bull Recurring		1
Meath	Fairyhouse Baltrasna Recurring		1
Meath	Primatestown Recurring		1
Meath	Mattock Wood Mill Bridge Recurring		1
Meath	Ringlestown/Kimessan CR 369 Recurring		1
Meath	North Commons Boreen, Trim Recurring		1
Meath	Phillistown, Trim CR452 Recurring		1

Meath	Ballinabrackey CR5 Recurring		1
Meath	Navangate Street, Trim Recurring		1
Offaly	Kennedy's Cross Roads, Birr Jan 1995	27/01/1995	1
Roscommon	Athleague, Co. Roscommon, Nov 2009	18/11/2009	27
Roscommon	Roscommon Town, Nov 2009	19/11/2009	10
Roscommon	Cortober, Co. Roscommon, Nov 2009	19/11/2009	7
Roscommon	Lisalway, Co. Roscommon, Nov 2009	19/11/2009	2
Roscommon	Milltown, Castleplunkett, Nov 2009	19/11/2009	1
Roscommon	Ballintubber, Co. Roscommon, Nov 2009	19/11/2009	1
Sligo	Drumcliff Ballynagalliagh Bridge Nov 2002	08/11/2002	1
Tipperary	Suir Clonmel Nov 2000	05/11/2000	260
Tipperary	Suir Clonmel Jan 1996	04/01/1996	250
Tipperary	Suir Carrick-on-Suir Nov 2000	06/11/2000	184
Tipperary	Clonmel, Co. Tipperary, Nov 2009	19/11/2009	30
Tipperary	Coolaholliga (North of Nenagh) Recurring		10
Tipperary	Ardfinnan, Co. Tipperary, Nov 2009	19/11/2009	8
Tipperary	Knockavilla, Co. Tipperary, Nov 2009	19/11/2009	8
Tipperary	Tannersrath Clonmel Nov 2000	05/11/2000	7
Tipperary	Kilmastulla Recurring		5
Tipperary	Ballynahow Cross to Bohereenbueen Bridge Recurring		5
Tipperary	Suir Killaloan Upper Nov 2000	05/11/2000	5
Tipperary	Hollyford Recurring		4
Tipperary	Burncourt River Burncourt Nov 2000	05/11/2000	3
Tipperary	Clogheen Village Recurring		2
Tipperary	Glencallaghan Recurring		2
Tipperary	Skeheenaranky Recurring		2
Tipperary	Reddanswalk/Clonmorewalk Recurring		2
Tipperary	Seskin near Clonmel Nov 2000	05/11/2000	2
Tipperary	Clogheen Nov 2000	05/11/2000	2
Tipperary	Fethard Nov 2000	05/11/2000	2
Tipperary	Multeen Clone Bridge Tipperary recurring		1
Tipperary	Drumminnagleagh to Ballyoughter Recurring		1
Tipperary	Ballymurreeen Bridge Littleton Recurring		1
Tipperary	Springfort Cross Undated		1
Tipperary	Scarragh 2004		1
Tipperary	Barry's Bridge Recurring		1
Tipperary	Grange Recurring		1
Tipperary	Renaghmore Recurring		1
Tipperary	Cappagh Recurring		1
Tipperary	Kilenaule to Gortnahoo Road Recurring		1
Tipperary	Cappa New Bridge Tankerstown Recurring		1
Tipperary	Clonmore Tipperary Recurring		1
Tipperary	Brackbaun Bridge May 2000	16/05/2000	1
Tipperary	Cullen Village Recurring		1
Tipperary	Ballynamrossagh Recurring		1
Tipperary	Newtown Tipperary Recurring		1
Tipperary	Gortavoher Recurring		1
Tipperary	Moandoherdagh Recurring		1
Tipperary	Kilcash Nov 2000	06/11/2000	1
Tipperary	Carrickconeen near Clonmel Nov 2000	05/11/2000	1
Tipperary	Suir Ardfinnan Nov 2000	05/11/2000	1
Tipperary	Ballyporeen Nov 2000	05/11/2000	1
Tipperary	Shronell Nov 2000	05/11/2000	1
Tipperary	Limerick Junction Nov 2000	05/11/2000	1
Tipperary	Clonganhue Nov 2000	05/11/2000	1
Waterford	Monyvroe recurring		2
Waterford	Blackwater Cappoquin Boathouse recurring		1
Waterford	Woodstown W71 recurring		1
Waterford	Cheekpoint recurring		1
Waterford	Clodiagh Clonea recurring		1
Waterford	Suir Sir Thomas Br Twomilebridge Nov 2000	06/11/2000	1

Westmeath	Athlone, River Shannon	19/11/2009	75
Westmeath	Al River, Willow Park, Athlone, Nov 2002	10/11/2002	60
Westmeath	Kinnegad, Westmeath, Nov 20099	19/11/2009	2
Westmeath	Gaybrook, Mullingar, Westmeath	19/11/2009	1
Wexford	Bridgetown recurring		5
Wexford	Essex Bridge Barnadown Lower Nov 2000	05/11/2000	4
Wexford	Enniscorthy, Co Wexford, Nov 2009	18/11/2009	2
Wexford	Owenavorragh Killenagh Bridge Nov 2000	05/11/2000	2
Wexford	Polehore recurring		1
Wexford	Curracloe R743 White Gap recurring		1
Wexford	Rosslare Harbour MVD recurring		1
Wexford	Drinagh Slob Road recurring		1
Wexford	Bann Scarawalsh Nov 2000	06/11/2000	1
Wexford	The Still Pond Fairfield Enniscorthy undated		1
Wicklow	Donard Village Undated		3
Wicklow	Chapel Lane, Baltinglass, Co. Wicklow Recurring		2
Wicklow	Aughrim River Coolahullin recurring		1
Wicklow	Barnacleagh Summer 2004		1
Wicklow	Macreddin Aughrim North Recurring		1
Wicklow	Kilcroney Lane Recurring		1
Wicklow	Forge Road Enniskerry Undated		1
Wicklow	Rockview Arklow Oct 2004	26/10/2004	1

C.4 RECORDS OF PAST FLOODS RELATED TO INFRASTRUCTURE

Set out below are the floods related to infrastructure owned by the local authorities, which have been reported by the Local Authorities

County	Location	Type of Event	Date	Damage Caused
Clare	Town of Shannon	Prolonged Rainfall Failure of Pumps	Not yet happened	Town, Airport Flooded
Cork	Water reservoir, Glashboy waterworks, Glanmire	Broken Reservoir outlet pipe - New retaining wall built to retain any future leaks	1991	Flooding to adjacent private houses
Cork	Ballinacurra, Whitegate Road	Blocked culvert - Screen since installed	01/01/2009	Approx 20 houses flooded
Cork	Ballymackeera	Flooding due to overloaded storm drainage	Annually	Approx 8 premises flooded regularly
Cork	Beech Road, Ballincollig	Surcharging of foul sewers	Dec 2009 and Previously	Flooding of 2 No. dwellings and risk to public health
Cork	Church Road, Douglas	Water main Break	Sept 2009, Nov 2009, Sept 2010	Road flooded and impassable to traffic. Several properties damaged. Repeat event
Cork	Douglas Community Park Stream	Flood from deficiency in Urban Storm-water systems	01/11/2009	Flooding of Community Park, Flooding in Shopping Centre Plaza, Potential Flooding of Shopping Centre
Cork	Innishmore, Ballincollig	Break on Cork harbour and City truck water main	01/08/2010	Flooding of Ballincollig Regional Training Centre and Cork County Council tar depot
Cork	L2454 Southern Fruit / Lehenaghmore / Togher Roundabout	Flood from deficiency in Urban Storm-water systems	Oct & Nov 2000; Nov 2002; Aug 2004	Flooding of over 50 dwellings and commercial premises
Cork	L2460/N25 Junction	Flood from deficiency in Capacity of Trash Screen and Urban Storm-water System - Trash screen being monitored	01/11/2009	Flooding of Road / Potential Flooding of Kinsale Road Roundabout
Cork	L2479 The Glen, Glenbrook	Flood from deficiency in Urban Storm-water systems	01/11/2009	Flooding of dwellings, damage to vehicles, Significant debris on Regional Road
Cork	N28/L2454 Ringaskiddy / Hammond Land / Maritme College / Access to Naval Base	Flood from deficiency in Urban Storm-water systems	Feb 1994, Oct 2004	Flooding & Closure of Road and Access to Naval Base / Potential Flooding of Maritime College
Cork	Primrose Hill, Tower, Blarney	Surcharging of foul sewers	Oct 2009 and a number of times previously	Flooding of 2 No. dwellings and risk to public health

Cork	R611 Carrigaline Main St.	Flood from deficiency in Urban Storm-water systems	Oct & Nov 2000, Nov 2002, Oct 2004, Oct 2006, Nov 2009	Road closed - Pub & Shops Flooded
Cork	Ringaskiddy (outside Marine College)	Water main break	Oct 2007, Nov 2008, Apr 2010	Road flooded and impassable to traffic to Marine College and Naval base. Repeat event
Cork	South Main Street, Bandon	Surcharging of sewage network	Regular	Public health risk and damage to properties on Western side of South Main St., Bandon
Dublin City	Baldoyle	Pluvial		Below sea level. Back from the coast by some distance but however it remains at risk.
Dublin City	Pearse Square Creighton Street	Pluvial		c. 12 basements in this area at risk, previously have flooded.
Dublin City	Ranelagh/Rathmines - Swan Place, lansdowne Road	Pluvial		Basement flooding problem here 2003. Frequent pluvial flooding events, Jury Hotel Flooded
Dublin City	Mourne Road near Errigal Road	Pluvial		Road floods a few times a year
Dublin City	62 Parkmore Drive rear,	Pluvial		near Corrib Road, back gardens flooded.
Dublin City	14 Leeson Park Avenue	Pluvial		Road Flooded - garden flooded
Dublin City	Chapelizod, bottom of hill	Pluvial		C. 6 houses flooded , walls overturned
Dublin City	1A Chapelizod Road	Pluvial		2 houses and basements flooded due to snow melt and rain.
Dublin City	Blackhorse Avenue (Park Crescent)	Pluvial		Mostly road flooding, 5 apartments flooded.
Dublin City	Villa Park	Pluvial		
Dublin City	Seafield Road (East/West?)	Pluvial		Road Flooding, gardens flooded
Dublin City	Griffith Avenue generally	Pluvial		There are low lying (bowls) along this road which regularily suffer from flooding.
Dublin City	Hardiman Road	Pluvial		Houses flooded?
Dublin City	Inverness Road, off Philipsburg Avenue	Pluvial		Basements flooded.
Dublin City	Santry Avenue	Pluvial		Road flooding
Dublin City	Pearse Station area (south campshires area)	Pluvial / Fluvial		A few instances of pluvial flooding, but at risk. High proportion of basements here. Schemes to start soon - currently at detail design stage.

Dublin City	Cabra, Glendhu area to Ashington, leix Road Cuala, Road, offaly road	Pluvial / Fluvial		Pluvial flooding, properties flooded regularly. Improvement scheme now on-going.
Dublin City	Martin's Row, Chapelizod	Pluvial / Fluvial		Drainage from Phoenix park, road and properties impacted, flood often. Some works were carried out.
Dublin City	North Strand area, Batview Avenue, Foster Terrace, Portland Place, Jones Road, Clonliffe Road.	Pluvial / Fluvial / GW		Low Lying area, in a bowl, basements regularily flooded
Dublin City	Pearse Street	Pluvial / Tidal		Once a year basements at 151 to 142 and 78, 79 and 76 flood
Dublin City	Gordon Street, Doris and Barrow Street	Pluvial / Tidal		C. 20 houses flood, mainly from passing cars, the wash coming in the doors, area is a bowl
Dublin City	Macken Street	Pluvial / Tidal		Road and Grand Canal Theatre Basement flooded
Dublin City	Areas around Shrewsbury PS and Ailesbury PS	Pluvial / Tidal / Ground water		Stations built in 1960's to prevent flooding. Ailesbury houses built on an old pond / lake
Dublin City	Donnycarney, upper wad, Collins Ave East, Clanmoyle Road, Collins Park, Elm Mount Avenue, Shanrath Road, Swords Road, Shangan Gardens, Crestfield Road	Pluvial Fluvial		River Wad flooded. Study on-going. 91 houses and schools pub and sports centre flooded in 2009 and 2008
Dublin City	Kilmainham	Fluvial / Pluvial		Royal Hospital, Mount Brown, back of properties risk from Camac river. Flooding from the front of the properties from pluvial
Dublin City	Suir Road	Fluvial / Pluvial		South side, houses flooded but mostly due to road flooding and wave caused by passing traffic.
Dublin City	Mount Brown / Old Kilmainham Lane	Fluvial / Pluvial		Low lying areas, houses flooded
Dublin City	Cabra, leix Road Cuala, Road, offaly road, Dingle Road, Drumcliffe Drive, Carnlough Road	Fluvial Pluvial		Pluvial flooding, properties flooded regularly. Improvement scheme now on-going.
Dublin City	Ballygall Crescent, Fairways Green, Griffith Close	Fluvial Pluvial		2008/9, houses flooded. Scheme being designed

Dublin City	Clonliffe Road / Ballybough	Fluvial Pluvial Tidal		Scheme completed. Lower sections close to Clonliffe Road at high risk from pluvial. Low lying therefore storage issue. Propsed to deal with by using mobile high capacity pumps to pump ponded surface water to nearest river channel.
Dublin City	East wall generally, ossary Road, Church Road, Hawthorn Terrace, St Mary's Road, Shamrock Cottages, West Road, East Link Toll Plaza	Tidal, Ground water/ Pluvial		flooded in Feb 2002, Tidal Defence works in Place
Dublin City	Kincora Court, Crab Lake pumping station, Clontarf Laneway off Conquer Hill	Tidal, Groundwater, Pluvial		Protects Kincora Estate Clontarf, marked on map, near bus station.
D.L. Rathdown	Dalkey - Dart Line	Pluvial / Storm-water	10/09/2008	Dart Line Flooded - Trains stopped
D.L. Rathdown	Glastule, Dun Laoghaire	Pluvial / Storm-water	10/09/2008	Flooding to 10 Properties
D.L. Rathdown	Killcross, Sandyford	Flooding of one house arising from nearby burst water main - Localised section of pipe replaced	2002	Fixtures and Fittings
Galway	Loughrea Town	Storm Water System	01/11/2009	3 Houses
Kerry	Ardfert	Surcharged sewers	1-2 years	3 Commercial Premises
Kerry	Ballylongford	Urban Storm-water System - Tide-locking during heavy rainfall event	1997, 2003	15 houses approx
Kerry	Causeways	Undersized pipes		1 house
Kerry	Listowel	Urban Storm-water System - Some mitigation measures implemented	8th Dec 2000	Domestic houses - approx 20 houses
Kerry	Sneem	Heavy rainfall open drain not big enough	2009	
Kerry	Tralee - Ballymullen-Skehanagh	Urban Storm-water System - Tide-locking during heavy rainfall event	2010 Regularly	50 houses
Leitrim	Bridge Street, Carrick-on-Shannon	Rain Storm	2008	Properties, Cars
Leitrim	Near Manorhamilton	Water Mains burst - Minor Impacts		
Limerick	Abbeyfeale, Bridge Street	Storm-water overflows - CSO Issue	Once a year	Houses
Limerick	Ballysimon Road	Pluvial - Monoclinoe Restriction	Winter 2009-10	Road flooding
Limerick	Ballysimon to Crossagela	Storm-water - Study undertaken	Couple of times a year	Road and Industrial area
Limerick	Castletroy, Entrance to University	Storm-water	Several times a year	Road flooded
Limerick	Coonagh Cross, Limerick City	Storm-water - Old culverts		

Limerick	Foynes, Dernish Avenue	Storm-water - Some works undertaken	Once every four or five years	Houses
Limerick	Fr Russell Road, Limerick City	Storm-water		
Limerick	Galbally Village			
Limerick	Mungret, Limerick	Storm-water - Works being applied for	Once a year	Creates an Island
Limerick	N69			
Limerick	Newcastle West	Combined Sewerage Outfall	Couple of times a year	Houses - Minor
Limerick	Newcastle West / Athlea	Storm-water	July / August 2008	House
Limerick	Rossbrien	Storm-water into Culvert / Tidal	Once a year	Houses, Estates
Limerick	Woodvale, Foynes	Water mains Flood - Some pipes replaced	1996 - Dec	Houses flooded
Louth	Some areas of Drogheda	Following heavy rainfall – Storm-water drainage capacity being assessed		
Louth	Sone areas of Dundalk	Large scale rupture on trunk mains – Suspected Risk		Not Assessed
Louth	South Drogheda	Large scale rupture on trunk mains – Suspected Risk		Not Assessed
Mayo	Westport	Surcharge of public sewer due to infiltration of surface water due to heavy rain	July 2010 and 2 other occasions in 2009	Public health issues. No damage to property
Meath	Donore	Large scale rupture on trunk mains – Suspected Risk		Not Assessed
Tipperary South	Clonmel, Mary St.	Urban Storm-water system surcharge	2004	Houses flooded
Tipperary South	Clonmel, Upper Irishtown	Urban Storm-water system surcharge	2004	10 No. houses flooded
Tipperary South	Clonmel, William St., Upper Gladstone St., Bolton St, Queens St.	Urban Storm-water system surcharge	2004	Approx 30 No. Houses and 1 No. Pub
Tipperary South	Clonmel-Heyworth Road / Frank Drohan Road	Water main burst		2. No. houses flooded
Waterford	East Waterford Water Supply Scheme (EWWSS): Kilmeaden Village	Burst Water Mains: 600mm AC - Automated valving since installed to prevent recurrence	01/12/2009	Flooding of roadways and minor flooding of commercial area

(Blank Page)

APPENDIX D

RECEPTOR VULNERABILITES

Risk Category	Sub-Category	Receptor Group	Receptor	Receptor Type	Basic Classification
Social	Human Health	Death, Injury, Stress	Geo-Directory Property Database - Residential Properties	**Point**	Low Vulnerability
	Community	Education	Primary Schools	**Point**	High Vulnerability
			Post Primary Schools	**Point**	High Vulnerability
			Third Level	**Point**	High Vulnerability
		Emergency Services	Fire Stations	**Point**	High Vulnerability
			Garda Stations	**Point**	Moderate Vulnerability
			Civil Defence	**Point**	Moderate Vulnerability
		Governance	OPW / Government Buildings	**Point**	**VARIABLE**
		Health Services	Nursing Homes	**Point**	Extreme Vulnerability
			Hospitals	**Point**	Critical Vulnerability
			Other Health Services (e.g., Health Centres)	**Point**	Moderate Vulnerability
Economic	Business		Geo-Directory Property Database - Commercial Properties	**Point**	Low Vulnerability
	Infrastructure	Power	ESB Power Stations	**Point**	Critical Vulnerability
			ESB HV Substations	**Point**	Extreme Vulnerability
			Bord Gais Assets - Lower Priority	**Point**	Low Vulnerability
			Bord Gais Assets - Higher Priority	**Point**	Moderate Vulnerability
			Bord Gais Assets	**Point**	Moderate Vulnerability
		Water	Water Treatment Plants	**Point**	Moderate Vulnerability
			Wastewater Treatment Plants	**Point**	Moderate Vulnerability
		Telecommunications	Eircom Assets - Non-Core Exchange	**Point**	Low Vulnerability
			Eircom Assets - Core Exchange	**Point**	Moderate Vulnerability
		Ports	Ports and Harbours	**Point**	High Vulnerability
		Airports	Airfields and Aerodromes	**Point**	Moderate Vulnerability
			Airports - National and Regional	**Point**	Extreme Vulnerability
			Airports - International	**Point**	Critical Vulnerability
	Agriculture & Land	Agricultural Land	Agriculutral Land	**Area**	**Areal Assessment**
			Forestry	**Area**	**Areal Assessment**

Risk Category	Sub-Category	Receptor Group	Receptor	Receptor Type	Basic Classification
Cultural Heritage	Cultural Heritage	Built Heritage	Architectural Heritage - Local	**Point**	Low Vulnerability
			Architectural Heritage - Regional	**Point**	Low Vulnerability
			Architectural Heritage - National	**Point**	Moderate Vulnerability
		Museums	Museums and Art Galleries	**Point**	**VARIABLE**
		Archaeological Heritage	National Monuments	**Point**	**VARIABLE**
			UNESCO World Heritage Sites	**Point**	Critical Vulnerability
Environment	Designated Sites	Designated Sites	SAC	**Area**	**VARIABLE**
			SPA	**Area**	**VARIABLE**

APPENDIX E

PREDICTIVE FLOOD RISK ASSESSMENT OUTCOMES

E.1. PREDICTIVE ANALYSIS OUTCOMES FOR FLUVIAL AND COASTAL FLOOD RISK

The locations where the predictive Flood Risk Index is greater than 150 based on fluvial and coastal flooding are set out below. The process for the determination of the Flood Risk Index is described in Section 4.4 of the main body of the report.

County	ID No.	Location	Flood Risk Index
Carlow	140151	Bagenalstown	850
Carlow	120131	Ballykealey	315
Carlow	120133	Bunclody	280
Carlow	140155	Carlow	11467
Carlow	140160	Fenniscourt	160
Carlow	140161	Garryhundon	170
Carlow	140166	Leighlinbridge	815
Carlow	140171	Oldleighlin & Seskin Lowe	365
Carlow	120141	Tullow	774
Cavan	360566	Annagelliff	180
Cavan	360568	Ballyconnell	503
Cavan	360570	Bawnboy	574
Cavan	360571	Blacklion	231
Cavan	360572	Cavan	3655
Cavan	360574	Lough Oughter Islands	225
Cavan	70038	Mullagh	324
Cavan	70044	Virginia	595
Clare	250402	1MON_Inishcaltra	25290
Clare	250405	Annacarriga	251
Clare	250412	Bridgetown	285
Clare	270471	Bunratty	1670
Clare	280484	Carrowmore	846
Clare	270473	Cranny	2520
Clare	280485	Doolin	155
Clare	250423	Drumandoora	270
Clare	270474	Ennis	35174
Clare	270475	Kilkee	1013
Clare	270476	Kilrush	567
Clare	270477	Limerick City	43961
Clare	270478	Lissan West	425
Clare	270479	Newmarget On Fergus	170
Clare	250434	O'Briensbridge	176
Clare	270480	Quinn	224
Clare	250439	Raheen	564
Clare	290491	Scanlans Island & Environ	174
Clare	270481	Shannon	99767
Clare	270482	Sixmilebridge	829
Clare	280486	Spainish Point	190
Cork	180270	Ballyclough	790
Cork	190292	Ballymakeery & Bally	839
Cork	200293	Bandon	3823

Cork	210307	Bantry	3723
Cork	180268	Buttevant	326
Cork	190271	Carrigadrohid	25180
Cork	190289	Carrigaline	768
Cork	180250	Castlelyons	321
Cork	200294	Clonakilty	3896
Cork	190273	Coachford	235
Cork	190286	Cork City	34386
Cork	190278	Curraleigh	27530
Cork	190291	Douglas	485
Cork	200295	Dromore	310
Cork	200296	Dunderrow	220
Cork	200297	Dunmanway	480
Cork	210309	Durrus	419
Cork	180252	Fermoy	4046
Cork	180253	Freemount	755
Cork	190290	Glanmire	162
Cork	190285	Glanmire North (Sall	654
Cork	190268	Inchigeelagh	250
Cork	200298	Inishannon	537
Cork	180254	Kanturk	1100
Cork	210311	Kealkill	191
Cork	210313	Kilcrohane	848
Cork	180256	Killavullen	573
Cork	190274	Killeagh	316
Cork	190287	Kilnaglery (SE Carri	320
Cork	200299	Kinsale	214
Cork	190275	Ladysbridge	173
Cork	180259	Liscarroll	151
Cork	190284	Little Island	507
Cork	180261	Lougheagle	150
Cork	190270	Macroom	777
Cork	180262	Mallow	1980
Cork	190279	Middleton & Ballynac	2875
Cork	190281	Midleton North (Broo	259
Cork	180269	Millford Bridge	270
Cork	200300	Minane Bridge	273
Cork	180263	Mitchelstown	480
Cork	190276	Mogeely	388
Cork	180264	New Twopothouse Village	190
Cork	190283	Passage West	200
Cork	180265	Rathcormack	751
Cork	230360	Rockchapel	160
Cork	200301	Ross Carbery	427
Cork	210314	Rossmore	160
Cork	200302	Skibbereen	1004
Cork	200303	Skull	660
Cork	190269	Teergay	162
Cork	190288	Togher	1623
Cork	190280	Tower	154
Cork	190282	Whitegate	199
Cork	190272	Youghal South (Clayc	181
Cork	190277		686
Donegal	360565	1ESB_Cloghore	2500
Donegal	380590	38_Carrickart Uplands_100	190
Donegal	10001	Altnapaste	171
Donegal	380591	Annagary	199
Donegal	380592	Ardara	424

Donegal	10002	Ballybofey	3476
Donegal	390598	Ballymaleel	340
Donegal	380598	Ballymore Lower	154
Donegal	360569	Ballyshannon	61040
Donegal	390599	Bridge End	259
Donegal	390600	Buncrana	2418
Donegal	390601	Burnfoot	551
Donegal	400616	Carndonagh	2115
Donegal	380593	Carrowcannon	170
Donegal	380594	Carrowkeel_100713	270
Donegal	10003	Castlefinn	274
Donegal	390602	Castlequarter	200
Donegal	10004	Churchtown	150
Donegal	400617	Clonmany	407
Donegal	10005	Convoy	567
Donegal	370580	Donegal	384
Donegal	380595	Downies	479
Donegal	390603	Drumgohill	300
Donegal	380596	Dunfanaghy	704
Donegal	370582	Frosses	150
Donegal	10006	Glencovet	151
Donegal	380597	Glenties	362
Donegal	370583	Inver	202
Donegal	370584	Kilcar	150
Donegal	370585	Killybegs	717
Donegal	10007	Killygordon	492
Donegal	390606	Kilmacrenan	280
Donegal	370586	Laghy	183
Donegal	390607	Letterkenny	7058
Donegal	10008	Lifford	160
Donegal	400620	Malin	529
Donegal	390609	Millford	160
Donegal	400621	Moville	444
Donegal	400622	Muff	260
Donegal	390610	Newtown Cunningham	531
Donegal	370587	Rathinny Near Ballintra	460
Donegal	390611	Rathmelton	251
Donegal	390613	Rathmullan	500
Donegal	390614	Speenogue	290
Donegal	350563	Tullaghan	296
Dublin	90067	1ESB_Blackrock	343
Dublin	80046	1NUR_Balrothery	2730
Dublin	80047	1NUR_Luttrells	2520
Dublin	80048	1NUR_Murragh	2520
Dublin	80050	1SCH_Rowlestown	330
Dublin	90070	Adamstown	1056
Dublin	80053	Balbriggan	4171
Dublin	90071	Balgriffin	330
Dublin	90072	Belcamp Park	340
Dublin	100114	Bray	4680
Dublin	90081	Clontarf	769
Dublin	80055	Donabate	166
Dublin	90082	Dublin City	604134
Dublin	90084	Finglas, Glasnevin	3670
Dublin	90088	Kinsaley	520
Dublin	100121	Loughlinstown	4660
Dublin	90090	Lucan To Chapelizod	10424
Dublin	80057	Lusk	300

Dublin	90091	Malahide	501
Dublin	90093	Mulhuddart	2152
Dublin	80058	Oldtown	320
Dublin	80059	Portrane	434
Dublin	90096	Raheny	2662
Dublin	90097	Rathcoole, Saggart & Bald	7251
Dublin	80061	Rush	1204
Dublin	90099	Santry	1060
Dublin	90100	Santry Demesne	2990
Dublin	80062	Skerries	354
Dublin	80063	Staffordstown Turvey	280
Dublin	90102	Sutton & Baldoyle	3484
Dublin	90103	Sutton & Howth North	327
Dublin	80064	Swords	3030
Dublin	90104	Swords (South)	3971
Dublin	80066	Warbletown	150
Galway	300492	1ESB_Ballygaddy	363
Galway	300493	1MON_Inchagoill	160
Galway	250399	Abbey	291
Galway	310513	An Chathair	187
Galway	310514	An Cheathru Rua (Carraroe	337
Galway	260451	Ballinasloe	315
Galway	250409	Banagher	408
Galway	310515	Bearna	300
Galway	310516	Both Chunna Thiar	330
Galway	300497	Claregalway	4367
Galway	290493	Clarinbridge	472
Galway	320523	Clifden	200
Galway	300499	Corrofin	595
Galway	290494	Doorus Demesne	343
Galway	300501	Dunmore	185
Galway	300502	Galway City	10169
Galway	300503	Headford	695
Galway	300504	Inchiquin	250
Galway	300505	Inishmicatreer	270
Galway	260463	Kilconnell	150
Galway	290487	Kinvarra	228
Galway	290488	Knockakilleen & Environs	283
Galway	300507	Knocknacarra	3924
Galway	310517	Knocknacarra_Rusheen Bay	241
Galway	300511	Lackagh More	152
Galway	290489	Loughrea	643
Galway	300512	Montiagh South	197
Galway	310518	Na Forbacha	714
Galway	310519	Na Haille	470
Galway	290490	Oranmore	1774
Galway	300508	Oughterard	667
Galway	250437	Portumna	504
Galway	300509	Rosscahill	200
Galway	290492	Stradbally South	180
Galway	300510	Tuam	1757
Kerry	210305	1MON_Church Island	410
Kerry	220316	1MON_Innisfallen Abbey	160
Kerry	230341	Abbeydorney	3426
Kerry	230342	Aughacasla	552
Kerry	230343	Ballyduff	155
Kerry	220317	Ballyfinnane	160
Kerry	230344	Ballyheige	887

Kerry	240370	Ballylongford	367
Kerry	230345	Banna	1093
Kerry	220318	Barraduff	210
Kerry	220320	Boolteens	410
Kerry	220322	Callanafersy East	179
Kerry	230346	Carhoonaknock	290
Kerry	230363	Carrigaha	381
Kerry	220323	Castleisland	6186
Kerry	220324	Castlemaine	332
Kerry	230347	Cloonprohus	382
Kerry	220325	Coolroe Lower	310
Kerry	220326	Cordal	933
Kerry	230348	Derrymore	175
Kerry	230349	Derryquay	252
Kerry	220327	Dingle	1282
Kerry	220328	Doonimlaghbeg	170
Kerry	230350	Dromclough	1330
Kerry	230351	Dromroe	343
Kerry	220329	Faha West	310
Kerry	220330	Farranfore	3455
Kerry	220331	Fieries	270
Kerry	230353	Foildarrig	180
Kerry	220332	Garrane West	217
Kerry	230354	Garrynagore	542
Kerry	220333	Glenbeigh	373
Kerry	210310	Gortamullin	180
Kerry	220334	Gortatlea	212
Kerry	220335	Gortnacarriga	2750
Kerry	220341	Gortnalough	180
Kerry	210312	Kenmare	1065
Kerry	230364	Kilfeighny North	157
Kerry	220337	Killarney	9187
Kerry	220338	Killorglin	1571
Kerry	180258	Knocknaloman	280
Kerry	230355	Liscullan	174
Kerry	230356	Lisselton	1596
Kerry	230357	Listowel	1117
Kerry	230358	Lixnaw	238
Kerry	220339	Milltown	3123
Kerry	230359	Moher	344
Kerry	220340	Portmagee	576
Kerry	240398	Tarbert	153
Kerry	210315	Templenoe	345
Kerry	230361	Tralee	49376
Kerry	230362	Tullig	321
Kildare	90068	1POWER_Longstone	25000
Kildare	140147	Allenwood	922
Kildare	140148	Allenwood South	190
Kildare	140149	Ashgrove	170
Kildare	140150	Athy	7113
Kildare	90073	Blacktrench	270
Kildare	140153	Blackwood	260
Kildare	90075	Carragh	152
Kildare	140156	Castledermot	1563
Kildare	90076	Celbridge	5654
Kildare	90078	Clane	6412
Kildare	90080	Clonfert South	310
Kildare	70032	Coologmartin	230

Kildare	90086	Johnstown (NE Naas)	1890
Kildare	90087	Kill	255
Kildare	90089	Leixlip	27157
Kildare	90092	Maynooth	2300
Kildare	140169	Mullane Cross Roads	230
Kildare	90094	Naas	3364
Kildare	90095	Newbridge	2110
Kildare	140170	Old River Bridge	394
Kildare	140172	Palatine	231
Kildare	140175	Rathangan	859
Kildare	90098	Rathmore	150
Kildare	90101	Straffan	154
Kildare	140178	Suncroft	315
Kildare	90105	Turnings	463
Kilkenny	150181	Ballyhale	248
Kilkenny	150182	Ballyragget	304
Kilkenny	150185	Callan	209
Kilkenny	150187	Castleblunden	165
Kilkenny	150188	Castlecomer	183
Kilkenny	150190	Freshford	8192
Kilkenny	150191	Glenmore	200
Kilkenny	140162	Graiguenamanagh	1271
Kilkenny	150192	Inistioge	587
Kilkenny	150204	Kells	291
Kilkenny	150194	Kilkenny - Nore	2840
Kilkenny	150195	Kilkenny-Breagagh	246
Kilkenny	150197	Kylenaskeagh	180
Kilkenny	150205	Moatpark	300
Kilkenny	160232	Mullinavat	402
Kilkenny	160234	Owning	840
Kilkenny	160235	Piltown	299
Kilkenny	160237	Strangsmill	320
Kilkenny	150201	Thomastown	793
Kilkenny	150202	Threecastles	320
Kilkenny	150203	Tullaroan	210
Kilkenny	160242	Waterford	16793
Laois	150183	Ballyroan	1460
Laois	140152	Barnashrone	260
Laois	150184	Bowe's Cross Roads	260
Laois	140154	Camcloon	241
Laois	150186	Camross	340
Laois	250416	Castlecuffe	150
Laois	140157	Clogrenan Bridge	164
Laois	140158	Clonaheen	201
Laois	250420	Clonshee	935
Laois	140164	Killeen	198
Laois	140165	Killeshin	500
Laois	140180	Kilvahan	210
Laois	140167	Monasterevin	1446
Laois	140168	Mountmellick	7951
Laois	150198	Mountrath	342
Laois	150199	Oldtown	450
Laois	140173	Portarlingtion	1960
Laois	140174	Portlaoise	10581
Laois	150200	Rathdowney	660
Laois	140176	Ratheven & Ballyroan	848
Laois	140177	Stradbally	184
Laois	140179	Timahoe	262

Leitrim	360567	Ballinamore	1100
Leitrim	350546	Ballymore	180
Leitrim	260455	Carrickonshannon	1435
Leitrim	260459	Drumshanbo	506
Leitrim	350556	Largydonnell	270
Leitrim	350557	Manorhamilton	412
Leitrim	260466	Mohill	720
Leitrim	350562	Sraud	231
Limerick	250404	Abington	191
Limerick	240364	Adare	2453
Limerick	240365	Askeaton	1034
Limerick	240367	Ballinlongig/Dromcolliher	751
Limerick	240368	Ballydaly	152
Limerick	240369	Ballyfooken	161
Limerick	240371	Boherygeela	173
Limerick	240372	Breesheen	797
Limerick	250413	Caherconlish	1320
Limerick	240373	Camas	182
Limerick	250415	Cappamore	769
Limerick	250417	Castletroy	4417
Limerick	240376	Charleville1	705
Limerick	240377	Clarina	3275
Limerick	240378	Coarliss	150
Limerick	240379	Coolygorman	160
Limerick	240380	Croagh	160
Limerick	240381	Croom	835
Limerick	240382	Feohanagh	250
Limerick	240383	Foynes	5632
Limerick	160220	Galbally	1185
Limerick	250424	Garryglass	876
Limerick	240399	Gotoon	220
Limerick	240384	Hospital	172
Limerick	180255	Kilbeheny	542
Limerick	240385	Kildimo New	1457
Limerick	240386	Killacolla	2520
Limerick	240387	Killaghteen	350
Limerick	240388	Kilmallock	603
Limerick	160228	Lyre	172
Limerick	240389	Michelstowndown	2933
Limerick	240390	Monaster	235
Limerick	240391	Mountcoote	396
Limerick	240392	Newcastle West	4781
Limerick	250435	Pallas Green New	330
Limerick	240393	Patrickswell	276
Limerick	240394	Rathkeale	2372
Limerick	240395	Shanagolden	170
Limerick	240396	Strand	311
Limerick	240397	Tankardstown	230
Longford	260444	1ESB_Lanesbrough	2654
Longford	260446	Abbeyshrule	402
Longford	260447	Aghaboy	470
Longford	260473	Ballinalee	150
Longford	260453	Ballymahon	200
Longford	260457	Drumlish	150
Longford	260460	Edgeworthstown	638
Longford	260462	Inchcleraun	150
Longford	260464	Longford	1743
Louth	60013	Annagassan	517

Louth	60014	Ardee	2418
Louth	60015	Blackrock South	252
Louth	60016	Carlingford & Greenore	2889
Louth	70033	Drogheda	6593
Louth	60019	Dundalk	52831
Louth	60020	Inishkeen	203
Louth	60022	Milltown, Near Termonfeck	150
Louth	60023	Rathcor, Cooley	150
Louth	60024	Termonfeckin	342
Louth	70043	Tullyallen	372
Mayo	340531	1SCH_Carha	270
Mayo	300494	1SCH_Clogher	300
Mayo	320522	1SCH_Cloondaff	280
Mayo	340532	1SCH_Kildaree	293
Mayo	340546	Abbeylands	300
Mayo	340533	Balla	200
Mayo	340534	Ballina & Environs	5931
Mayo	999999	Ballina & Environs	421
Mayo	300495	Ballinrobe	1254
Mayo	300496	Ballyhaunis	467
Mayo	340535	Ballynasrahy & Environs	420
Mayo	340537	Bunnyconnellan	300
Mayo	340538	Castlebar	3485
Mayo	340540	Corroy	160
Mayo	340541	Crossmolina	178
Mayo	300500	Derrindaffderg	166
Mayo	340542	Foxford	3069
Mayo	300506	Kilmaine	150
Mayo	320526	Louisburgh	287
Mayo	340543	Swinford	1005
Mayo	320527	Westport	1617
Mayo	320528	Westport Bay	342
Mayo	320529	Westport Quay	914
Meath	70025	1ESB_Grangeageeth	2550
Meath	70026	1ESB_Randalstown	2500
Meath	80049	1SCH_Kilbride	265
Meath	80052	Ashbourne	474
Meath	70028	Athboy	293
Meath	70029	Ballivor	940
Meath	70031	Bettystown	4834
Meath	90079	Clonee	295
Meath	60018	Coole Bog, Ardee	192
Meath	80054	Coolquoy	164
Meath	80056	Duleek	3241
Meath	90083	Dunboyne	2584
Meath	80067	Gormanston	170
Meath	70035	Johnstown Bridge	390
Meath	70036	Kildalkey	157
Meath	60021	Kilmainhamwood	160
Meath	70037	Kilmessan	405
Meath	260465	Millbrook	160
Meath	70039	Navan	3670
Meath	80060	Ratoath	2384
Meath	70041	Trim	653
Meath	70045	Wilkinstown	221
Monaghan	30009	Bellanode Northeast	156
Monaghan	60017	Carrickmacross	702
Monaghan	30010	Drumgoole	280

Monaghan	30013	Drumhirk	151
Monaghan	360573	Laragh	150
Monaghan	30011	Monaghan	1615
Monaghan	360575	Mullanacloy	270
Monaghan	360576	Scotshouse	190
Monaghan	360577	Smithborough	220
Monaghan	30012	Three Mile House	160
Offaly	250400	1ESB_Shannonbridge	716
Offaly	250403	1SCH_Limcloon	360
Offaly	250410	Birr	4754
Offaly	250418	Clara	585
Offaly	250421	Crinkill	220
Offaly	140159	Daingean	2126
Offaly	250429	Lisdermot	190
Offaly	250430	Mucklagh	350
Offaly	250436	Pollagh	343
Offaly	250438	Rahan	387
Offaly	250441	Timeighter	171
Offaly	250443	Tullamore	20256
Roscommon	260445	1MON_Lough Gara	1556
Roscommon	260472	Athleague	155
Roscommon	260450	Ballaghaderreen 2 Of 2	280
Roscommon	260454	Boyle	1018
Roscommon	260474	Cashelsharkett	280
Roscommon	260456	Castlerea	551
Roscommon	300498	Cloonfad	178
Roscommon	260471	Cootehall	182
Roscommon	260458	Drumlosh	170
Roscommon	260461	Elphin	200
Roscommon	260470	Portnacrinnaght	153
Roscommon	260467	Roosky	230
Roscommon	260468	Roscommon	1583
Sligo	350545	1SCH_Sooey	280
Sligo	350565	Ballygilcash	156
Sligo	350547	Ballymote	1160
Sligo	350548	Ballysadare&Environs	581
Sligo	340539	Charlestown	1302
Sligo	350549	Collooney	641
Sligo	350550	Coolaney	303
Sligo	350551	Drumard	630
Sligo	350552	Drumcliff & Carney	1061
Sligo	350553	Finned	184
Sligo	350554	Gorteen	660
Sligo	350555	Grange	904
Sligo	350558	Rathbraghan_Sligo Town	514
Sligo	350559	Riverstown	276
Sligo	350561	Sligo Town	5824
Sligo	340544	Tobercurry	710
Sligo	350564	Willowbrock & Environs	288
Tipperary	150180	1NUR_Curragunneen Bridge	2510
Tipperary	160204	1NUR_Dundrum_Boherboy	2540
Tipperary	160205	Ardfinnan	169
Tipperary	160206	Ballinaclogh	420
Tipperary	250406	Ballycommon & Ballyartell	151
Tipperary	250407	Ballymackeogh	198
Tipperary	160207	Ballypatrick	220
Tipperary	160208	Ballyporeen	151
Tipperary	250408	Ballyvaughan	190

Tipperary	160209	Bansha	157
Tipperary	250411	Borrisokane	406
Tipperary	160210	Borrisoleigh	782
Tipperary	160211	Caher	680
Tipperary	250414	Cappagh White	210
Tipperary	160212	Carrick-On-Suir	2578
Tipperary	250445	Castlelough	152
Tipperary	160213	Clogheen	28286
Tipperary	250419	Cloghjordan	150
Tipperary	160214	Clondarby	252
Tipperary	160215	Cloneen	190
Tipperary	160216	Clonmel	13423
Tipperary	160217	Clonmore South	280
Tipperary	250447	Cunnahurt	300
Tipperary	160218	Curraghadobbin	233
Tipperary	150189	Derrymore-Roscrea	150
Tipperary	250422	Dolia	420
Tipperary	250446	Dromineer	281
Tipperary	240400	Drumcomoge	160
Tipperary	160219	Fethard	358
Tipperary	160221	Golden	216
Tipperary	160222	Goldings Cross	211
Tipperary	160223	Gortacullin	200
Tipperary	250444	Greenhills	190
Tipperary	160224	Hollyford	460
Tipperary	150193	Islands - Kings River	150
Tipperary	160225	Kilfithmone	170
Tipperary	250427	Killaloe	2167
Tipperary	160226	Killurney	180
Tipperary	160227	Knockbrit	201
Tipperary	150196	Knockulty	170
Tipperary	250428	Limerick Junction	241
Tipperary	160229	Mackanagh	150
Tipperary	160230	Marlfield	277
Tipperary	160231	Mullinahone	257
Tipperary	250432	Nenagh	7450
Tipperary	160233	Newcastle West	283
Tipperary	250433	Newport	337
Tipperary	160236	Rathkea	840
Tipperary	250440	Roscrea	1073
Tipperary	160238	Templemore	612
Tipperary	260469	Terryglass	260
Tipperary	160239	Thurles	807
Tipperary	160240	Tipperary Town	299
Tipperary	250442	Toomyvara	163
Waterford	180247	Aglish	355
Waterford	180248	Ballyduff	618
Waterford	170243	Ballynacourty	236
Waterford	180249	Cappoquin	179
Waterford	180251	Clashmore	191
Waterford	170244	Dungarvan	1627
Waterford	170245	Dunmore East	415
Waterford	180257	Kilmolash	220
Waterford	180260	Lismore	165
Waterford	170246	Ringphuca	500
Waterford	180266	Tallow	493
Waterford	180267	Youghal	1542
Westmeath	70027	1SCH_Milltownpass	291

Westmeath	260448	Athlone	8141
Westmeath	70034	Earlsmeadow	220
Westmeath	250425	Incacrone	152
Westmeath	250426	Kilbeggan	808
Westmeath	250431	Mullingar	590
Wexford	120129	Ballaghkeen	180
Wexford	120130	Ballyhire - St Helens	760
Wexford	110125	Blackwater	240
Wexford	130143	Bridgetown	277
Wexford	120134	Carricklawn-Wexford	170
Wexford	120135	Clonard	310
Wexford	110126	Courtown	771
Wexford	120136	Craanford	150
Wexford	120143	Curracloe	279
Wexford	130144	Duncormick	194
Wexford	120137	Enniscorthy	2783
Wexford	120138	Fairfield & Cherryorchard	561
Wexford	110128	Fortchester Lower	150
Wexford	130145	Foulkesmill	160
Wexford	110127	Gorey	1154
Wexford	120139	Hodgesmill	210
Wexford	120140	Kellystown	177
Wexford	130146	Kilmore	4447
Wexford	120144	Rosslare	417
Wexford	120142	Wexford	5551
Wicklow	100106	1ESB_Shelton Abbey	2587
Wicklow	120128	1ESB_Shillelagh	2593
Wicklow	100107	1MON_Glendalough	753
Wicklow	90069	1POWER_Pollaphuca	25000
Wicklow	100108	Annacurragh	630
Wicklow	100109	Arklow	3454
Wicklow	100110	Ashford & Rathnew	1442
Wicklow	100111	Aughrim	466
Wicklow	100112	Avoca	413
Wicklow	100113	Balliaclash	161
Wicklow	120132	Baltinglass	1069
Wicklow	90074	Blessington	1220
Wicklow	100116	Enniskerry	380
Wicklow	140163	Grange Con	170
Wicklow	100117	Greystones/Charlesland	1180
Wicklow	90085	Hollywood	471
Wicklow	100118	Kilcoole	3406
Wicklow	100119	Killiskey	152
Wicklow	100120	Kilmacanoge	160
Wicklow	100122	Newcastle	586
Wicklow	100123	Rathdrum	197
Wicklow	100124	Wicklow	824

(Blank Page)

E.2. PREDICTIVE ANALYSIS OUTCOMES FOR GROUNDWATER FLOOD RISK

The locations where the predictive Flood Risk Index is greater than 50 based on groundwater flooding are set out below. The process for the determination of the Flood Risk Index is described in Section 4.4 of the main body of the report.

County	Location	Flood Risk Index	Comment
Galway	Galway City and Suburbs	1734	
Galway	Kilcornan/Rohvehagh	401	Health Service at Risk
Galway	Derryfrench	328	Utility at Risk
Galway	Moneyteige/Cahercrin	114	
Galway	Bredagh/Balrobuck Beg	110	
Clare	Kilmacduagh	105	Monuments at Risk
Galway	Tonroe (Ed Clarinbridge)	62	
Galway	Turloughrevagh	60	
Galway	Ringeelaun	53	

(Blank Page)

E.3. PREDICTIVE ANALYSIS OUTCOMES FOR PLUVIAL FLOOD RISK

The locations where the predictive Flood Risk Index is greater than 150 based on pluvial flooding are set out below. The process for the determination of the Flood Risk Index is described in Section 4.4 of the main body of the report.

County	Location	Flood Risk Index	Comment
Clare	Ennistimon	2508	Health service at risk, with limited other risk
Cork	Bishopstown West	174	
Cork	Carrigtohill	205	
Cork	Castletown Bearhaven	453	
Cork	Classes	253	Utility asset at risk, with limited other risk
Cork	Cork City	2418	
Cork	Cork City West	333	
Cork	Kildorrery	503	Health service at risk, with limited other risk
Cork	Kinsale	215	
Cork	Little Island	250	Utility asset at risk, with limited other risk
Cork	Shanakill lower	258	Utility asset at risk, with limited other risk
Dublin	Carrickmines	633	
Dublin	Clontarf	247	
Dublin	Donaghmede	151	
Dublin	Dublin City	11735	
Dublin	Dunsink Observatory	251	Utility asset at risk, with limited other risk
Dublin	Killiney	818	
Dublin	Loughlinstown	155	
Dublin	Northwest Dublin	805	
Dublin	Rush	151	
Dublin	South Dublin	1481	
Dublin	Sutton	504	
Dublin	Tallaght	1295	
Galway	Derryfrench	834	Utility asset at risk, with limited other risk
Galway	Doughiska	209	
Galway	Galway City	278	
Galway	Peak	256	Health service at risk, with limited other risk
Kerry	Killarney	155	
Kerry	Trienearagh	833	Utility asset at risk, with limited other risk
Kildare	Clane	348	Health service at risk, with limited other risk
Kildare	East Naas	251	Utility asset at risk, with limited other risk
Kildare	Maynooth	181	
Kildare	Naas/Sallins	661	
Kilkenny	Kilkenny - Nore	261	
Leitrim	Manorhamilton	843	Health service at risk, with limited other risk
Limerick	Limerick City	266	
Limerick	Limerick City SW	234	
Longford	Longford	179	
Louth	Drogheda	168	
Louth	Grange	853	Utility asset at risk, with limited other risk
Meath	Mountainpole	835	Utility asset at risk, with limited other risk
Offaly	Coolcor	250	Utility asset at risk, with limited other risk
Roscommon	Roscommon East	268	Health service at risk, with limited other risk
Tipperary	Caher	332	Health service at risk, with limited other risk
Waterford	Waterford City	381	
Wicklow	Bray South	310	

(Blank Page)

E.4. PREDICTIVE ANALYSIS OUTCOMES FOR ENVIRONMENTALLY DESIGNATED SITES

The process for the determination of the Flood Risk Index is described in Section 4.4 of the main body of the report.

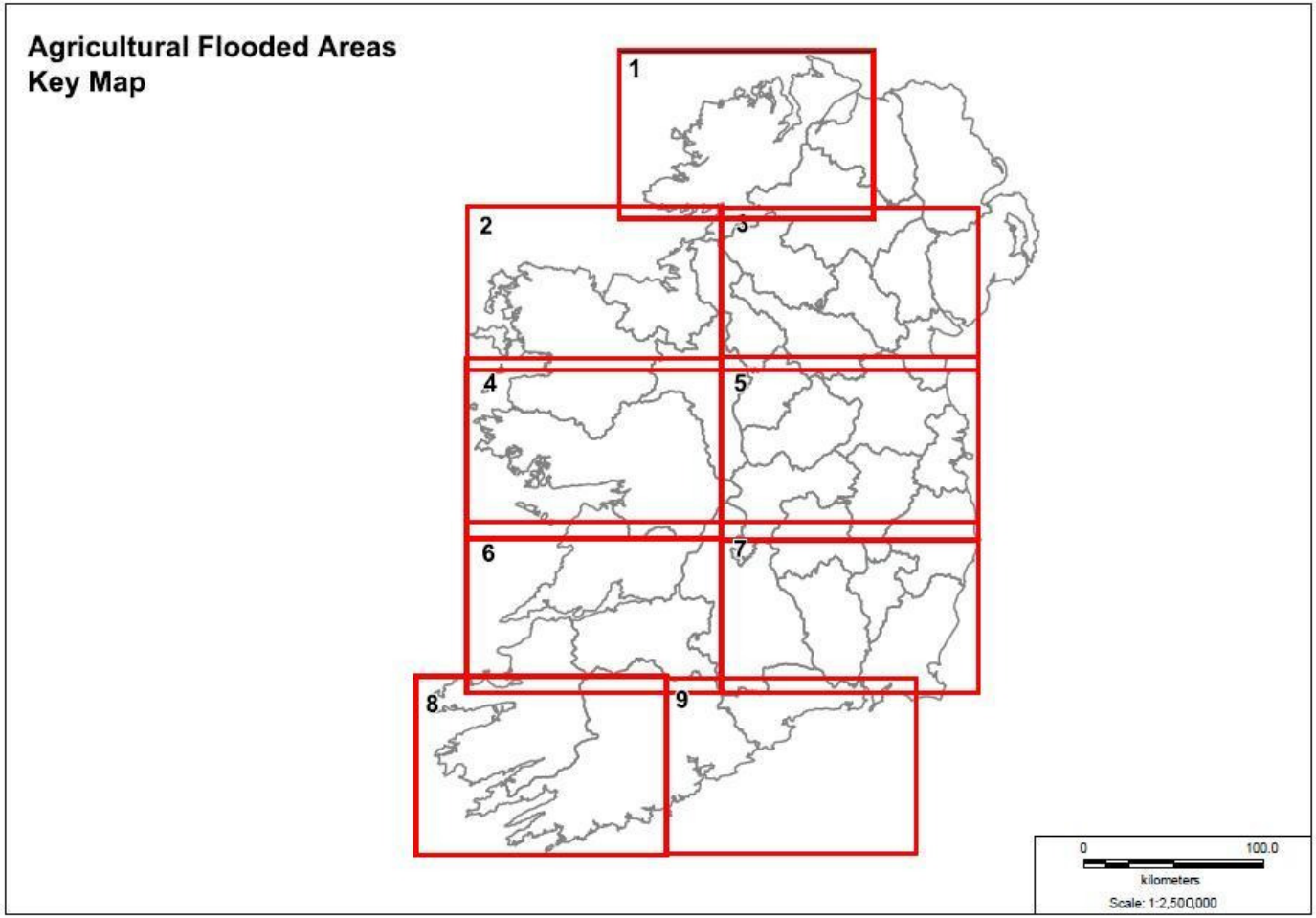
Site Code	Site Name	Designation	Flood Risk Index	Extreme Vulnerability Species	High Vulnerability Species
335	Ballinskelligs Bay And Inny Estuary	SAC	830.4	Petalwort	
2246	Ballycullinan, Old Domestic Building	SAC	281.1	Lesser horseshoe bat	
1975	Ballyhoorisky Point To Fanad Head	SAC	190.5	Narrow-mouthed whorl snail	
1090	Ballyness Bay	SAC	745.4	Geyer's whorl snail	Fixed coastal dunes with herbaceous vegetation (grey dunes)
622	Ballysadare Bay	SAC	1450.3	Narrow-mouthed whorl snail	Fixed coastal dunes with herbaceous vegetation (grey dunes)
2170	Blackwater River (Cork/Waterford)	SAC	1092.3	Taxus baccata woods of the British Isles	Freshwater pearl mussel
625	Bunduff Lough And Machair / Trawalua/Mulla	SAC	281.2	Petalwort	Fixed coastal dunes with herbaceous vegetation (grey dunes)
597	Carrowbehy/Caher Bog	SAC	159.8	Marsh Fritillary	
2250	Carrowmore Dunes	SAC	1139.4	Narrow-mouthed whorl snail	Fixed coastal dunes with herbaceous vegetation (grey dunes)
343	Castlemaine Harbour	SAC	1020.7	Petalwort	Fixed coastal dunes with herbaceous vegetation (grey dunes)
1482	Clew Bay Complex	SAC	388.3	Geyer's whorl snail	
859	Clonaslee Eskers And Derry Bog	SAC	158.9	Geyer's whorl snail	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites)
627	Cummeen Strand / Drumcliff Bay (Sligo Bay)	SAC	438.0	Narrow-mouthed whorl snail	Juniperus communis formations on heaths or calcareous grasslands
30	Danes Hole, Poulnalecka	SAC	517.1	Lesser horseshoe bat	Old sessile oak woods with Ilex and Blechnum in British Isles

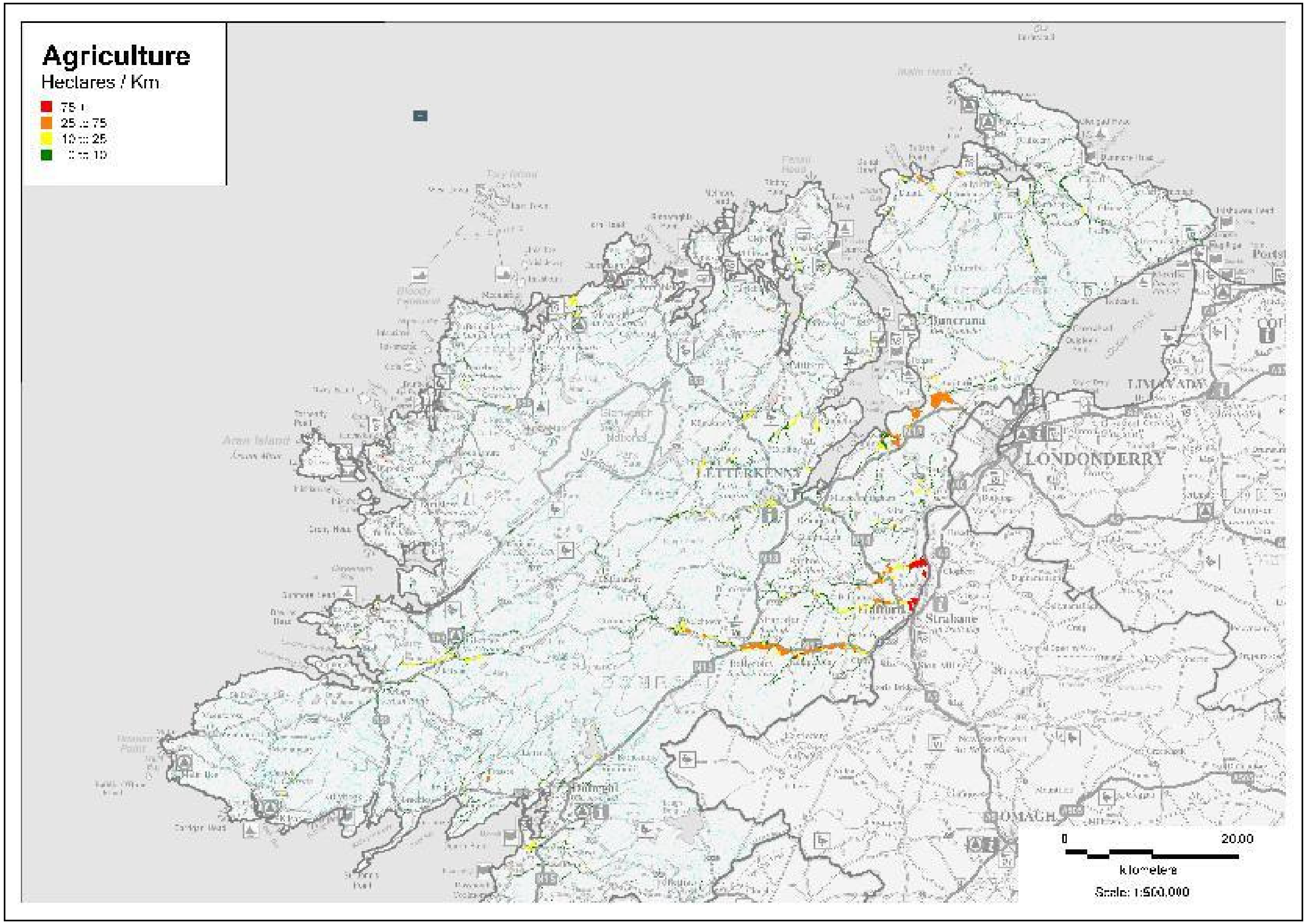
32	Dromore Woods And Loughs	SAC	297.5	Lesser horseshoe bat	Limestone pavements
2315	Glanlough Woods	SAC	272.5	Lesser horseshoe bat	
90	Glengarriff Harbour And Woodland	SAC	243.8	Lesser horseshoe bat	Old sessile oak woods with Ilex and Blechnum in British Isles
1141	Gweedore Bay And Islands	SAC	243.7	Petalwort	Dunes
36	Inagh River Estuary	SAC	188.0		Fixed coastal dunes with herbaceous vegetation (grey dunes)
364	Kilgarvan Ice House	SAC	220.3	Lesser horseshoe bat	
458	Killala Bay / Moy Estuary	SAC	319.0	Narrow-mouthed whorl snail	Fixed coastal dunes with herbaceous vegetation (grey dunes)
4069	Lambay Island SPA	SPA	422.3	Herring Gull	Cormorant, Lesser Black-backed Gull
2147	Lisduff Fen	SAC	951.2	Geyer's whorl snail	
297	Lough Corrib	SAC	307.6	Lesser horseshoe bat	Limestone pavements
2137	Lower River Suir	SAC	1304.5	Taxus baccata woods of the British Isles	Old sessile oak woods with Ilex and Blechnum in British Isles
4096	Middle Shannon Callows SPA	SPA	999.9	Corncrake	
57	Moyree River System	SAC	239.7	Lesser horseshoe bat	Limestone pavements
470	Mullet / Blacksod Bay Complex	SAC	285.6	Petalwort	Atlantic decalcified fixed dunes (Calluno-Ulicetea)
2129	Murvey Machair	SAC	220.9	Petalwort	
206	North Dublin Bay	SAC	1120.3	Petalwort	Fixed coastal dunes with herbaceous vegetation (grey dunes)
353	Old Domestic Building, Dromore Wood	SAC	1607.1	Lesser horseshoe bat	
2314	Old Domestic Buildings, Rylane	SAC	605.8	Lesser horseshoe bat	
396	Pollardstown Fen	SAC	1067.4	Narrow-mouthed whorl snail	Desmoulin's Whorl Snail
2316	Ratty River Cave	SAC	1719.6	Lesser horseshoe bat	

216	River Shannon Callows	SAC	199.3		Limestone pavements
208	Rogerstown Estuary	SAC	165.7		Fixed coastal dunes with herbaceous vegetation (grey dunes)
1398	Rye Water Valley / Carton	SAC	1092.2	Narrow-mouthed whorl snail	Desmoulin's Whorl Snail
2074	Slyne Head Peninsula	SAC	154.6	Petalwort	Juniperus communis formations on heaths or calcareous grasslands, Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites)
1680	Streedagh Point Dunes	SAC	556.6	Narrow-mouthed whorl snail	Fixed coastal dunes with herbaceous vegetation (grey dunes)
4093	Termoncarragh Lake And Annagh Machair SP	SPA	1334.0	Corncrake	Dunlin, Lapwing, Snipe
2247	Toonagh Estate	SAC	196.2	Lesser horseshoe bat	
4073	Tory Island SPA	SPA	1457.8	Corncrake	
2179	Towerhill House	SAC	1201.2	Lesser horseshoe bat	
2070	Tralee Bay And Magharees Peninsula, West	SAC	1180.4	Petalwort	

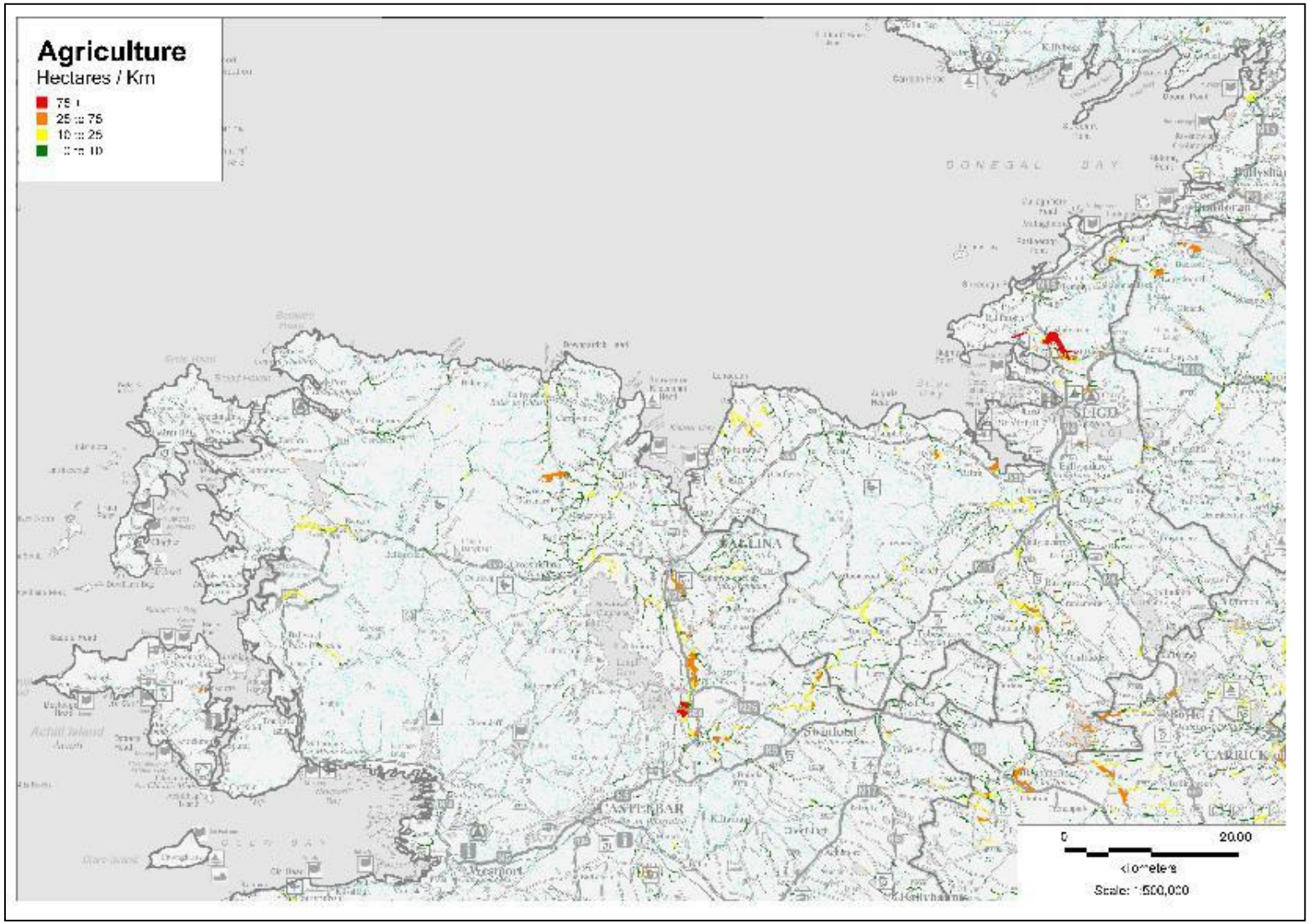
(Blank Page)

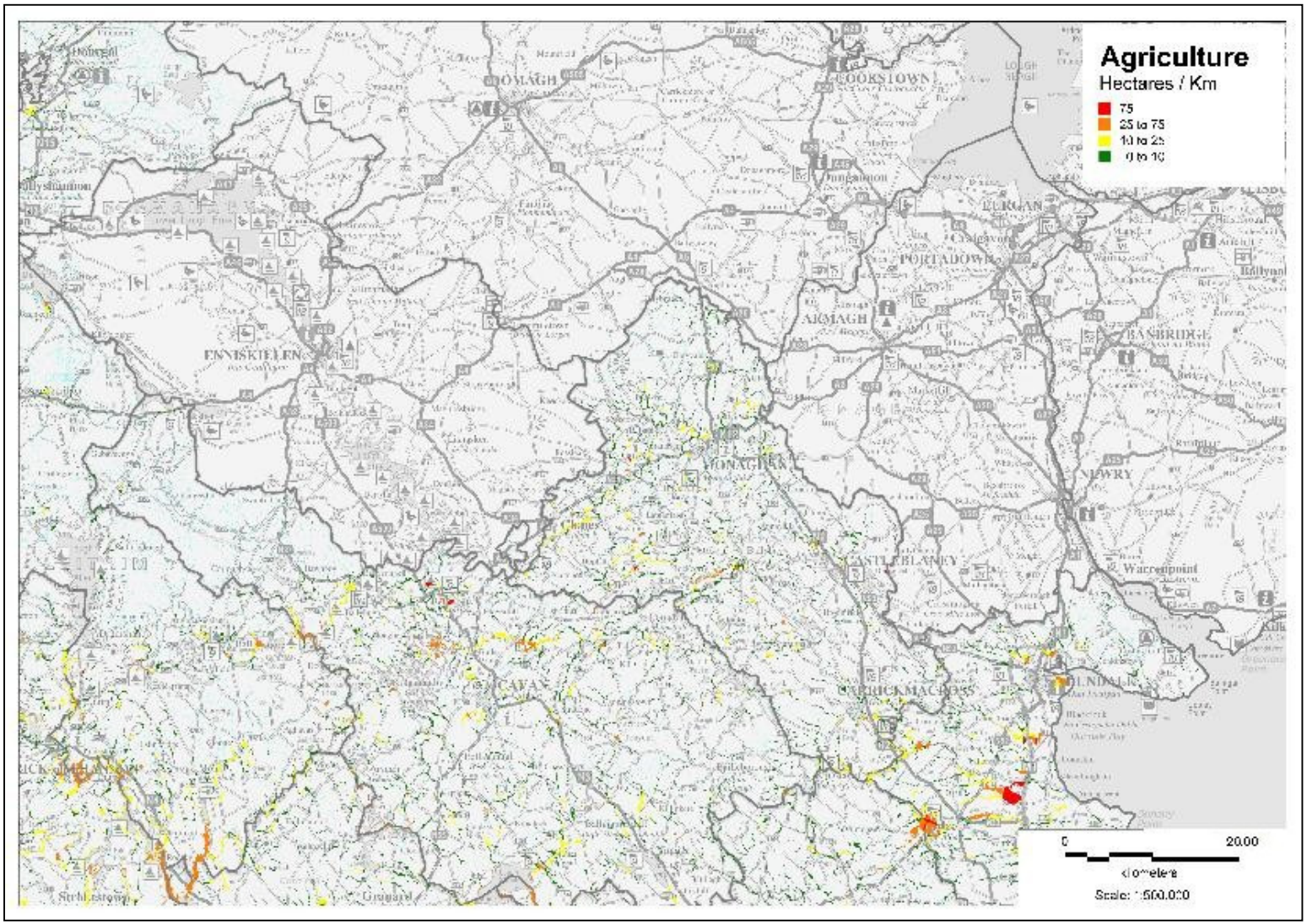
E.5. MAPS OF PREDICTIVE AGRICULTURAL FLOOD RISK

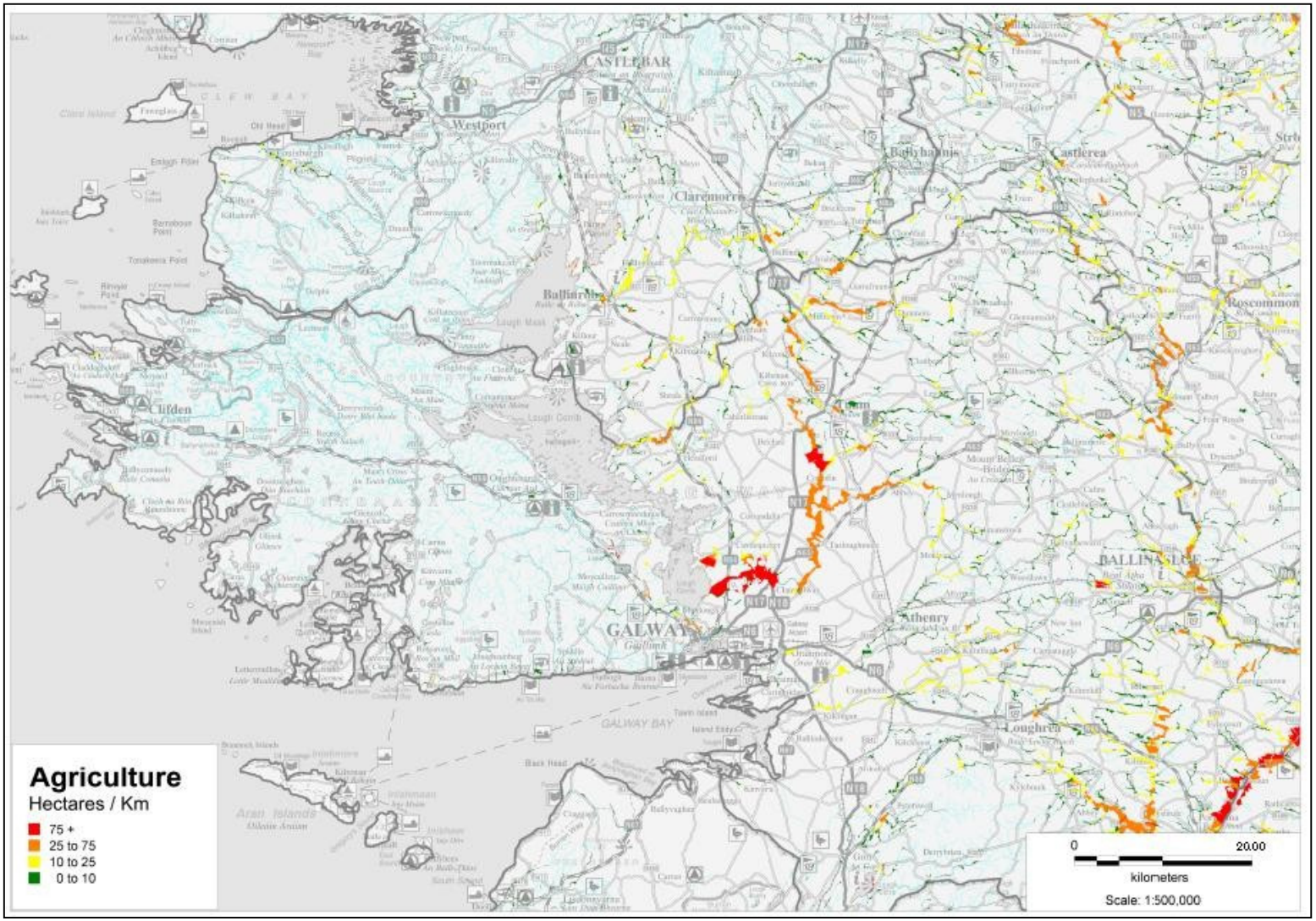


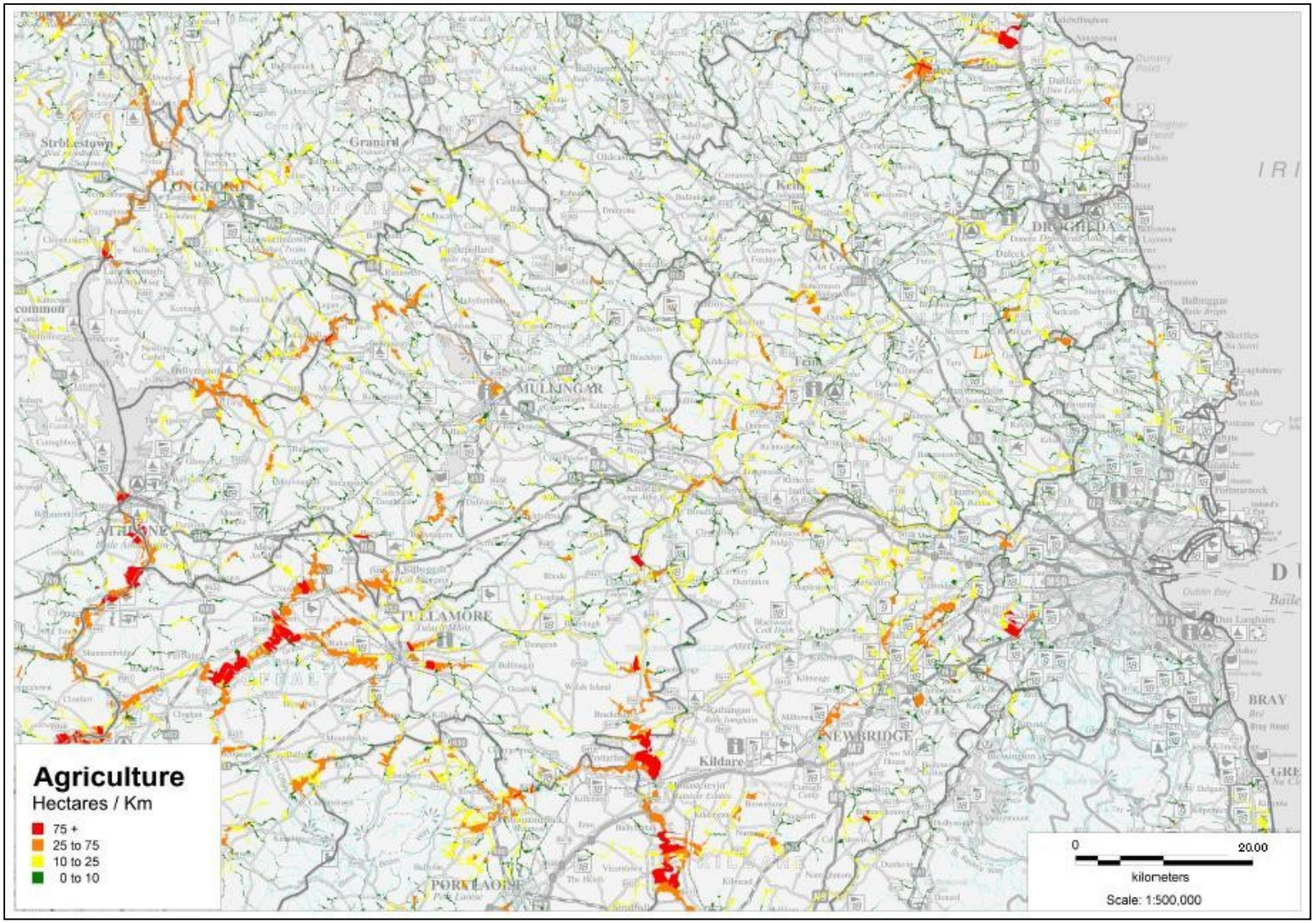


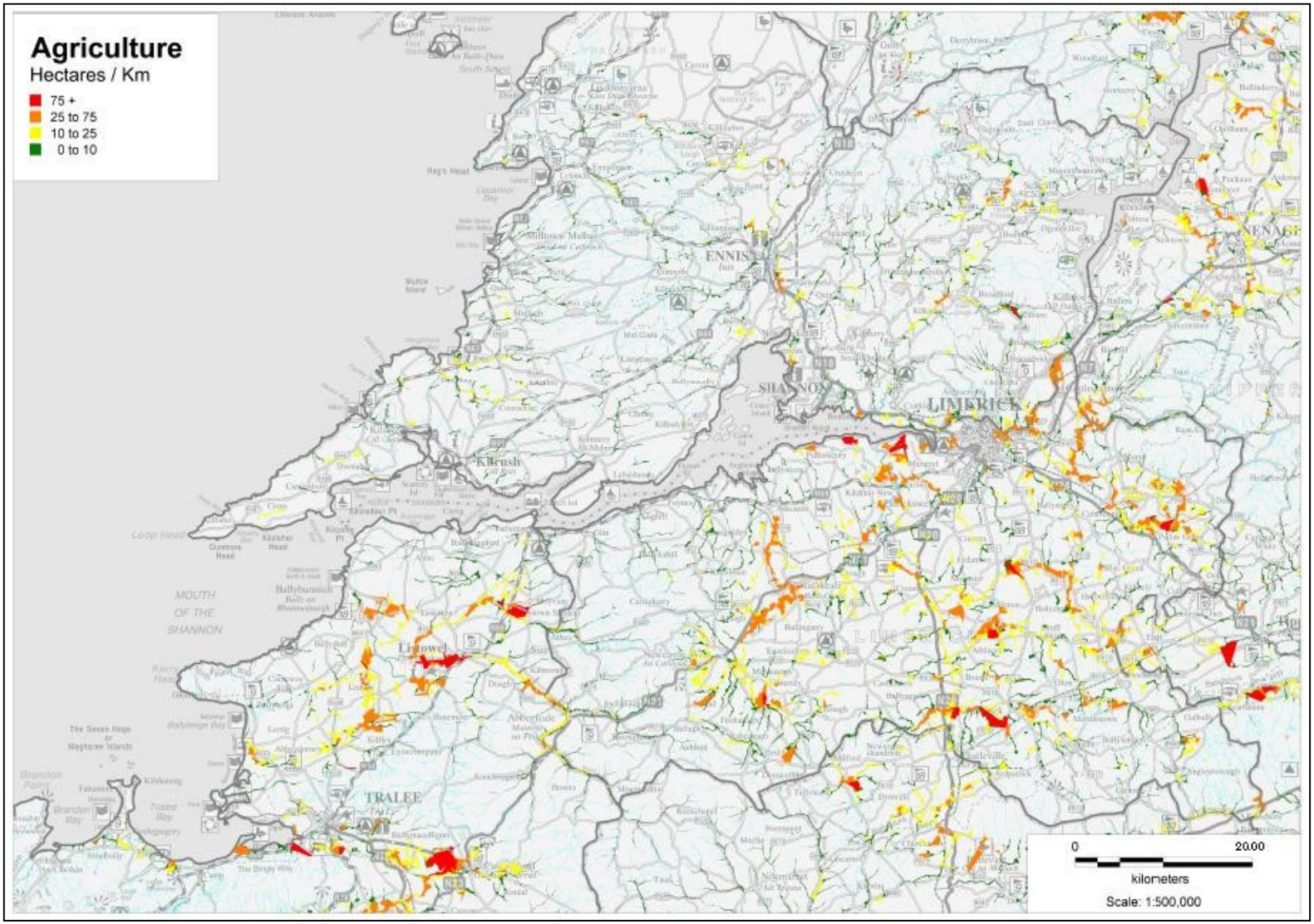
Agriculture
Hectares / Km
75 +
25 to 75
10 to 25
0 to 10
LETTERKENNY
LONDONDERRY
LIMAVADY
Strabane
OMAGH
Buncrana
Donegal
0
20.00
kilometers
Scale: 1:500,000

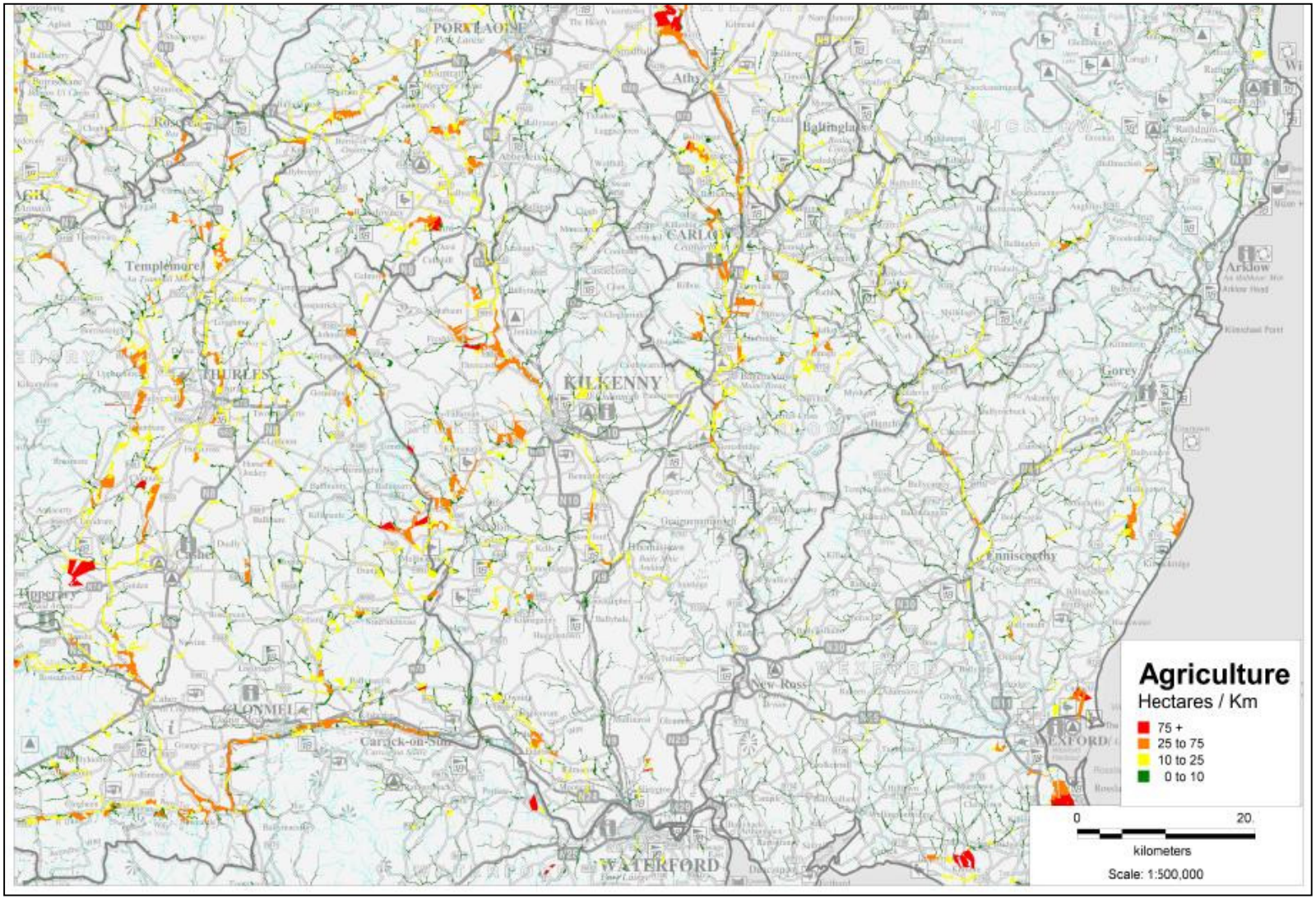

Agriculture
Hectares / Km
75 :: 1
25 :: 75
10 :: 25
0 :: 10
DONEGAL BAY
SLIGO
CARRICK
CASTLEBAR
0
20.00
Kilometers
Scale: 1:500,000

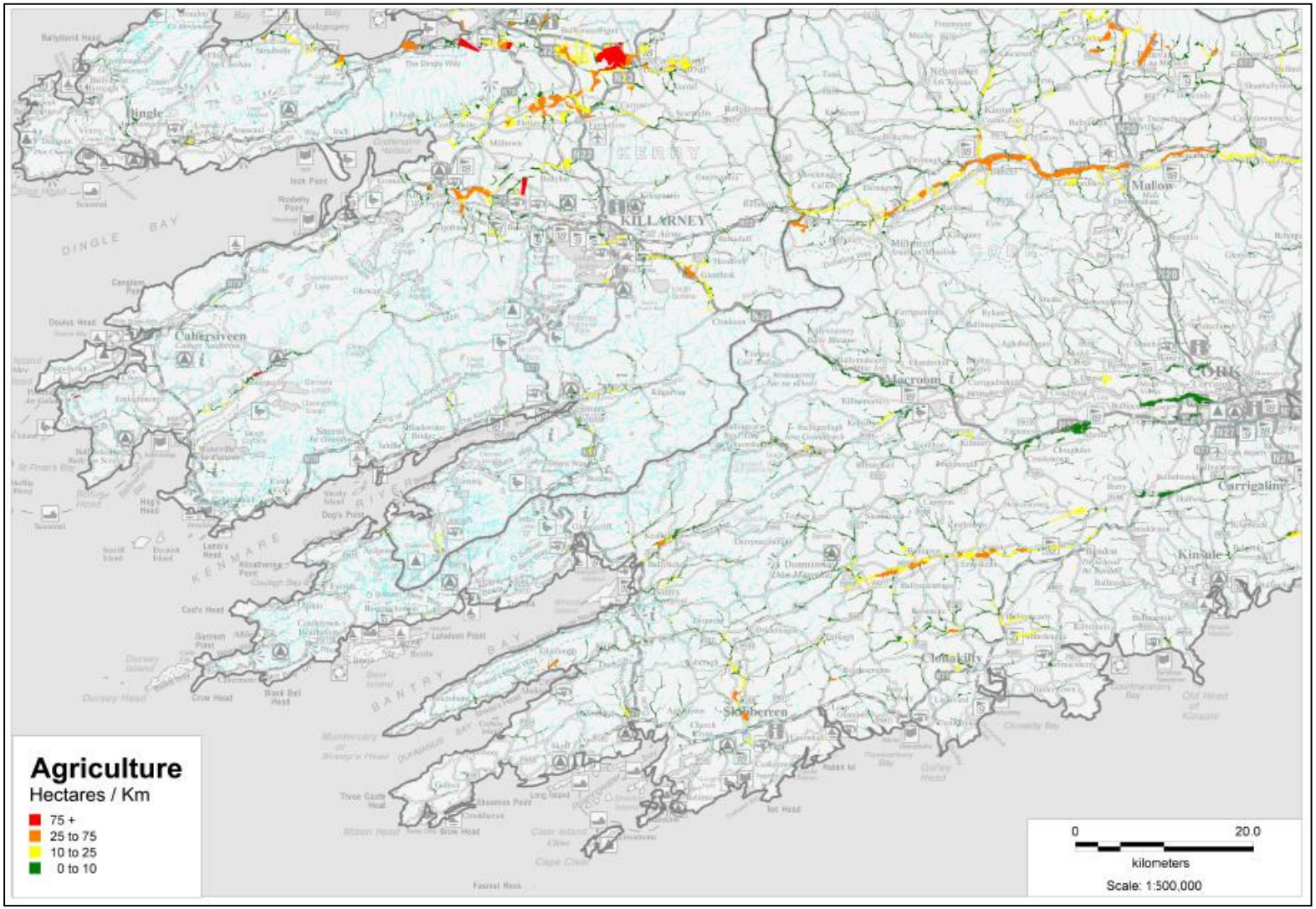

Agriculture
Hectares / Km
75
25 to 75
10 to 25
0 to 10
OMAGH
ENNISKILLEN
ARMAGH
NEWRY
CAVAN
0
20.00
Scale: 1:500,000

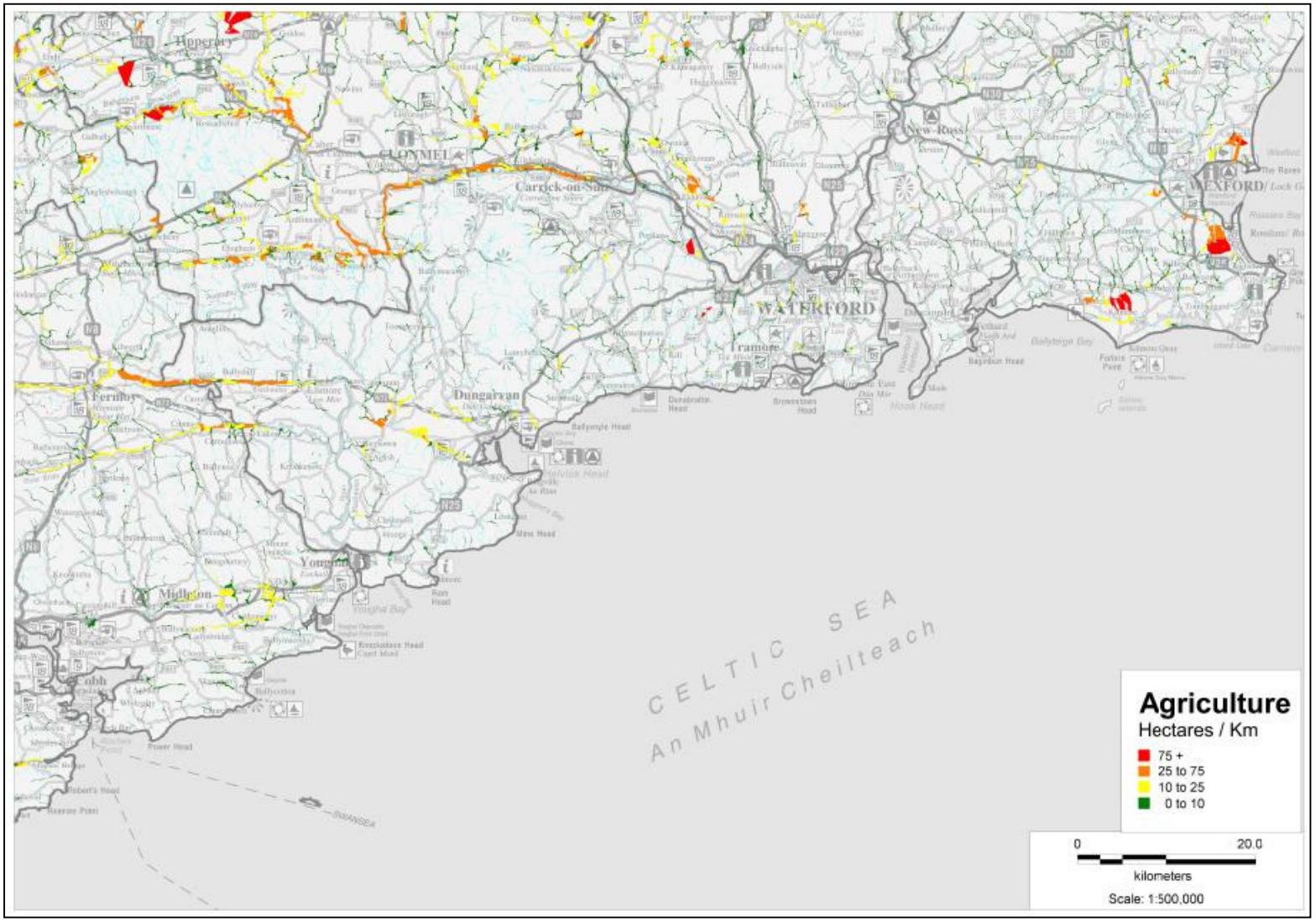

Agriculture
Hectares / Km
75 +
25 to 75
10 to 25
0 to 10
0
20.00
kilometers
Scale: 1:500,000
CASTLEBAR
Westport
Ballinrobe
Claremorris
Castlerea
Roscommon
Clifden
Tuam
GALWAY
Athenry
BALLINASLOE
Loughrea
GALWAY BAY
Aran Islands


Agriculture
Hectares / Km
75 +
25 to 75
10 to 25
0 to 10
0
20.00
kilometers
Scale: 1:500,000
Granard
LONGFORD
MULLINGAR
ATHLONE
TULLAMORE
Kildare
NEWBRIDGE
DROGHEDA
BRAY
PORTLAOISE


Agriculture
Hectares / Km
75 +
25 to 75
10 to 25
0 to 10
ENNIS
LIMERICK
Killrush
MOUTH
OF THE
SHANNON
Listowel
TRALEE
0
20.00
kilometers
Scale: 1:500,000


Agriculture
Hectares / Km
75 +
25 to 75
10 to 25
0 to 10
0
20
kilometers
Scale: 1:500,000
KILKENNY
CARLOW
WATERFORD
CLONMEL
Templemore
Arklow
Gorey
New Ross
Carrick-on-Suir


Agriculture
Hectares / Km
75 +
25 to 75
10 to 25
0 to 10
0
20.0
kilometers
Scale: 1:500,000
KILLARNEY
Cahersiveen
Macroom
Mallow
Cork
Carrigaline
Kinsale
Clonakilty
Skibbereen
Dingle


Agriculture
Hectares / Km
75 +
25 to 75
10 to 25
0 to 10
0
20.0
kilometers
Scale: 1:500,000
CELTIC SEA
An Mhuir Cheilteach
CLONMEL
Carrick-on-Suir
New-Ross
WEXFORD
WATERFORD
Tramore
Dungarvan
Fermoy
Youghal
Midleton
Cobh
SWANSEA

APPENDIX F

PROBABLE AND POSSIBLE AREAS FOR FURTHER ASSESSMENT

Set out in Table F.1 below are the probable and possible AFAs respectively related to natural sources of flooding (fluvial, sea water, groundwater). The principles and process for designation of AFAs is set out in Section 6.1.

The table does not include probable or possible AFAs related to environmental or agricultural risk (see Sections 6.2.1 and 6.2.2).

Probable and possible AFAs related to infrastructure owned and operated by the local authorities will be designated by the local authorities, taking into account the views and submissions made through the consultation process on the draft PFRA, subject to scrutiny of the OPW as Competent Authority for the implementation of the 'Floods' Directive in Ireland.

The ESB and Waterways Ireland have determined that there are no AFAs related to infrastructure that they own and operate.

(Blank Page)

TABLE F.1. PROBABLE AND POSSIBLE AREAS FOR FURTHER ASSESSMENT

County	ID No.	Location	Designation
Carlow	140151	Bagenalstown	Possible AFA
Carlow	120131	Ballykealey	Possible AFA
Carlow	120133	Bunclody	Probable AFA
Carlow	140155	Carlow	Probable AFA
Carlow	140166	Leighlinbridge	Probable AFA
Carlow	140171	Oldleighlin & Seskin Lowe	Possible AFA
Carlow	121332	Rathvilly	Possible AFA
Carlow	120141	Tullow	Probable AFA
Carlow	121353	Tullowphelim	Possible AFA
Cavan	360566	Annagelliff	Possible AFA
Cavan	360568	Ballyconnell	Probable AFA
Cavan	360570	Bawnboy	Possible AFA
Cavan	360571	Blacklion	Possible AFA
Cavan	365080	Butlersbridge	Possible AFA
Cavan	360572	Cavan	Probable AFA
Cavan	70038	Mullagh	Probable AFA
Cavan	70044	Virginia	Possible AFA
Clare	250402	1mon_Inishcaltra	Possible AFA
Clare	250405	Annacarriga	Possible AFA
Clare	250412	Bridgetown	Possible AFA
Clare	270471	Bunratty	Probable AFA
Clare	280484	Carrowmore	Probable AFA
Clare	252918	Cloonlara (Springfield)	Probable AFA
Clare	270473	Cranny	Possible AFA
Clare	270474	Ennis	Probable AFA
Clare	274150	Kilfenora	Possible AFA
Clare	270475	Kilkee	Probable AFA
Clare	270476	Kilrush	Probable AFA
Clare	270477	Limerick City	Probable AFA
Clare	270478	Lissan West	Probable AFA
Clare	250434	O'Briensbridge	Probable AFA
Clare	270480	Quinn	Possible AFA
Clare	250439	Raheen	Possible AFA
Clare	290491	Scanlans Island & Environ	Possible AFA
Clare	270481	Shannon & Shannon Airport	Probable AFA
Clare	270482	Sixmilebridge	Probable AFA
Cork	202474	Ardcahan	Possible AFA
Cork	180270	Ballyclough	Possible AFA
Cork	190292	Ballymakeery Ballyvourn	Probable AFA
Cork	200293	Bandon	Probable AFA
Cork	210307	Bantry	Probable AFA
Cork	180268	Buttevant	Possible AFA
Cork	190289	Carrigaline	Probable AFA
Cork	192399	Carrigtwohill	Possible AFA
Cork	180250	Castlelyons	Probable AFA
Cork	190277	Castlemartyr	Probable AFA
Cork	200294	Clonakilty	Probable AFA
Cork	190273	Coachford	Possible AFA
Cork	190286	Cork City	Probable AFA
Cork	190291	Douglas	Probable AFA
Cork	192424	Dromanallig	Possible AFA
Cork	200295	Dromore	Possible AFA
Cork	200296	Dunderrow	Possible AFA
Cork	200297	Dunmanway	Probable AFA

Cork	210309	Durrus	Probable AFA
Cork	180252	Fermoy	Probable AFA
Cork	180253	Freemount	Probable AFA
Cork	190290	Glanmire	Probable AFA
Cork	190268	Inchigeelagh	Probable AFA
Cork	200298	Inishannon	Probable AFA
Cork	180254	Kanturk	Probable AFA
Cork	210311	Kealkill	Possible AFA
Cork	210313	Kilcrohane	Possible AFA
Cork	180256	Killavullen	Possible AFA
Cork	190274	Killeagh	Possible AFA
Cork	190275	Ladysbridge	Possible AFA
Cork	190284	Little Island	Probable AFA
Cork	190270	Macroom	Probable AFA
Cork	180262	Mallow	Probable AFA
Cork	190279	Middleton& Ballynacorra	Probable AFA
Cork	242744	Milford	Possible AFA
Cork	180263	Mitchelstown	Possible AFA
Cork	190276	Mogeely	Possible AFA
Cork	180264	New Twopothouse Village	Possible AFA
Cork	180265	Rathcormack	Probable AFA
Cork	200301	Ross Carbery	Possible AFA
Cork	200302	Skibbereen	Probable AFA
Cork	200303	Skull	Probable AFA
Cork	190288	Togher	Probable AFA
Cork	190280	Tower	Probable AFA
Cork	190282	Whitegate	Probable AFA
Donegal	360565	1esb_Cloghore	Possible AFA
Donegal	380590	38_Carrickart Uplands_100	Possible AFA
Donegal	380591	Annagary	Possible AFA
Donegal	380592	Ardara	Probable AFA
Donegal	10002	Ballybofey/Stranorlar	Probable AFA
Donegal	390598	Ballymaleel	Possible AFA
Donegal	360569	Ballyshannon	Probable AFA
Donegal	390599	Bridge End	Possible AFA
Donegal	385321	Bunbeg-Derrybeg	Possible AFA
Donegal	390600	Buncrana	Probable AFA
Donegal	354928	Bundoran_&_Env	Possible AFA
Donegal	390601	Burnfoot	Probable AFA
Donegal	400616	Carndonagh	Probable AFA
Donegal	10632	Carrigans	Possible AFA
Donegal	380593	Carrowcannon	Possible AFA
Donegal	380594	Carrowkeel_100713	Probable AFA
Donegal	10003	Castlefinn	Possible AFA
Donegal	400617	Clonmany	Probable AFA
Donegal	10005	Convoy	Probable AFA
Donegal	370580	Donegal	Probable AFA
Donegal	380595	Downies	Probable AFA
Donegal	390603	Drumgohill	Possible AFA
Donegal	380596	Dunfanaghy	Probable AFA
Donegal	385339	Dungloe	Possible AFA
Donegal	380597	Glenties	Probable AFA
Donegal	370583	Inver	Possible AFA
Donegal	370584	Kilcar	Possible AFA
Donegal	370585	Killybegs	Probable AFA
Donegal	10007	Killygordon	Probable AFA
Donegal	390606	Kilmacrenan	Probable AFA
Donegal	370586	Laghy	Possible AFA
Donegal	390607	Letterkenny	Probable AFA

Donegal	10008	Lifford	Probable AFA
Donegal	400620	Malin	Probable AFA
Donegal	390609	Millford	Possible AFA
Donegal	400621	Moville	Probable AFA
Donegal	400622	Muff	Possible AFA
Donegal	390610	Newtown Cunningham	Probable AFA
Donegal	395418	Ramelton	Possible AFA
Donegal	370587	Rathinny Near Ballintra	Possible AFA
Donegal	390611	Rathmelton	Probable AFA
Donegal	390613	Rathmullan	Probable AFA
Donegal	390614	Speenogue	Possible AFA
Donegal	350563	Tullaghan	Possible AFA
Dublin	90070	Adamstown	Possible AFA
Dublin	80053	Balbriggan	Probable AFA
Dublin	90071	Balgriffin	Probable AFA
Dublin	90072	Belcamp Park	Probable AFA
Dublin	100114	Bray	Probable AFA
Dublin	90081	Clontarf	Probable AFA
Dublin	80055	Donabate	Probable AFA
Dublin	90082	Dublin City	Probable AFA
Dublin	91074	Esker South	Possible AFA
Dublin	90084	Finglas, Glasnevin	Probable AFA
Dublin	91077	Finnstown	Possible AFA
Dublin	91086	Hazelhatch	Possible AFA
Dublin	90088	Kinsaley	Probable AFA
Dublin	100121	Loughlinstown	Probable AFA
Dublin	90090	Lucan To Chapelizod	Probable AFA
Dublin	80057	Lusk	Probable AFA
Dublin	90091	Malahide	Probable AFA
Dublin	90093	Mulhuddart	Probable AFA
Dublin	105456	Old Connaught/Wilford	Possible AFA
Dublin	80058	Oldtown	Probable AFA
Dublin	80059	Portrane	Probable AFA
Dublin	90096	Raheny	Probable AFA
Dublin	90097	Rathcoole, Saggart & Bald	Probable AFA
Dublin	80061	Rush	Probable AFA
Dublin	90099	Santry	Probable AFA
Dublin	90100	Santry Demesne	Possible AFA
Dublin	105455	Shankhill (Crinken)	Possible AFA
Dublin	80062	Skerries	Probable AFA
Dublin	80063	Staffordstown Turvey	Probable AFA
Dublin	90102	Sutton & Baldoyle	Probable AFA
Dublin	90103	Sutton & Howth North	Probable AFA
Dublin	80064	Swords	Probable AFA
Dublin	90104	Swords (South)	Probable AFA
Galway	300492	1esb_Ballygaddy	Possible AFA
Galway	250399	Abbey	Possible AFA
Galway	304468	Addergoole (Ed Annaghdown	Possible AFA
Galway	263234	Ahascragh	Possible AFA
Galway	310513	An Chathair	Possible AFA
Galway	310514	An Cheathru Rua (Carraroe	Possible AFA
Galway	294225	Ardrahan North	Possible AFA
Galway	260451	Ballinasloe	Probable AFA
Galway	294251	Ballynacourty	Possible AFA
Galway	250409	Banagher	Possible AFA
Galway	310515	Bearna	Possible AFA
Galway	310516	Both Chunna Thiar	Possible AFA
Galway	304528	Carnmore East	Possible AFA
Galway	300497	Claregalway	Probable AFA

Galway	290493	Clarinbridge	Possible AFA
Galway	320523	Clifden	Possible AFA
Galway	252906	Clonfert North (Seymour)	Possible AFA
Galway	304562	Cong	Possible AFA
Galway	300499	Corrofin	Probable AFA
Galway	294316	Craughwell	Possible AFA
Galway	294331	Frenchfort	Possible AFA
Galway	300502	Galway City	Probable AFA
Galway	294338	Gort	Possible AFA
Galway	300503	Headford	Possible AFA
Galway	300504	Inchiquin	Possible AFA
Galway	300505	Inishmicatreer	Possible AFA
Galway	260463	Kilconnell	Possible AFA
Galway	294367	Kiltartan	Possible AFA
Galway	290487	Kinvarra	Possible AFA
Galway	290488	Knockakilleen & Environs	Possible AFA
Galway	300507	Knocknacarra	Probable AFA
Galway	310517	Knocknacarra_Rusheen Bay	Possible AFA
Galway	290489	Loughrea	Probable AFA
Galway	304654	Maum West	Possible AFA
Galway	310518	Na Forbacha	Possible AFA
Galway	310519	Na Haille	Possible AFA
Galway	305486	Newtownabbey	Possible AFA
Galway	290490	Oranmore	Probable AFA
Galway	300508	Oughterard	Probable AFA
Galway	250437	Portumna	Probable AFA
Galway	300510	Tuam	Probable AFA
Galway	GW-29009	Galway City And Suburbs	Probable AFA
Galway	GW-29003	Kilcornan/Rohvehagh	Probable AFA
Galway	GW-25010	Derryfrench	Probable AFA
Kerry	210305	1mon_Church Island	Possible AFA
Kerry	230341	Abbeydorney	Probable AFA
Kerry	222579	Anascaul	Possible AFA
Kerry	232629	Ardfert	Possible AFA
Kerry	230342	Aughacasla	Possible AFA
Kerry	230344	Ballyheige	Possible AFA
Kerry	240370	Ballylongford	Probable AFA
Kerry	222583	Ballymalis	Possible AFA
Kerry	230345	Banna	Probable AFA
Kerry	220320	Boolteens	Possible AFA
Kerry	230346	Carhoonaknock	Possible AFA
Kerry	220323	Castleisland	Possible AFA
Kerry	220324	Castlemaine	Probable AFA
Kerry	220325	Coolroe Lower	Possible AFA
Kerry	220326	Cordal	Possible AFA
Kerry	222594	Cromane, Kerry	Possible AFA
Kerry	222595	Curreal	Possible AFA
Kerry	222596	Derreenacullig	Possible AFA
Kerry	230349	Derryquay	Possible AFA
Kerry	220327	Dingle	Probable AFA
Kerry	230351	Dromroe	Possible AFA
Kerry	220329	Faha West	Possible AFA
Kerry	220330	Farranfore	Possible AFA
Kerry	220331	Fieries	Possible AFA
Kerry	225503	Fossa	Possible AFA
Kerry	220333	Glenbeigh	Possible AFA
Kerry	225502	Glenflesk	Possible AFA
Kerry	220335	Gortnacarriga	Possible AFA
Kerry	210312	Kenmare	Probable AFA

Kerry	232681	Kilfenora	Possible AFA
Kerry	220337	Killarney	Probable AFA
Kerry	220338	Killorglin	Probable AFA
Kerry	230356	Lisselton	Possible AFA
Kerry	230357	Listowel	Probable AFA
Kerry	220339	Milltown	Probable AFA
Kerry	230359	Moher	Possible AFA
Kerry	232679	Moneycashen	Possible AFA
Kerry	220340	Portmagee	Probable AFA
Kerry	182363	Rathmore	Possible AFA
Kerry	222623	Rossbehy	Possible AFA
Kerry	212577	Sneem	Possible AFA
Kerry	210315	Templenoe	Possible AFA
Kerry	230361	Tralee	Probable AFA
Kildare	90068	1power_Longstone	Possible AFA
Kildare	140147	Allenwood	Probable AFA
Kildare	140150	Athy	Probable AFA
Kildare	141393	Aughrim	Possible AFA
Kildare	141399	Ballitore	Possible AFA
Kildare	91019	Ballymore Eustace	Possible AFA
Kildare	90073	Blacktrench	Possible AFA
Kildare	140153	Blackwood	Possible AFA
Kildare	90075	Carragh	Possible AFA
Kildare	140156	Castledermot	Probable AFA
Kildare	90076	Celbridge	Probable AFA
Kildare	90078	Clane	Probable AFA
Kildare	91080	Grange	Possible AFA
Kildare	90086	Johnstown (Ne Naas)	Possible AFA
Kildare	91095	Kilcock	Probable AFA
Kildare	91096	Kilcullen	Possible AFA
Kildare	90087	Kill	Possible AFA
Kildare	90089	Leixlip	Probable AFA
Kildare	90092	Maynooth	Probable AFA
Kildare	90094	Naas	Probable AFA
Kildare	90095	Newbridge	Probable AFA
Kildare	140170	Old River Bridge	Possible AFA
Kildare	140175	Rathangan	Probable AFA
Kildare	141635	Riverstown	Possible AFA
Kildare	91153	Roestown	Possible AFA
Kildare	91156	Sallins	Possible AFA
Kildare	90101	Straffan	Possible AFA
Kildare	140178	Suncroft	Possible AFA
Kildare	90105	Turnings	Possible AFA
Kilkenny	150181	Ballyhale	Possible AFA
Kilkenny	150182	Ballyragget	Possible AFA
Kilkenny	151688	Bennettsbridge	Possible AFA
Kilkenny	150185	Callan	Possible AFA
Kilkenny	161946	Fiddown	Probable AFA
Kilkenny	150190	Freshford	Possible AFA
Kilkenny	165465	Gorteen	Possible AFA
Kilkenny	140162	Graiguenamanagh	Probable AFA
Kilkenny	150192	Inistioge	Probable AFA
Kilkenny	150194	Kilkenny-Breagagh	Probable AFA
Kilkenny	162013	Kilmacow	Possible AFA
Kilkenny	162079	Mooncoin	Possible AFA
Kilkenny	150195	Mountrath	Possible AFA
Kilkenny	160232	Mullinavat	Probable AFA
Kilkenny	160234	Owning	Possible AFA
Kilkenny	160235	Piltown	Probable AFA

Kilkenny	150201	Thomastown	Probable AFA
Kilkenny	150202	Threecastles	Possible AFA
Kilkenny	160242	Waterford	Probable AFA
Laois	150183	Ballyroan	Probable AFA
Laois	140152	Barnashrone	Possible AFA
Laois	151691	Borris In Ossory	Possible AFA
Laois	150184	Bowe's Cross Roads	Possible AFA
Laois	150186	Camross	Possible AFA
Laois	140157	Clogrenan Bridge	Possible AFA
Laois	250420	Clonaslee	Probable AFA
Laois	140164	Killeen	Possible AFA
Laois	140165	Killeshin	Probable AFA
Laois	140167	Monasterevin	Probable AFA
Laois	140168	Mountmellick	Probable AFA
Laois	150198	Mountrath	Possible AFA
Laois	150199	Oldtown	Possible AFA
Laois	140173	Portarlington	Probable AFA
Laois	140174	Portlaoise	Probable AFA
Laois	150200	Rathdowney	Possible AFA
Laois	140176	Ratheven & Ballyroan	Probable AFA
Laois	145460	Rosenallis	Possible AFA
Laois	140177	Stradbally	Possible AFA
Laois	140179	Timahoe	Possible AFA
Leitrim	360567	Ballinamore	Possible AFA
Leitrim	260455	Carrickonshannon	Probable AFA
Leitrim	260459	Drumshanbo	Probable AFA
Leitrim	365490	Keshcarrig	Possible AFA
Leitrim	263853	Leitrim	Possible AFA
Leitrim	350557	Manorhamilton	Probable AFA
Leitrim	260466	Mohill	Probable AFA
Limerick	232632	Abbeyfeale	Possible AFA
Limerick	240364	Adare	Probable AFA
Limerick	252771	Annacotty	Possible AFA
Limerick	240365	Askeaton	Probable AFA
Limerick	232630	Athea	Probable AFA
Limerick	242701	Bruff	Possible AFA
Limerick	242702	Bruree	Possible AFA
Limerick	250413	Caherconlish	Possible AFA
Limerick	250415	Cappamore	Probable AFA
Limerick	252889	Castleconnell	Probable AFA
Limerick	250417	Castletroy	Probable AFA
Limerick	240376	Charleville	Probable AFA
Limerick	240377	Clarina	Probable AFA
Limerick	240381	Croom	Probable AFA
Limerick	242722	Dromcolliher	Probable AFA
Limerick	240383	Foynes	Probable AFA
Limerick	160220	Galbally	Possible AFA
Limerick	250424	Garryglass	Probable AFA
Limerick	240385	Kildimo New	Probable AFA
Limerick	240386	Killacolla	Possible AFA
Limerick	242738	Kilmacow	Possible AFA
Limerick	240388	Kilmallock	Probable AFA
Limerick	240390	Monaster	Possible AFA
Limerick	240392	Newcastle West	Probable AFA
Limerick	253142	Oola	Possible AFA
Limerick	240393	Patrickswell	Possible AFA
Limerick	240394	Rathkeale	Probable AFA
Limerick	240396	Strand	Probable AFA
Longford	260444	1esb_Lanesbrough	Possible AFA

Longford	260446	Abbeyshrule	Probable AFA
Longford	260453	Ballymahon	Possible AFA
Longford	263472	Cloondara	Possible AFA
Longford	260460	Edgeworthstown	Probable AFA
Longford	265473	Elfeet	Possible AFA
Longford	260464	Longford	Probable AFA
Louth	60013	Annagassan	Probable AFA
Louth	60014	Ardee	Probable AFA
Louth	70030	Baltray	Possible AFA
Louth	60015	Blackrock South	Possible AFA
Louth	60016	Carlingford & Greenore	Probable AFA
Louth	70033	Drogheda	Probable AFA
Louth	60718	Dromiskin	Possible AFA
Louth	60019	Dundalk	Probable AFA
Louth	65450	Greenmount	Possible AFA
Louth	60020	Inishkeen	Possible AFA
Louth	60023	Rathcor, Cooley	Possible AFA
Louth	60766	Tallanstown	Possible AFA
Louth	60024	Termonfeckin	Probable AFA
Louth	70043	Tullyallen	Possible AFA
Mayo	340531	1sch_Carha	Possible AFA
Mayo	300494	1sch_Clogher	Possible AFA
Mayo	320522	1sch_Cloondaff	Possible AFA
Mayo	340532	1sch_Kildaree	Possible AFA
Mayo	340534	Ballina & Environs	Probable AFA
Mayo	300495	Ballinrobe	Possible AFA
Mayo	300496	Ballyhaunis	Probable AFA
Mayo	340535	Ballysakeery & Abbeytown	Possible AFA
Mayo	340537	Bunnyconnellan	Possible AFA
Mayo	340538	Castlebar	Probable AFA
Mayo	340541	Crossmolina	Probable AFA
Mayo	340542	Foxford	Probable AFA
Mayo	320526	Louisburgh	Probable AFA
Mayo	324767	Newport	Possible AFA
Mayo	340543	Swinford	Probable AFA
Mayo	320527	Westport	Probable AFA
Mayo	320528	Westport Bay	Possible AFA
Mayo	320529	Westport Quay	Probable AFA
Meath	70025	1esb_Grangeageeth	Possible AFA
Meath	70026	1esb_Randalstown	Possible AFA
Meath	80049	1sch_Kilbride	Possible AFA
Meath	70919	1wt_Stalleen	Possible AFA
Meath	80052	Ashbourne	Probable AFA
Meath	70028	Athboy	Probable AFA
Meath	70029	Ballivor	Probable AFA
Meath	70031	Bettystown	Probable AFA
Meath	90079	Clonee	Probable AFA
Meath	80056	Duleek	Probable AFA
Meath	90083	Dunboyne	Probable AFA
Meath	80067	Gormanston	Possible AFA
Meath	70035	Johnstown Bridge	Probable AFA
Meath	70036	Kildalkey	Possible AFA
Meath	60021	Kilmainhamwood	Possible AFA
Meath	70037	Kilmessan	Probable AFA
Meath	70888	Longwood	Possible AFA
Meath	70880	Mornington	Probable AFA
Meath	70039	Navan	Probable AFA
Meath	80060	Ratoath	Probable AFA
Meath	70915	Slane Bridge	Possible AFA

Meath	70041	Trim	Probable AFA
Monaghan	365061	Annaghkilly	Possible AFA
Monaghan	60017	Carrickmacross	Probable AFA
Monaghan	60699	Castleblayney_&_Env	Possible AFA
Monaghan	365094	Clones_&_Environs	Possible AFA
Monaghan	30010	Drumgoole	Possible AFA
Monaghan	30011	Monaghan	Probable AFA
Monaghan	360576	Scotshouse	Possible AFA
Monaghan	360577	Smithborough	Possible AFA
Offaly	250400	1esb_Shannonbridge	Possible AFA
Offaly	250403	1pow_Limcloon	Possible AFA
Offaly	250410	Birr	Probable AFA
Offaly	250418	Clara	Probable AFA
Offaly	141464	Clonbulloge	Possible AFA
Offaly	140159	Daingean	Probable AFA
Offaly	70849	Edenderry_&_Env	Possible AFA
Offaly	253003	Ferbane	Possible AFA
Offaly	253051	Kilcormac	Probable AFA
Offaly	253069	Kinnitty	Possible AFA
Offaly	253115	Moneygall	Possible AFA
Offaly	250436	Pollagh	Probable AFA
Offaly	250438	Rahan	Probable AFA
Offaly	255470	Shannon Harbour	Probable AFA
Offaly	250443	Tullamore	Probable AFA
Roscommon	265481	Athleague	Possible AFA
Roscommon	260450	Ballaghaderreen 2 Of 2	Probable AFA
Roscommon	263286	Ballyfarnan	Possible AFA
Roscommon	260454	Boyle	Probable AFA
Roscommon	260456	Castlerea	Probable AFA
Roscommon	263661	Dromod	Possible AFA
Roscommon	263775	Jamestown	Possible AFA
Roscommon	265482	Knockvicar	Possible AFA
Roscommon	260445	Lough Gara	Possible AFA
Roscommon	260467	Roosky	Possible AFA
Roscommon	260468	Roscommon	Probable AFA
Roscommon	264007	Strokestown	Possible AFA
Sligo	350545	1sch_Sooey	Possible AFA
Sligo	350547	Ballymote	Probable AFA
Sligo	350548	Ballysadare&Environs	Probable AFA
Sligo	340539	Charlestown	Probable AFA
Sligo	350549	Collooney	Probable AFA
Sligo	350550	Coolaney	Probable AFA
Sligo	350551	Drumard	Possible AFA
Sligo	350552	Drumcliff & Carney	Possible AFA
Sligo	350554	Gorteen	Probable AFA
Sligo	350555	Grange	Probable AFA
Sligo	354987	Grange	Possible AFA
Sligo	350558	Rathbraghan_Sligo Town	Probable AFA
Sligo	350559	Riverstown	Probable AFA
Sligo	350561	Sligo Town	Probable AFA
Sligo	340544	Tobercurry	Probable AFA
Sligo	350564	Willowbrock & Environs	Possible AFA
Tipperary	160204	1nur_Dundrum_Boherboy	Possible AFA
Tipperary	160205	Ardfinnan	Probable AFA
Tipperary	160206	Ballinaclogh	Possible AFA
Tipperary	165497	Ballinunty	Possible AFA
Tipperary	165498	Ballylooby	Possible AFA
Tipperary	160208	Ballyporeen	Probable AFA
Tipperary	160209	Bansha	Probable AFA

Tipperary	250411	Borrisokane	Probable AFA
Tipperary	160210	Borrisoleigh	Probable AFA
Tipperary	160211	Caher	Probable AFA
Tipperary	160212	Carrick-On-Suir	Probable AFA
Tipperary	255469	Carrigahorig	Possible AFA
Tipperary	160213	Clogheen	Probable AFA
Tipperary	160216	Clonmel	Probable AFA
Tipperary	252978	Dromineer	Possible AFA
Tipperary	160219	Fethard	Probable AFA
Tipperary	160221	Golden	Probable AFA
Tipperary	160224	Hollyford	Possible AFA
Tipperary	150193	Kilkenny - Nore	Probable AFA
Tipperary	250427	Killaloe	Probable AFA
Tipperary	250428	Limerick Junction	Possible AFA
Tipperary	160230	Marlfield	Probable AFA
Tipperary	255475	Monard	Possible AFA
Tipperary	160231	Mullinahone	Probable AFA
Tipperary	250432	Nenagh	Probable AFA
Tipperary	160233	Newcastle	Probable AFA
Tipperary	250433	Newport	Probable AFA
Tipperary	160236	Rathkea	Possible AFA
Tipperary	250440	Roscrea	Probable AFA
Tipperary	160238	Templemore	Probable AFA
Tipperary	160239	Thurles	Probable AFA
Tipperary	160240	Tipperary Town	Probable AFA
Tipperary	162157	Toor More	Possible AFA
Waterford	180247	Aglish	Possible AFA
Waterford	180248	Ballyduff	Probable AFA
Waterford	170243	Ballynacourty	Possible AFA
Waterford	180249	Cappoquin	Possible AFA
Waterford	161875	Cheekpoint, Waterford	Possible AFA
Waterford	180251	Clashmore	Possible AFA
Waterford	175469	Duckspool/Sallybrook	Possible AFA
Waterford	170244	Dungarvan	Probable AFA
Waterford	170245	Dunmore East	Probable AFA
Waterford	161983	Greenan	Possible AFA
Waterford	172210	Killadangan	Possible AFA
Waterford	180260	Lismore	Possible AFA
Waterford	175470	Newtown	Possible AFA
Waterford	172222	Passage East	Possible AFA
Waterford	162103	Portlaw	Probable AFA
Waterford	170246	Ringphuca	Probable AFA
Waterford	180266	Tallow	Probable AFA
Waterford	172228	Tramore_&_Env	Possible AFA
Waterford	172230	Woodstown Lower	Possible AFA
Waterford	180267	Youghal	Probable AFA
Westmeath	260448	Athlone	Probable AFA
Westmeath	250426	Kilbeggan	Probable AFA
Westmeath	70027	Milltownpass	Possible AFA
Westmeath	250431	Mullingar	Probable AFA
Westmeath	70911	Riverstown	Possible AFA
Wexford	120130	Ballyhire - St Helens	Possible AFA
Wexford	110125	Blackwater	Possible AFA
Wexford	130143	Bridgetown	Possible AFA
Wexford	120134	Carricklawn-Wexford	Possible AFA
Wexford	121291	Castlebridge	Possible AFA
Wexford	120135	Clonard	Possible AFA
Wexford	110126	Courtown	Probable AFA
Wexford	120143	Curracloe	Possible AFA

Wexford	120137	Enniscorthy	Probable AFA
Wexford	120138	Fairfield & Cherryorchard	Possible AFA
Wexford	131373	Fethard	Possible AFA
Wexford	110127	Gorey	Probable AFA
Wexford	130146	Kilmore	Probable AFA
Wexford	141599	New Ross_&_Env	Possible AFA
Wexford	125457	North Slobs	Probable AFA
Wexford	120144	Rosslare	Possible AFA
Wexford	125456	South Slobs / Rosslare Po	Probable AFA
Wexford	120142	Wexford	Probable AFA
Wicklow	100106	1esb_Shelton Abbey	Possible AFA
Wicklow	120128	1esb_Shillelagh	Possible AFA
Wicklow	90069	1power_Pollaphuca	Possible AFA
Wicklow	100108	Annacurragh	Possible AFA
Wicklow	100109	Arklow	Probable AFA
Wicklow	100110	Ashford & Rathnew	Probable AFA
Wicklow	100111	Aughrim	Probable AFA
Wicklow	100112	Avoca	Probable AFA
Wicklow	100113	Balliaclash	Possible AFA
Wicklow	120132	Baltinglass	Probable AFA
Wicklow	90074	Blessington	Possible AFA
Wicklow	105454	Brittas Bay	Possible AFA
Wicklow	100115	Charlesland	Possible AFA
Wicklow	100116	Enniskerry	Probable AFA
Wicklow	100107	Glendalough	Possible AFA
Wicklow	140163	Grange Con	Possible AFA
Wicklow	100117	Greystones/Charlesland	Probable AFA
Wicklow	90085	Hollywood	Possible AFA
Wicklow	100118	Kilcoole	Possible AFA
Wicklow	100119	Killiskey	Possible AFA
Wicklow	100120	Kilmacanoge	Possible AFA
Wicklow	100122	Newcastle	Possible AFA
Wicklow	100123	Rathdrum	Possible AFA
Wicklow	100124	Wicklow	Probable AFA