CHAPTER 14
FLOOD RISK MANAGEMENT

14.0 Introduction

Flooding is a natural phenomenon of the hydrological cycle. It constitutes a temporary covering of land by water and presents a risk only when people and human assets are present in the area which floods. Flooding can happen at any time in a wide variety of locations. Different types of flooding include overland flows, river flooding, coastal flooding, groundwater flooding, estuarial flooding and flooding resulting from the failure of infrastructure. Rivers with a low gradient are more susceptible to flooding at any time of the year; however, the increasing tendency for heavy summer downpours can also cause significant flooding in steep, flashy catchments.

Flooding can pollute water and cause significant damage to human life, the local economy, local biodiversity and local public health. Like any other natural process, flooding cannot be completely eliminated, but its impacts can be avoided or minimised with proactive and environmentally sustainable management and planning.

Projections for climate change include continued sea level rise, potentially more severe Atlantic storms, which could generate more significant storm surges and extreme waves, increase in the number of heavy rainfall days each year, and wetter winters. The potential impacts from these projections include increasing flood risk for communities and infrastructure along rivers, estuaries and the coast with accelerating rates of coastal erosion; threatening coastal habitats and environment.

Climate change will impact on different aspects of the national flood risk management programme. These impacts, and the need to take adaptive action to address them, vary across the different programmes of work within flood risk management, with the highest priority impacts being on flood protection, spatial planning and development management. Non-structural flood risk management measures (e.g., preparedness measures) tend to be more inherently adaptable to changes in flood frequency and severity, and 'green' measures, such as natural water retention measures also facilitate adaptation while providing benefits to other sectors (e.g., improve water quality and biodiversity, contribute towards carbon mitigation)

With reference to the **National, Regional and County Objectives** set out in Chapter 2 of this plan, ensuring that flood risk is appropriately managed will contribute to numerous goals across the three pillars of 'sustainable healthy communities', 'climate action' and 'economic opportunity' including:

- Reduction and management of flood risk;
- To build resilience to increased risks of extreme weather events, changes in sea level and patterns of coastal erosion to protect property, critical infrastructure and food security;
- To conserve and enhance biodiversity, protected habitats and species;
- To identify, protect and enhance Green Infrastructure and ecosystem services and promote the sustainable management of strategic natural assets such as coastlines, farmlands, peatlands, uplands woodlands and wetlands;
- Promoting environmentally sustainable development in terms of location, layout, design and energy and water usage.

14.1 Context

The following EU and national plans / strategies have been taken into account in the development of the approach of addressing flood risk in this County Development Plan.

14.1.1 EU Floods Directive 2007

Directive 2007/60/EC on the assessment and management of flood risks entered into force on 26 November 2007. This Directive requires Member States to assess if all water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk.

Its aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive requires Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.

The Directive shall be carried out in coordination with the Water Framework Directive, notably by flood risk management plans and river basin management plans being coordinated, and through coordination of the public participation procedures in the preparation of these plans. All assessments, maps and plans prepared shall be made available to the public

Member States shall furthermore coordinate their flood risk management practices in shared river basins, including with third countries, and shall in solidarity not undertake measures that would increase the flood risk in neighbouring countries. Member States shall take into consideration long term developments, including climate change, as well as sustainable land use practices in the flood risk management cycles addressed in this Directive.

14.1.2 National Preliminary Flood Risk Assessment (PFRA)

The Preliminary Flood Risk Assessment (PFRA) is a requirement of the EU Floods Directive that is aimed at identifying through a national screening exercise the Areas of Potentially Significant Flood Risk, or Areas for Further Assessment (AFAs) as they were referred to in Ireland. The AFAs are the areas where, under the Floods Directive, detailed flood maps need to be produced and for which flood risk management measures need to be assessed to reduce and manage the risk.

In Ireland the first cycle PFRA involved:

- Reviewing records of floods that have happened in the past (the historic assessment);
- Undertaking analysis to determine which areas might flood in the future, and what the impacts might be (the 'predictive' assessment); and,
- Consulting with the Local Authorities, Government Departments, other public agencies and members of the public.

The assessment has considered all types of flooding such as from rivers, the sea and estuaries, heavy rain and groundwater, and also from man-made sources, such as the failure of built infrastructure. It has included the impacts flooding can have on people, property, businesses, the environment and cultural heritage.

The first cycle PFRA identified 300 AFAs. Under the CFRAM Programme and other location-specific projects, detailed flood hazard and risk assessments were subsequently undertaken for these areas, as described below.

The Floods Directive is cyclical and as part of the second and subsequent cycles, the OPW and other relevant authorities are required to review, and if necessary update, the PFRA in relation to the potential sources of flooding they have responsibilities for. This review builds on the work of previous cycles, taking into account floods that may have occurred at the time of the reviews.

14.1.3 National Indicative Flood Mapping

Produced by the OPW, these maps are 'predictive' flood maps showing indicative areas predicted to be inundated during a theoretical fluvial flood event with an estimated probability of occurrence. Flood Zone A is represented by the 1% AEP extent and Flood Zone B by the 0.1% AEP event.

Indicative flood maps have been produced for all watercourses that are on the EPA watercourse layers "WATER_RivNetRoutes" and "WFD_LakeSegment", have a catchment area greater than 5km^2, and for which flood maps were not produced under the National CFRAM Programme

14.1.4 Irish Coastal Protection Strategy Study

The Irish Coastal Protection Strategy Study (ICPSS) is a national study that was commissioned in 2003 with the objective of providing information to support decision making about how best to manage risks associated with coastal flooding and coastal erosion. The Study was completed in 2013 and provides strategic current scenario and future scenario (up to 2100) coastal flood hazard maps and strategic coastal erosion maps for the national coastline. This major study provides invaluable and essential information required to inform policy in this area, particularly for local authorities in relation to the proper planning and development of coastal areas.

The Irish Coastal Wave and Water Level Modelling Study (ICWWS) was commissioned in 2011 with the objective of providing information to facilitate the assessment of flood risk due to wave overtopping around the coast of Ireland. The Study was completed in 2013 and provides detailed nearshore water level and wave condition information for the current and future scenario (up to 2100) at 63 locations identified as being susceptible to wave overtopping and where this may contribute to significant coastal flooding both now and in the future.

In 2018, the OPW commissioned a further study to update the extreme water level and wave analysis completed as part of the ICPSS and ICWWS by incorporating any additional data that is now available from tide gauges and records of more recent storm events. The objectives of this study are to update the predicted extreme water levels for all previous ICPSS coastal locations and the predicted extreme water level and wave climate information for the areas identified as being susceptible to wave overtopping, under current and multiple future scenarios. The study also includes the development of detailed models of specified major flood relief scheme locations to inform the detailed assessment and design of these schemes.

14.1.5 Catchment Flood Risk Assessment and Management (CFRAM) Programme

Completed in 2018, the objectives of the CFRAM Programme were to:

- identify and map the existing and potential future flood hazard and flood risk in the areas at potentially significant risk from flooding, called Areas for Further Assessment (AFAs), as identified through the PFRA,
- identify feasible structural and non-structural measures to effectively manage the assessed risk in each of the AFAs, and
- prepare a set of Flood Risk Management Plans (FRMPs), and associated Strategic Environmental and Habitats Directive (Appropriate) Assessments that set out the proposed feasible measures and actions to manage the flood risk in the identified areas and their river catchments.

The CFRAM Programme covered those areas, in each county, where, based on initial analysis, the flood risk was determined to be potentially significant. The 300 communities studied are home to two thirds of the population and 80% of properties potentially at risk in Ireland from rivers and seas, the primary source of flooding in Ireland. Ninety of these communities are coastal areas. While the CFRAM Programme assessed flood risk in all our large urban areas, approximately one quarter of communities assessed had populations of less than 500 people and half had less than 2,000 people.

In consultation with Local Authorities, the OPW embarked on extensive and detailed analysis to fully assess the risk of flooding in each of these areas. This was completed through six CFRAM Projects covering 29 River Basins and other location-specific projects. To ensure best practice and a national consistency of approach, the OPW established a National Technical Coordination Group that established common standards, methods and approaches to assessing and planning for flood risk management.

Through the CFRAM Programme and other location-specific projects, the OPW has assessed and mapped the flood extents, hazard and risk for the 300 communities assessed for a range of flood events from frequent, minor flood events (1 in 10 year event) up to, very rare (1 in 100 year event) to extreme events (1 in 1,000 year event). The flood maps were developed for two future scenarios taking account of the potential impacts of climate change as well as for current conditions.

These maps and assessments provide valuable information for the OPW, local authorities and other sectors in planning for adaptation against increasing flood risks due to climate change, as well as informing future planning decisions, emergency response planning and helping communities and people to plan for and respond to a flood event.

14.1.6 Planning System & Flood Risk Management – Guidelines for Planning Authorities 2009[1]

These national guidelines introduce comprehensive mechanisms for the incorporation of flood risk identification, assessment and management into the planning process. Implementation of the Guidelines will be achieved through actions at the national, regional, local authority and site-specific levels.

At city and county level these guidelines require:

- Planning authorities to introduce flood risk assessment as an integral and leading element of their development planning functions under the Planning Code and at the earliest practicable opportunity in line with the requirements of these Guidelines.
- The new flood risk assessment system to be aligned with the existing Strategic Environmental Assessment (SEA) process introducing processes for identifying flood risk and determining what flood risk assessment is required and carrying out such assessments similar to the overall system for screening and scoping under the SEA process.
- City and county development plans to establish the flood risk assessment requirements for their functional areas including other planning authorities and any local area plans (LAP) which may be supplemented by more detailed site-specific flood risk assessment required to comply with these Guidelines.
- Planning authorities to assess planning applications for development in accordance with the provisions of these Guidelines following the guidance of their own or any OPW Strategic Flood Risk Assessment and the application of the sequential approach and, if necessary, the Justification Test required by these Guidelines.
- Planning authorities to ensure that development is not permitted in areas of flood risk, particularly floodplains, except where there are no suitable alternative sites available in areas at lower risk that are consistent with the objectives of proper planning and sustainable development. Where such development has to take place, in the case of urban regeneration for example, the type of development has to be carefully considered and the risks should be mitigated and managed through location, layout and design of the development to reduce flood risk to an acceptable level.
- Planning authorities to ensure that only developments consistent with the overall policy and technical approaches of these Guidelines will be approved and permission will be refused where flood issues have not been, or cannot be, addressed successfully and where the presence of unacceptable residual flood risks to the development, its occupants or users and adjoining property remains.

[1] Including associated Circulars and Technical Appendices

14.1.7 Climate Change Sectoral Adaptation Plan for Flood Risk Management

Under Section 5 of the Climate Action and Low Carbon Development Act, 2015, the Minister for Communications, Climate Action and Environment published the National Adaptation Framework (NAF) in January 2018 (DCCAE, 2018), which complements the National Mitigation Plan published in July 2017 (DCCAE, 2017). The NAF specifies the national strategy for the application of adaptation measures in different sectors and by local authorities in their administrative areas in order to reduce the vulnerability of the State to the negative effects of climate change and to avail of any positive effects that may occur. The NAF identifies Flood Risk Management as one of the priority sectors, and the Office of Public Works (OPW) as the Lead Department for the adaptation plan for the sector.

The purpose of the Climate Change Sectoral Adaptation Plan for Flood Risk Management is to:

- outline the potential impacts of climate change on flooding and flood risk management in Ireland;
- identify the objectives for an effective and sustainable approach to adaptation as part of flood risk management for the future,
- promote a coordinated approach to adaptation:
  - within the flood risk management sector and sustainable flood risk management measures in other sectors, and,
  - across the policies and actions of other Sectors including Local Authorities, and,
- recommend any further actions required to meet the objectives for adaptation.

This plan sets out a methodology for dealing with adapting to flood risk, which is centred particularly on prevention, protection, preparedness and good data collection and flood risk assessment.

14.1.8 Planning and Development Act 2000 (as amended)

The Planning & Development Act set out that the development plan may include objectives for:

"Carrying out flood risk assessment for the purpose of regulating, restricting and controlling development in areas at risk of flooding (whether inland or coastal)".

14.2 Strategic Flood Risk Assessment

This plan is accompanied by a Strategic Flood Risk Assessment (SFRA), which has been prepared and informed by '*The Planning System and Flood Risk Management – Guidelines for Planning Authorities*' (Appendix 8).

The purpose of the SFRA primarily is to provide an assessment of all types of flood risk to inform land-use planning decisions in the County Development Plan. The SFRA enables the local authority to undertake the sequential approach, including the justification test, allocate appropriate sites for development and identify how flood risk can be reduced as part of the development plan process. The SFRA can also be used to assist other planning decisions (e.g. development management) however in any instance a site-specific flood risk assessment may be required when assessing a planning application for development.

The SFRA has identified flooding and/or surface water management issues related to the County that may warrant further investigation at the appropriate lower level plan or planning application levels, and also to suggest objectives to be integrated into the County Development Plan that will contribute towards both flood risk management in the County and compliance with the Flood Risk Management Guidelines.

The County Wicklow SFRA contained within the appendices of this Development Plan, provides information on various flood risk indicators that occur within the County. It also provides information on the three types of flood zones, the SFRAs for each settlement within the County, the sequential approach and justification test to be considered and implemented at the development management stage.

14.3 Flood Risk Management Strategy

Flood Risk Management Approach

The Council shall adopt a comprehensive risk-based planning approach to flood management to prevent or minimize future flood risk. In accordance with the Flood Risk Management Guidelines, the avoidance of certain types of development in areas where flood risk has been identified shall be the primary response. Proposals for mitigation and management of flood risk will only be considered where avoidance is not possible and where development can be clearly justified with the guidelines' *Justification Test*. Flood management should have regard to surface water, groundwater, drinking water supply, flood plains and water and wastewater infrastructure.

Where flood risk may be an issue for any proposed development, a flood risk assessment should be carried out that is appropriate to the scale and nature of the development and the risks arising. This shall be undertaken in accordance with the Flood Risk Management Guidelines.

With respect to Urban Storm Water Drainage and water bearing infrastructure, local authorities maintain the road and urban storm-water drainage infrastructure within their areas to help ensure that urban runoff can drain into drainage networks for storage and/or removal from potential risk areas, while Irish Water is responsible for combined sewerage systems (carrying foul and storm water), and for maintaining the existing capacity of these systems, which can drain urban areas, and for managing new connections and inflows.

Water-bearing infrastructure, including piped networks and water retention structures, can potentially cause flooding in the event of failure or blockage. Piped networks might include water supply pipes or sewerage systems, while water-retention structures might include dams and embanked reservoirs and raised canals. The owners and operators of the infrastructure are responsible for managing the risk of flooding from that infrastructure.

Statutory Instrument SI No. 122 of 2010, requires that relevant infrastructure owners must assess the flood risk related to their assets and, where significant, identify measures to manage the risk in line with the requirements of the EU 'Floods' Directive, with a review of the risk to be carried out every six years.

14.4 Flood Risk Management Objectives

CPO 14.01 To support the implementation of recommendations in the OPW Flood Risk Management Plans (FRMPs), including planned investment measures for managing and reducing flood risk.

CPO14.02 To support and facilitate flood management activities, projects or programmes as may arise, including but not limited to those relating to the management of upstream catchments and the use of 'natural water retention' measures[2], **and** ensure each flood risk management activity is examined to determine actions required to embed and provide for effective climate change adaptation as set out in the Climate Change Sectoral Adaptation Plan for Flood Risk Management applicable at the time.

CPO14.03 To recognise the concept of coastal evolution and fluvial flooding as part of our dynamic physical environment, and adopt an adaptive approach to working with these natural processes. The focus of a flood management strategy should not solely be driven by conservation of existing lands; it should recognise that marshes, mud flats and other associated eco-systems evolve and degenerate, and appropriate consideration should be given to the realignment of defences and use of

[2] Natural Water Retention Measures (NWRM) are multi-functional measures that aim to protect water resources and address water-related challenges by restoring or maintaining ecosystems as well as natural features and characteristics of water bodies using natural means and processes.

managed retreat and sacrificial flood protection lands to maintain such habitats as part of an overall strategy.

CPO 14.04 To ensure the County's natural coastal defences (beaches, sand dunes, salt marshes and estuary lands) are protected and to ensure that their flood defence/management function is not put at risk by inappropriate works or development.

CPO14.05 To continue to work with the OPW and other agencies to deliver Flood Defence Schemes in the County as identified in current and future FRMPs, and in particular:

- Avoca River (Arklow) Flood Defence Scheme;
- Avoca River (Avoca) Flood Defence Scheme;
- Low cost works in accordance with the OPW's Minor Works Scheme;
- Coastal Protection Projects, where funding allows.

CPO 14.06 To implement the 'Guidelines on the Planning System and Flood Risk Management' (DoEHLG/OPW, 2009).

CPO 14.07 To prepare new or update existing flood risk assessments and flood zone maps for all zoned lands within the County as part of the review process for Local Area Plans, zoning variations and Small Town Plans, where considered necessary.

CPO 14.08 The zoning of land that has been identified as being at a high or moderate probability of flooding (flood zones A or B) shall be in accordance with the requirements of the Flood Risk Management Guidelines and in particular the 'justification test for development plans' (as set out in Section 4.23 and Box 4.1 of the guidelines).

CPO 14.09 Applications for new developments or significant alterations/extension to existing developments **in an area at risk of flooding** shall comply with the following:

- Follow the 'sequential approach' as set out in the Flood Risk Management Guidelines.
- An appropriately detailed flood risk / drainage impact assessment will be required with all planning applications, to ensure that the development itself is not at risk of flooding and the development does not increase the flood risk in the relevant catchment (both up and down stream of the application site), taking into account all sources of flooding.
- Restrict the types of development permitted in Flood Zone A and Flood Zone B to that which are 'appropriate' to each flood zone, as set out in Tables 3.1 and 3.2 of the guidelines for Flood Risk Management (DoEHLG/OPW, 2009, as amended) unless the 'plan making justification test' has been applied and passed.
- Where a site has been subject to and satisfied the 'plan making justification test' development will only be permitted where a proposal complies with the 'Justification Test for Development Management', as set out in Box 5.1 of the Guidelines.
- Flood Risk Assessments shall be in accordance with the requirements set out in the Guidelines and the SFRA.

Where flood zone mapping **does not indicate a risk of flooding** but the planning authority is of the opinion that flood risk may arise or new information has come to light that may alter the flood designation of the land, an appropriate flood risk assessment will be required to be submitted by an applicant for planning permission and the sequential approach shall be applied as the 'plan making justification test' will not be satisfied.

CPO 14.10 To prohibit development in river flood plains or other areas known to provide natural attenuation for floodwaters except where the development can clearly be justified with the Flood Risk Management Guidelines 'Justification Test'.

CPO 14.11 To limit or break up large areas of hard surfacing in new developments and to require all surface car parks to integrate permeability measures such as permeable paving.

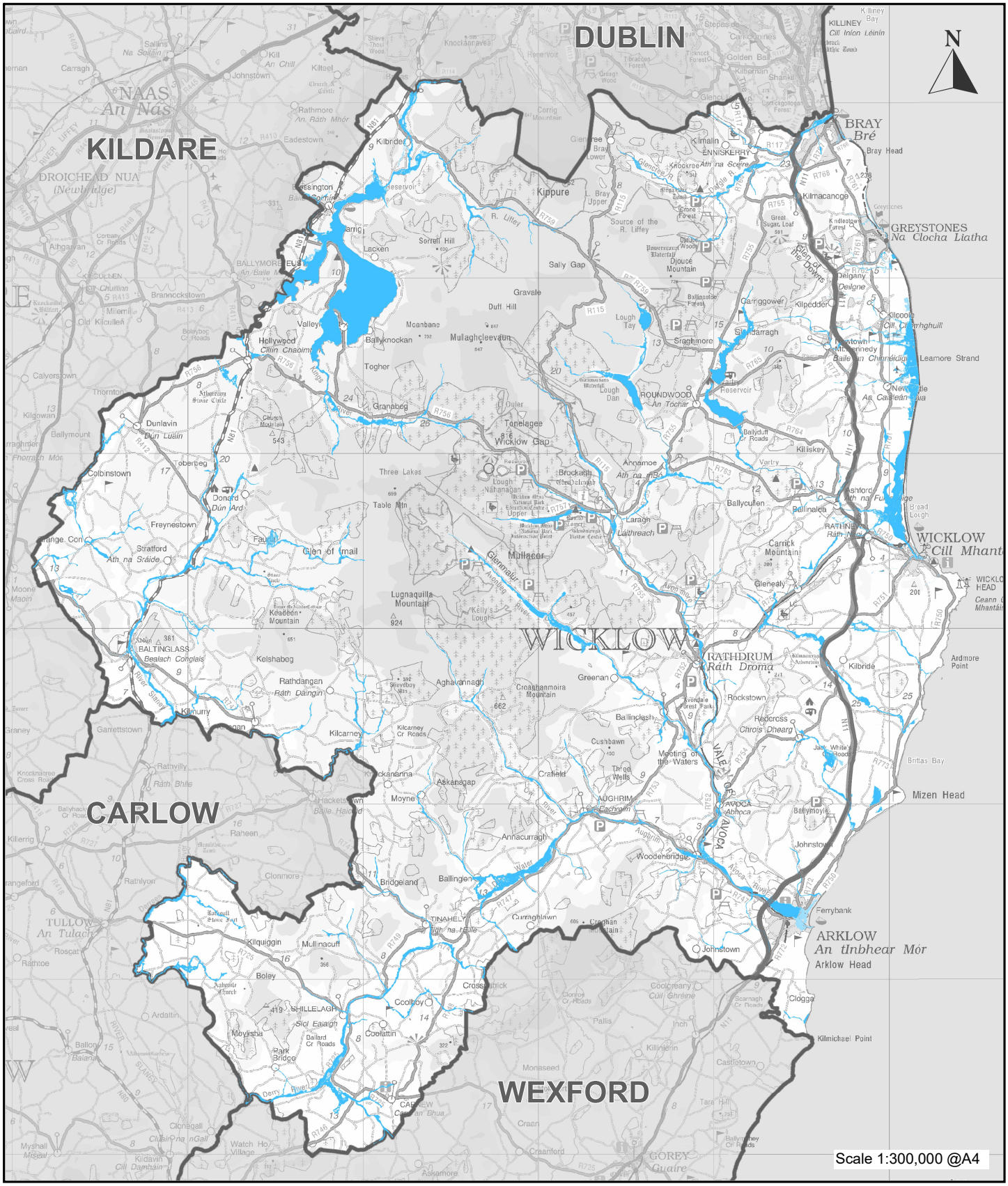
CPO 14.12 Excessive hard surfacing shall not be permitted for new, or extensions to, residential or commercial developments and all applications will be required to show that sustainable drainage techniques have been employed in the design of the development.

CPO 14.13 Ensure the implementation of Sustainable Urban Drainage Systems (SUDS) in accordance with the Wicklow County Council SuDS Policy to ensure surface water runoff is managed for maximum benefit. In particular to require proposed developments to meet the design criteria of each of the four pillars of SuDS design; Water Quality, Water Quantity, Amenity and Biodiversity.

CPO 14.14 Underground tanks and storage systems shall be permitted as a last resort only where it can be demonstrated the other more sustainable SuDS infrastructure measures are not feasible. In any case underground tanks and storage systems shall not be permitted under public open space, unless there is no other feasible alternative.

CPO 14.15 To promote the use of green infrastructure, such as swales and wetlands, where feasible as landscape features in new development to provide storm / surface runoff storage and reduce pollutants, as well as habitat, recreation and aesthetic functions.

CPO 14.16 For developments adjacent to all watercourses or where it is necessary to maintain the ecological or environmental quality of the watercourse, any structures (including hard landscaping) must be set back from the edge of the watercourse in accordance with the guidelines in 'Planning for Watercourses in the Urban Environment' by Inland Fisheries Ireland.



Flood Management Map No. 14.01

Disclaimer

These Indicative Flood Zones were based on information available at the time of drafting and amending this plan. Any new data and analysis carried out after this date has not been integrated into this map but should be used in conjunction with this map for development proposals. All information may be substantially altered in light of future data and analysis.

Full Disclaimer is included in SFRA

WICKLOW
ENDLESS OPPORTUNITIES

Legend

Indicative Flood Zones

Flood Zone A: High probability of flooding -

Where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding).

Flood Zone B: Moderate probability of flooding -

Where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding).

DRAFT WICKLOW COUNTY DEVELOPMENT PLAN 2021-2027

Wicklow County Council
Planning Department