

South Western CFRAM Study

Preliminary Options Report UoM 21

July 2016

The Office of Public Works

South Western CFRAM Study

Preliminary Options Report UoM 21

July 2016

The Office of Public Works

Jonathan Swift Street
Trim
Co. Meath

USER NOTICE

Please read carefully the following statements and conditions of use of the data, contained in this report. Accessing the information and data denotes agreement to, and unconditional acceptance of, all of the statements and conditions.

I have read in full, understand and accept all of the above notes and warnings concerning the source, reliability and use of the data available in this report.

I agree that the Commissioners of Public Works in Ireland have the absolute right to reprocess, revise, add to, or remove any data made available in this report as they deem necessary, and that I will in no way hold the Commissioners of Public Works in Ireland liable for any damage or cost incurred as a result of such acts.

I will use any such data made available in an appropriate and responsible manner and in accordance with the above notes, warnings and conditions.

I understand that the Commissioners of Public Works in Ireland do not guarantee the accuracy of any data made available, or any site to which these pages connect and it is my responsibility to independently verify and quality control any of the data used and ensure that it is fit for use.

I further understand that the Commissioners of Public Works in Ireland shall have no liability to me for any loss or damage arising as a result of my use of or reliance on this data.

I will not pass on any data used to any third party without ensuring that said party is fully aware of the notes, warnings and conditions of use.

I accept all responsibility for the use of any data made available that is downloaded, read or interpreted or used in any way by myself, or that is passed to a third party by myself, and will in no way hold the Commissioners of Public Works in Ireland liable for any damage or loss howsoever arising out of the use or interpretation of this data.

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	December 2015	TD / RM / JD	B. O'Connor	F. McGivern	Draft Issue
B	March 2016	T. Donovan	B. O'Connor	F. McGivern	Draft Issue
C	May 2016	T Donovan	B O'Connor	F McGivern	Draft Final
D	June 2016	T. Donovan	B. O'Connor	F. McGivern	Final
E	July 2016	J Desmond	T Donovan	F McGivern	Final

USER NOTICE

Please read carefully the following statements and conditions of use of the data, contained in this report. Accessing the information and data denotes agreement to, and unconditional acceptance of, all of the statements and conditions.

I have read in full, understand and accept all of the above notes and warnings concerning the source, reliability and use of the data available in this report.

I agree that the Commissioners of Public Works in Ireland have the absolute right to reprocess, revise, add to, or remove any data made available in this report as they deem necessary, and that I will in no way hold the Commissioners of Public Works in Ireland liable for any damage or cost incurred as a result of such acts.

I will use any such data made available in an appropriate and responsible manner and in accordance with the above notes, warnings and conditions.

I understand that the Commissioners of Public Works in Ireland do not guarantee the accuracy of any data made available, or any site to which these pages connect and it is my responsibility to independently verify and quality control any of the data used and ensure that it is fit for use.

I further understand that the Commissioners of Public Works in Ireland shall have no liability to me for any loss or damage arising as a result of my use of or reliance on this data.

I will not pass on any data used to any third party without ensuring that said party is fully aware of the notes, warnings and conditions of use.

I accept all responsibility for the use of any data made available that is downloaded, read or interpreted or used in any way by myself, or that is passed to a third party by myself, and will in no way hold the Commissioners of Public Works in Ireland liable for any damage or loss howsoever arising out of the use or interpretation of this data.

Information class: Standard

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

Appendices

Appendix A. Estimate of Costs	84
Appendix B. Drawings of Potential FRM Options	85
Appendix C. Draft SEA Options Appraisal Report	86
Appendix D. Draft Screening for Appropriate Assessment under the Habitats Directive	87
Appendix E. Climate Change Adaptability	88
Appendix F. Multi Criteria Assessment	89

Appendix C. Draft SEA Options Appraisal Report



South Western RBD CFRAM Study

SEA Options Appraisal Study
Unit of Management 21

June 2016

The Office of Public Works

South Western RBD CFRAM Study

SEA Options Appraisal Study
Unit of Management 21

June 2016

The Office of Public Works

Jonathan Swift Street,
Trim,
County Meath.

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	22nd January 2016	N. Roche R. Hallissey	P. Kelly	P. Kelly	Issue for Client Review
B	21 st June	N. Roche	B. O'Connor	F. McGivern	Final for consultation

Please read carefully the following statements and conditions of use of the data, contained in this report. Accessing the information and data denotes agreement to, and unconditional acceptance of, all of the statements and conditions.

I have read in full, understand and accept all of the above notes and warnings concerning the source, reliability and use of the data available in this report.

I agree that the Commissioners of Public Works in Ireland have the absolute right to reprocess, revise, add to, or remove any data made available in this report as they deem necessary, and that I will in no way hold the Commissioners of Public Works in Ireland liable for any damage or cost incurred as a result of such acts.

I will use any such data made available in an appropriate and responsible manner and in accordance with the above notes, warnings and conditions.

I understand that the Commissioners of Public Works in Ireland do not guarantee the accuracy of any data made available, or any site to which these pages connect and it is my responsibility to independently verify and quality control any of the data used and ensure that it is fit for use.

I further understand that the Commissioners of Public Works in Ireland shall have no liability to me for any loss or damage arising as a result of my use of or reliance on this data.

I will not pass on any data used to any third party without ensuring that said party is fully aware of the notes, warnings and conditions of use.

I accept all responsibility for the use of any data made available that is downloaded, read or interpreted or used in any way by myself, or that is passed to a third party by myself, and will in no way hold the Commissioners of Public Works in Ireland liable for any damage or loss howsoever arising out of the use or interpretation of this data.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

Legal Disclaimer

This report is subject to the limitations and warranties contained in the contract between the commissioning party (Office of Public Works) and Mott MacDonald Ireland.

Contents

Chapter	Title	Page
	Executive Summary	i
1	Introduction	1
1.1	General	1
1.2	Overview of the South Western River Basin District	2
1.3	Purpose and Structure of this Report	4
2	Flood Risk Management Options	6
2.1	Introduction	6
2.2	Evaluating the Effectiveness of Flood Risk Management Options	7
3	Strategic Environmental Assessment	10
3.1	Introduction	10
3.2	Overview of the SEA Process	10
3.3	SEA Objectives, Sub-Objectives and Targets	12
3.4	Assessment of Alternatives	14
4	Appropriate Assessment	16
4.1	Introduction	16
4.2	Habitats Directive Screening (for Appropriate Assessment)	16
5	Bantry	17
5.1	Flood Risk	17
5.2	Viable Flood Risk Management Options	18
5.3	Key Environmental Sensitivities	18
5.4	Environmental Assessment	20
5.5	Preferred Flood Risk Management Option	22
6	Kenmare	23
6.1	Flood Risk	23
6.2	Viable Flood Risk Management Options	24
6.3	Key Environmental Sensitivities	25
6.4	Environmental Assessment	27
6.5	Preferred Flood Risk Management Option	3
7	Castletownbere	4
7.1	Flood Risk	4
7.2	Viable Flood Risk Management Options	4
7.3	Key Environmental Sensitivities	5

7.4	Environmental Assessment	5
7.5	Preferred Flood Risk Management Option	7
8	Conclusions and Next Steps	8
8.1	Conclusions	8
8.2	Next Steps	8
	Appendices	9
	Appendix A. AFA Option Drawings	10
	Appendix B. SEA Scoring Matrix	18

Executive Summary

The Office of Public Works (OPW) is undertaking six catchment-based flood risk assessment and management (CFRAM) studies to identify and map areas across Ireland which are at existing and potential future risk of flooding. Mott MacDonald Ireland Ltd. has been appointed by the OPW to assess flood risk and develop flood risk management options in the South Western River Basin District. This SEA Options Appraisal Report is one of a series of reports being produced as part of the South Western Catchment Flood Risk Assessment and Management Study (SW CFRAM Study). As part of the strategic environmental assessment (SEA) process to inform the development of the Flood Risk Management Plans this report has been prepared to assess the options to manage flood risk in Unit of Management 21 (the Dunmanus / Bantry / Kenmare Bay Catchment).

The findings from this assessment of the flood risk management options against the objectives defined in the previously prepared SEA Scoping Report will be integrated into the decision-making process for the selection of the preferred measures and options to manage flood risk in Unit of Management 21. These measures and options will form the basis for the Flood Risk Management Plan for this Unit of Management.

The strategic environmental assessment has identified that the preferred alternatives are as set out below.

Table 1.1: Preferred Flood Risk Management Options (UoM 21)

AFA	Preferred Flood Risk Management Option
Bantry	Option 1 (Fluvial and Tidal Flood Defences)
Kenmare	Option 3 (Conveyance and Flood Defence works)
Castletownbere	Option 1 (Flood Defences)

These findings will be integrated into the overall multi-criteria analysis for the identification of the overall preferred flood risk management option in each AFA.

Once the preferred flood risk management option has been identified in each AFA the Draft Flood Risk Management Plan will be prepared. The next stage (Stage 3) of the strategic environmental assessment process involves the identification of the environmental impacts (including where appropriate mitigation measures) and recommending monitoring for the evaluation of the plan.

1 Introduction

1.1 General

Flood risk management in Ireland has historically focused on land drainage schemes for the improvement of agricultural land. The 1945 Arterial Drainage Act established a national drainage authority (the Office of Public Works) with the remit of implementing a national arterial drainage programme. The Arterial Drainage Act was amended in 1995 to include for the protection of urban areas suffering from flooding.

In 2004, the Irish Government adopted a new National Flood Policy for Ireland which shifted the emphasis in addressing flood risk away from arterial drainage and targeted towards the protection of agriculture and cities /towns liable to serious flooding and towards a waterbody catchment-based flood risk assessment (a similar catchment-based management approach to that already being implemented under the Water Framework Directive 2000/60/EC).

In 2007, the Floods Directive [2007/60/EC] was published which requires the establishment of a framework of measures to reduce the risks of flood damage. The Floods Directive was transposed into Irish law by the European Communities (Assessment and Management of Flood Risks) Regulations, 2010 (S.I. No. 122 of 2010). The Regulations identify the Office of Public Works (OPW) as the lead agency in implementing flood management policy in Ireland.

Catchment Flood Risk Assessment and Management (CFRAM) Studies

For the purpose of delivering on the components of the National Flood Policy and on the requirements of the European Union Floods Directive, the OPW, in conjunction with Local Authorities and stakeholders, is conducting a number of Catchment Flood Risk Assessment and Management (CFRAM) Studies. These studies are the core activity from which medium to long-term strategies for the reduction and management of flood risk in Ireland will be achieved.

The overarching objectives of the CFRAM Studies are to:

- Identify and map the existing and potential future flood hazard within the study area;
- Assess and map the existing and potential future flood risk within the study area;
- Identify viable structural and non-structural options and measures for the effective and sustainable management of flood risk within the study area; and
- Prepare Flood Risk Management Plans (FRMPs) setting out recommendations to manage the existing flood risk and also the potential future flood risk which may increase due to climate change, development, and other pressures that may arise in the future. FRMPs will set out policies, strategies, measures and actions that should be pursued by the relevant bodies (including the OPW, Local Authorities and other Stakeholders), to achieve the most cost-effective and sustainable management of existing and potential future flood risk within the study area, taking

account of environmental plans, objectives and legislative requirements and other statutory plans and requirements¹.

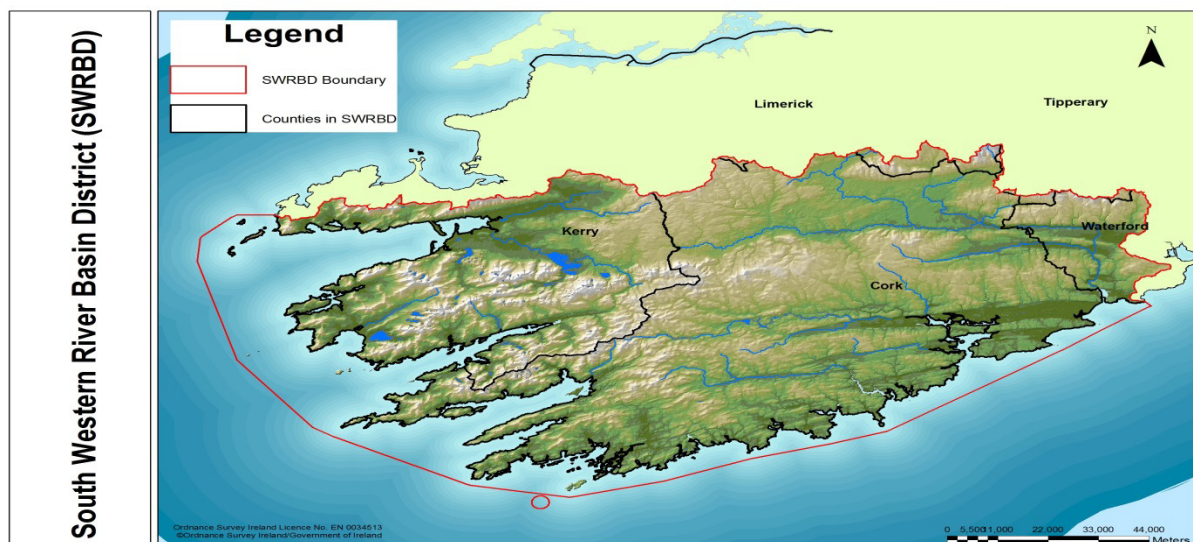
The OPW has commissioned a CFRAM study for each of Ireland's seven River Basin Districts (RBDs)².

1.2 Overview of the South Western River Basin District

The South Western River Basin District (SWRBD) covers an area of approximately 11,160 km². The study area of the SWRBD includes most of county Cork, large parts of counties Kerry and Waterford along with small parts of the counties of Tipperary and Limerick. The study area contains over 1,800 km of coastline along the Atlantic Ocean and the Celtic Sea.

In total, six Local Authorities administer the regions within the SWRBD: Cork County Council, Cork City Council, Kerry County Council, Waterford City and County Council, Tipperary County Council and Limerick County Council. Much of the SWRBD is rural and the predominant land usage is agriculture. The SWRBD contains Cork City (pop. 119,418) and a number of other large towns such as Killarney (pop. 13,497), Mallow (pop. 7,864) and Bandon (pop. 6,640).

Figure 1-1 South Western River Basin District (SWRBD)



The South Western River Basin District is divided into the following five Units of Management (UoMs)³:

¹ The Floods Directive requires that Flood Risk Management Plans should take into account the particular characteristics of the areas they cover and provide for tailored solutions according to the needs and priorities of those areas, whilst promoting the achievement of environmental objectives laid down in Community legislation.

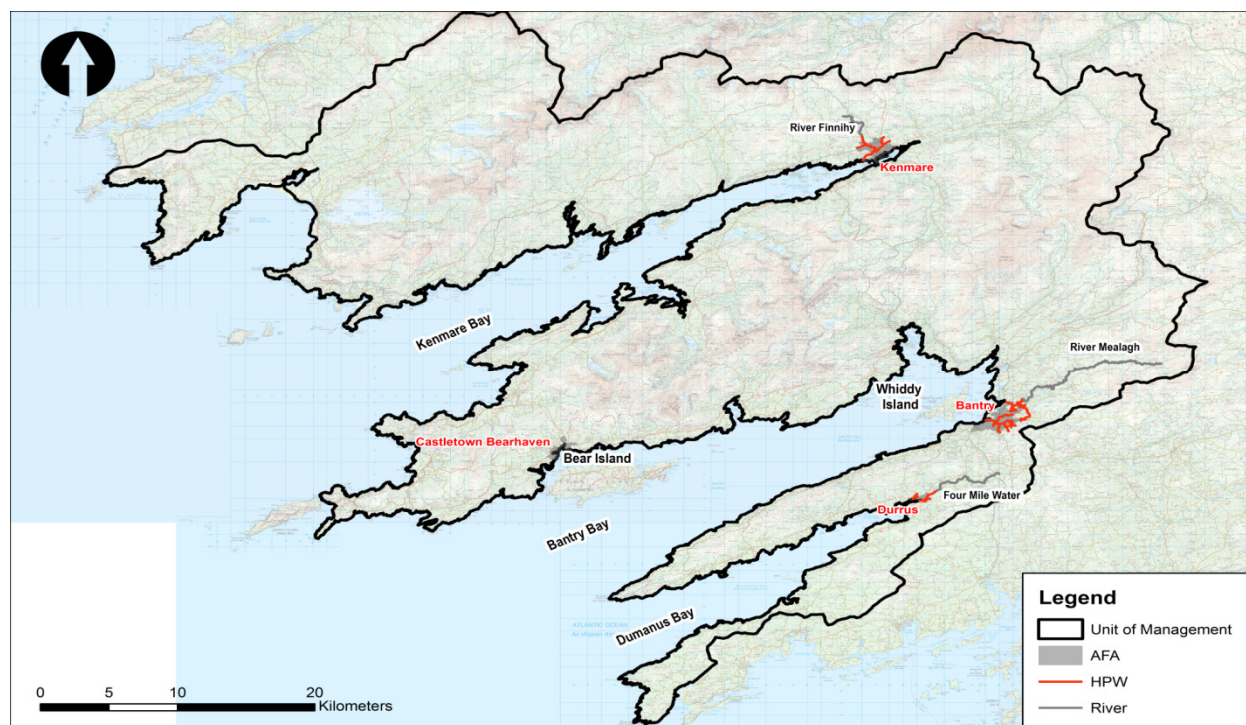
² River Basin Districts (RBDs) are the main units for the management of river basins and have been delineated by Member States under Article 3 of the Water Framework Directive (2000/60/EC). RBDs are areas of land and sea, made up of one or more neighboring river basins together with their associated groundwaters and coastal waters.

- The Munster Blackwater Catchment (UoM18);
- The Lee / Cork Harbour Catchment (UoM19);
- The Bandon / Skibbereen Catchment (UoM20);
- The Dunmanus / Bantry / Kenmare Bay Catchment (UoM21); and
- The Laune / Maine / Dingle Bay Catchment (UoM22).

Unit of Management 21, which forms part of the SWRBD covers an area of approximately 1,890 km². The Unit of Management is split between counties Cork and Kerry. The main rivers within UoM 21 are the Cummeragh, Inny and the Roughty. UoM 21 also includes a number of large lakes including Lough Currane and Derrianna Lough.

There are four Areas for Further Assessment (AFAs) within UoM21 which include Bantry and Castletownbere, Durrus and Kenmare. The development of viable options for Durrus is currently ongoing. The assessment for the Darrus AFA will be included at a later date. Associated with the AFAs is over 25km of high and medium priority watercourse. Based on historical flood evidence, the key flood mechanisms in the UoM are tidal and fluvial.

Figure 1-2 UoM 21



³ UoMs are representative of Hydrometric Area boundaries.

1.3 Purpose and Structure of this Report

1.3.1 Purpose

The CFRAM studies and Flood Risk Management Plans will be informed by a Strategic Environmental Assessment completed in accordance with the requirements of the SEA Directive (2001/42/EC), as transposed into Irish law through S.I. No. 435 and 436 of 2004 and S.I. No. 200 and 201 of 2011.

This report is a Strategic Environmental Assessment Options Appraisal Report and pertains to Unit of Management 21 (The Dunmanus / Bantry / Kenmare Bay Catchment) the South Western River Basin District.

The purpose of this report is to:

- a) Review the environmental aspects associated with the alternative flood risk management options under consideration. Flood risk management options consist(s) of one or, more commonly, a combination of flood risk management (FRM) methods;
- b) Determine the benefits and impacts of the alternative options assessed and mitigation/environmental enhancement measures where considered appropriate;
- c) Evaluate and rank the alternative options against the Strategic Environmental Assessment (SEA) Objectives, Indicators and Targets identified during the SEA Scoping Stage; and
- d) Identify the preferred flood risk management option from a strategic environmental assessment perspective.

1.3.2 Report Structure

Table 1.2: Report Structure

Chapter	Title	Purpose
1	Introduction	This chapter provides a broad background to the CFRAM Studies in the context of National Flood Policy and legislation. This section also sets out the purpose of the SEA Options Appraisal Study
2	Flood Risk Management Options	This chapter provides an overview of the processes associated with the identification of the preliminary flood risk management options and multi-criteria analysis.

Chapter	Title	Purpose
3	Strategic Environmental Assessment	This chapter provides an overview of the SEA process and the relationship between CFRAM and SEA with a particular emphasis on the flood risk management options evaluation stage.
5	Bantry	This chapter describes the flood risk management options for Bantry and the identification of the preferred option from an SEA perspective.
4	Appropriate Assessment	This chapter provides a brief overview of the AA process and the relationship between CFRAM and AA with a particular emphasis on the flood risk management options evaluation stage.
6	Kenmare	This chapter describes the flood risk management options for Kenmare and the identification of the preferred option from an SEA perspective.
7	Castletownbere	This chapter describes the flood risk management options for Castletownbere and the identification of the preferred option from an SEA perspective.
8	Conclusions and Next Steps	This chapter summarises the conclusion from the SEA Option Appraisal Study and the next steps in the SEA process.

2 Flood Risk Management Options

2.1 Introduction

A flood risk management option consists of one or, more commonly, a combination of flood risk management methods / measures. These methods/measures can be structural or non-structural in nature. The suitability of specific methods/measures needs to be reviewed on a case by case basis to ensure their appropriateness as all methods/measures may not be suitable in all circumstances.

2.1.1 Non Structural Measures

Non-structural measures can include one or a combination of some of the following;

Table 2.1: Non-Structural Measures

Measure	Description
Planning Control	This can include land-use development restrictions in statutory land-use plans (e.g. County/City Development Plans or Local Area Plans)
Building Regulations/Planning Conditions	This can involve requiring certain development/structures to be flood resilient through specified construction methods, building fabrics and uses (e.g. regulations relating to floor levels, flood-proofing, flood resilience, sustainable drainage systems, prevention of reconstruction or redevelopment in flood-risk areas, etc.);
Flood Forecasting	Flood forecasting is a means of providing advanced warning of an impending flood event. A reliable advance warning system allows protective measures to be put in place and protective actions to be carried out in advance of a flood event. These actions and measures can reduce the damage caused in a flood event.
Public Awareness	Public awareness measures include, for example; <ul style="list-style-type: none"> • Identification and disclosure of areas prone to flooding • Provision of information on the measures in place to provide advance warning of flooding • Establishment of methods to interface with the public and owners of vulnerable properties
Land-Use Management	Land Use Management includes strategies to control overland flow, such as improving agricultural and forestry practices in key catchment areas. Local natural flood management measures such as the creation of wetlands or forestry to retain overland flow could also be adopted.
Emergency Response Planning	Measures include strategic planning for the integrated response of the emergency services for flood risk and flood events

2.1.2 Structural Measures

Structural measures for flood risk management can include one or a combination of some of the following;

Table 2.2: Structural Measures

Measure	Description
Flood Storage	Measures could include provision of flood storage/retardation system
Flow Diversion	This could include full diversion of provision of a by-pass channel/flood relief

Measure	Description
	channel
Increased Conveyance	Measures could include in-channel works, floodplain earthworks, removal of constraints/constrictions or channel floodplain clearance.
Flood Defences	Flood defences can include such measures as walls, embankments or demountable defences
Improve Existing Defences	Existing defences could be repaired or gaps infilled.
Relocation of Properties	Existing properties could be relocated outside areas of flood risk
Localised Protection Works	This could involve such actions as minor raising of existing flood defences.

2.2 Evaluating the Effectiveness of Flood Risk Management Options

2.2.1 Overview

The effectiveness of each of the viable flood risk management option (FRM) is measured in terms of how it achieves a set of Flood Risk Management Objectives through a process of multi-criteria analysis (MCA). The objectives are split into a number of categories. These are;

- Technical;
- Economic;
- Social; and
- Environmental.

Some of the objectives within a particular category are further split into sub-objectives to provide clarity, particularly where individual objectives have multiple aspects associated with same.

2.2.2 Multi-Criteria Analysis Allocating Scores

Each sub objective has a basic requirement and an aspirational target associated with it. The basic requirement for each sub objective equates to a no change scenario. That is the status quo before the FRM option is adopted. The aspirational target in most cases is set to the highest achievement that is reasonably possible against the sub-objective in implementing the FRM option. The performance of each FRM option is measured against the basic and aspirational targets for each sub objective and assigned a score in accordance with the principles set out below.

Table 2.3: MCA Scoring

Option Performance	Score
Meets Aspirational Target	5
Partially Achieving Aspirational Target	Score in proportion to performance
Meeting Basic Requirement (No Change)	0
Just Failing Basic Requirement	Score in proportion to performance
Fully Failing Basic Requirement	-5

Option Performance	Score
Totally Failing Basic Requirement (Option Illegal or Totally Unacceptable)	-999

In the MCA the technical objectives measure if an option is robust in terms of operation. Higher scores are allocated to options that do not rely on mechanical, electrical or human intervention to operate effectively. Examples of such interventions include sluice gates, storm water over pumping, or erection of demountable barriers. The technical objectives also consider if the options can be constructed safely and if they can be managed effectively into the future.

The measurement of the performance of the options against the objective to avoid economic damage is measured in terms of the percentage of economic damage avoided by that option. When calculating the percentage reduction in damage for a particular option this is calculated relative to the total potential damages in the town. The economic objectives also measure the performance of the option in terms of reducing the risk to transportation routes, utility infrastructure and agricultural land.

The social objectives in the MCA include the reduction of flood risk to people, high vulnerability properties such as hospitals and fire stations and to social infrastructure and amenities. Under social objectives the MCA also measures the performance of the option to reduce the risk to local employment in relation to the number of non-residential properties at risk.

Under the environmental objectives the MCA measures the performance of the option as described below in accordance with the methodology as described in Chapter 3. This report has been prepared to describe the assessment of the FRM options against the environmental objectives.

Once all of the options have been analysed with reference to their performance against each of the sub-objectives the MCA score for each criteria can be calculated. This is done by multiplying the score for each sub objective by the Global and the Local Weighting and then by summing the weighted scores for all the sub objectives under that criterion.

Global and Local Weightings

In order to take account of the relative importance of some objectives in comparison other objectives, each sub-objective is given a Global Weighting. These global weightings are set at a national level and are the same across all of the CFRAM Studies. These weightings vary in value from 5 points to 30 points depending on their importance from a national perspective.

In order to take cognisance of the local perspective on the relative importance of objectives, each sub objective is also given a local weighting. Local weightings vary from 0 for not locally important to 5 for very important locally.

2.2.3 Multi-Criteria Analysis Overall Score

The **MCA Benefit Score** is calculated by adding the weighted score for the Economic, Social and Environmental Criteria together. This score represents the net benefits of the option.

The **Option Selection MCA Score** is calculated by adding the weighted scores of all the criteria together. This score includes the technical score and therefore includes all of the aspects that should be taken into account in considering the preferred option for a given location.

The **Total Construction Cost €** is the cost of the FRM option.

The **MCA Benefit – Cost Ratio** is calculated by dividing the **MCA Benefit Score** by the cost of the option. This is a numerical but non monetised ratio that indicates the overall benefits that can be delivered per euro of investment.

The **Economic Benefit €** is the cost of the damage avoided for the FRM Option.

The **Economic Benefit – Cost Ratio** is calculated by dividing the cost of the damage avoided by adopting the FRM Option by the cost of the option. This is the traditional method used by OPW in assessing the economic case for proceeding with a flood relief scheme. In general terms a flood relief scheme would be considered economically viable if the benefit cost ratio is greater than 1.

3 Strategic Environmental Assessment

3.1 Introduction

The management of flood risk will be achieved through the implementation of measures which are selected to achieve an acceptable balance of environmental, social, and technical factors. As part of the process to select the measures, the evaluation of the alternatives from an environmental perspective is a key step in the Strategic Environmental Assessment process.

3.2 Overview of the SEA Process

The SEA process involves six key stages as follows:

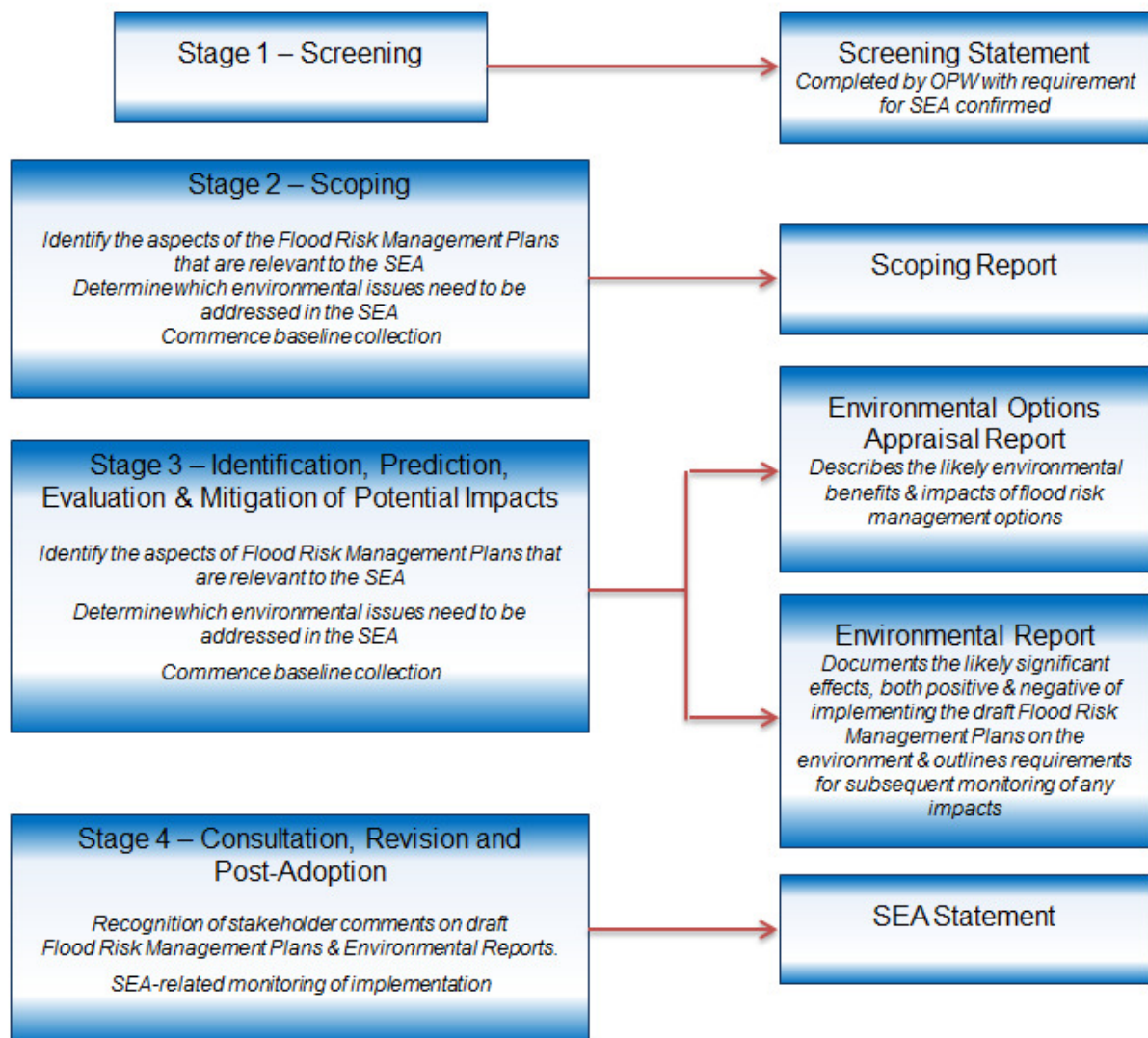
- **Screening** - the process of deciding whether the flood risk management plans would be likely to have significant environmental effects and as such would warrant a full SEA. The OPW conducted a screening assessment for the CFRAM studies in September 2011 which concluded that a full SEA is required.
- **Scoping** – Scoping determines the key environmental issues which are to be addressed in the Strategic Environmental Assessment. The scoping process set out a framework for the assessment of environmental effects resulting from a plan or programme and the generation of alternatives to ensure minimal environmental impact. The SEA process was completed in April 2015 following a consultation process with stakeholders.
- **Environmental Assessment and Environmental Report** – this is a key document in the SEA process as it outlines the likely significant effects on the environment of the Flood Risk Management Plan and recommends mitigation to address the significant adverse effects. The determination of the likely significant effects on the environment is based on a qualitative assessment under a series of Environmental Objectives. These environmental objectives are based on Environmental headings in Annex 2(f) of the *European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations, 2004 (S.I. 435 of 2004)* as amended and include the following aspects;
 - Biodiversity;
 - Population;
 - Human health;
 - Fauna;
 - Flora;
 - Soil;

- Water;
- Air;
- Climatic factors;
- Material assets;
- Cultural heritage including architectural and archaeological heritage;
- Landscape; and
- The inter-relationship of the above factors.

This document will also contain a history of the SEA process and how it was conducted with particular emphasis on stakeholder and public involvement;

- **Consultation on the Draft FRMP and SEA Environmental Report** – Consultation will be conducted with the relevant Environmental Authorities and also with the public. Both groups will be invited to make submissions in relation to the Draft Plan and Environmental Report. Submissions must be considered and the Environmental Report amended appropriately if deemed necessary;
- **SEA Statement** – From a legal and process perspective the production of the SEA Statement is the most important phase in the process. The function of the SEA Statement is to identify how the SEA process has influenced the plan. This requires careful scripting, particularly in the context of how differing opinions from consultees have been managed throughout the process. Another requirement of the SEA Statement is the inclusion of reasons for choosing the plan as adopted in light of the other reasonable alternatives considered.
- **Monitoring** - Monitoring requirements refer to the need to monitor the significant effects on the environment as a result of the implementation of the Flood Risk Management Plans. Monitoring begins with the adoption of the plan and continues for the duration of the plan.

Figure 3-1 Stages of SEA



3.3 SEA Objectives, Sub-Objectives and Targets

During the Scoping Stage, SEA objectives, sub-objectives and indicative targets were developed for each of the social and environmental criteria scoped into the study during this phase of the project. These objectives, sub-objectives and indicators have been developed to ensure that the SEA and multi-criteria flood risk management options appraisal focuses on those issues of relevance and significance to the

SWRBD. The SEA objectives align with the flood risk management objectives which have been developed on a national level through extensive consultation with stakeholders.

Table 3.1: SEA Objective, Sub-Objectives (and Targets)

Criteria	Objective	Sub-Objective	Example Indicator
Social	a Minimise risk to Human Health and life of resident	i Minimise risk to human health and life of residents	Number of residential properties at risk of flooding
		ii Minimise Risk to high vulnerability properties	Number of high vulnerability properties at risk from flooding (e.g. hospitals, health centres, nursing and residential homes)
	b Minimise risk to community	i Minimise risk to social infrastructure and amenity	(i) Number of social infrastructure assets at risk from flooding (e.g. educational institutions, fire and Garda stations, Bord Gáis facilities). (ii) Number/length of key strategic transport assets at risk of flooding.
		ii Minimise risk to local employment	Number of non-residential properties at risk from flooding.
Environmental	a Support the objectives of the WFD	Provide no impediment to the achievement of water body objectives and, if possible, contribute to the achievement of water body objectives.	Likelihood to impact on water body status elements: <ul style="list-style-type: none"> • Biology; • Physico-chemical; • Hydrology and morphology; • Priority substances and priority hazardous substances.
	b Support the objectives of the Habitats Directive and Birds Directive	Avoid detrimental effects to, and where possible enhance, Natura 2000 network, other protected sites, protected species and their key habitats, recognising relevant landscape features and stepping stones.	(i)Area of internationally designated sites at risk from flooding and assessment of likely impact. (ii)Reported conservation status of internationally designated sites relating to flood risk management.
	c Avoid damage to, and where possible enhance, the flora and fauna of the catchment	Avoid damage to or loss of, and where possible enhance, nature conservation sites and protected species or other known species of conservation concern	(i)Area of nationally designated sites at risk from flooding and assessment of likely impact, particularly where designated for Otter, White-clawed Crayfish or

			Freshwater Pearl Mussel (ii) Reported conservation status of nationally designated sites relating to flood risk management. (iii) Area/length of river within Freshwater Pearl Mussel sensitive areas where flood risk management actions are proposed, and assessment of likely impact.
d	Protect, and where possible enhance, fisheries resource within the catchment	Maintain existing and where possible create new fisheries habitat including the maintenance or improvement of conditions that allow upstream migration for fish species.	(i) Area of suitable habitat supporting salmonid and other fish species (ii) Number of upstream barriers
e	Protect, and where possible enhance, landscape character and visual amenity within the zone of influence	Protect, and where possible enhance, visual amenity, landscape protection zones and views into / from designated scenic areas within the zone of influence	(i) Length of waterway corridor qualifying as a landscape protection zone within urban areas (ii) Change of quality in existing scenic areas and routes (iii) Loss of public landscape amenities
f	Avoid damage and reduce risk of flooding to, or loss of, features, institutions and collections of cultural heritage importance and their setting	Avoid damage and reduce risk of flooding to, or loss of, features, institutions and collections of architectural value and their setting	Number of architectural assets at flood risk and assessment of impact on their setting.
	ii	Avoid damage and reduce risk of flooding to, or loss of, features, institutions and collections of archaeological value and their setting	Number of cultural heritage and archaeological assets at flood risk and assessment of impact on their setting.

Source: Mott MacDonald

3.4 Assessment of Alternatives

A key requirement for effective strategic environmental assessment is the evaluation of alternatives. The evaluation of alternatives from an SEA perspective is a key consideration in the determination of the best flood risk management option. This process has been described in detail in *Section 2.2 Evaluating the Effectiveness of Flood Risk Management Options*.

The Office of Public Works has published a Guidance Note under the National CFRAM Programme called *Option Appraisal and Multi-Criteria Analysis Framework (Revision C, April 2015)*. Appendix B to this guidance note includes a detailed description of each of the environmental objectives and the methodology for the environmental evaluation of the flood risk management options.

4 Appropriate Assessment

4.1 Introduction

Directive 2001/42/EC (Strategic Environmental Assessment Directive) requires that Strategic Environmental Assessment (SEA) must be carried out during the preparation stage of a Plan i.e. before the adoption of the Plan. When an Appropriate Assessment is being carried out for a plan it must be published concurrently/jointly with the SEA (as two separate reports). The outcomes and recommendations of each stage in the Appropriate Assessment process inform the Strategic Environmental Assessment and vice versa. It is important that the assessments be carried out in parallel in order that any environmental issues raised in each assessment can be considered as part of the other. Similarly, any mitigation or alternatives proposed must be addressed in both assessments.

Appropriate Assessment is specifically intended to determine the likely significant effects on European sites in view of their conservation objectives, and to ensure that no plan or project that would have adverse effects on the integrity of a European site is approved or adopted (unless in exceptional circumstances where the requirements of Article 6(4) of the Habitats Directive can be met). Appropriate assessment does not deal with all significant ecological issues of relevance to SEA, nor does it address all legal requirements in relation to the conservation and protection of ecological sites, habitats and species.

4.2 Habitats Directive Screening (for Appropriate Assessment)

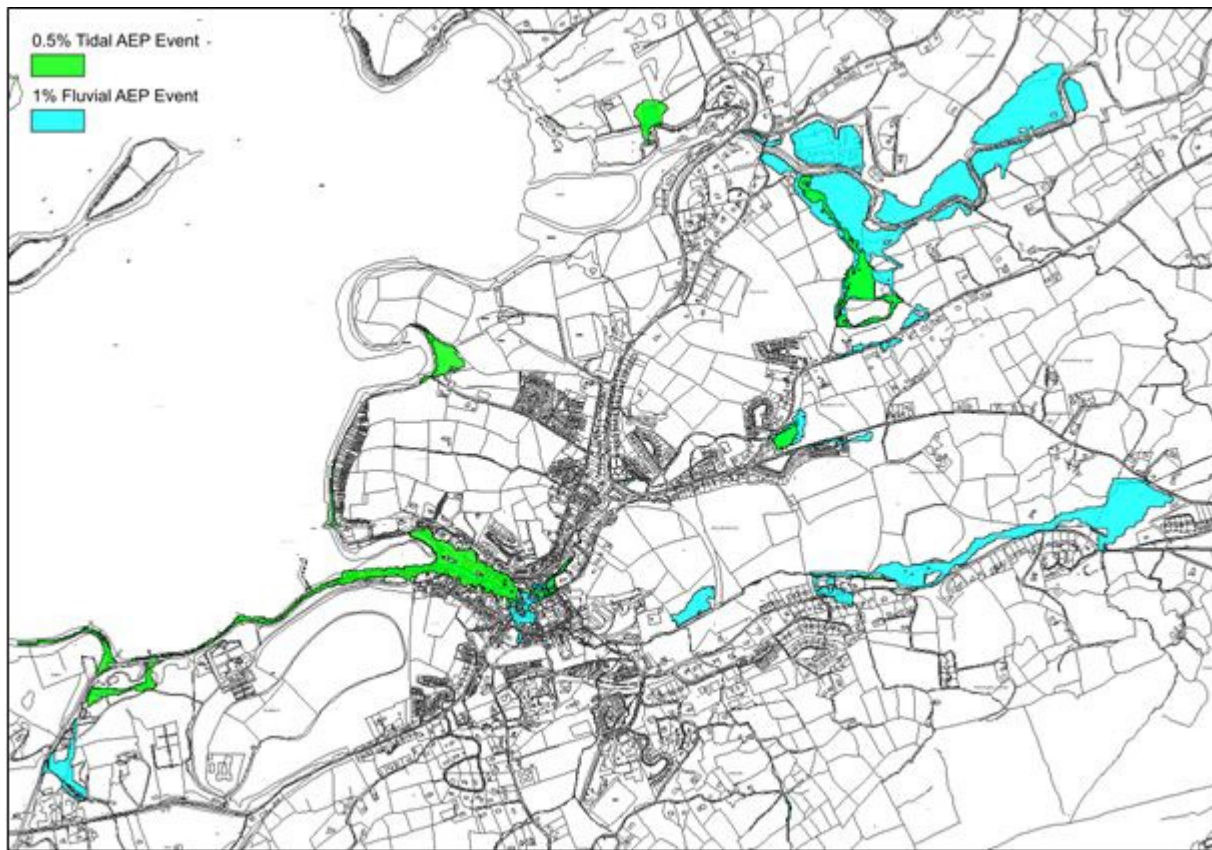
A separate draft Habitats Directive Screening (for Appropriate) Assessment has been developed to inform the Preliminary Options Report. The assessments have been included as an appendix to the Preliminary Options Reports.

5 Bantry

5.1 Flood Risk

Bantry is located at the mouth of the River Bantry in County Cork and is at risk of both fluvial and tidal flooding. The AFA and the existing flood risk are illustrated in Figure 5.1⁴.

Figure 5.1: Bantry Current Scenario Fluvial / Tidal Flood Extents



⁴ The Annual Exceedance Probability is the chance or probability of a flood event occurring annually and is usually expressed as a percentage. 1% AEP is event has a 1% chance of occurring in a year, so once in every 100 years

5.2 Viable Flood Risk Management Options

A number of viable flood risk management options were identified and modelled to determine their effectiveness and impact. It should be noted that due to the strategic level of the assessment, the locations in which viable options may be constructed within the AFA may change at detailed design stage if an option is progressed through as a scheme. These are described below and illustrated in **Appendix A** of this report. Multi-criteria analysis (MCA) for each option was undertaken to assess if a preferred option could be established on environmental grounds. The detailed breakdown of SEA scoring for the purpose of this appraisal is provided in **Appendix B** of this report.

Option 1 – Fluvial and Tidal Flood Defences- this option consider a combination of tidal and localised fluvial defence works within the town. The proposed flood defences fully achieves the required standard of protection for the 1% AEP fluvial event and the 0.5% AEP tidal event.

Option 2 – Fluvial Flood Defences and Tidal Barrage- this option considers the mitigation of flood risk through the construction of tidal barrage within the Inner Bantry Bay and localised fluvial protection works. In order for the tidal barrage to be an effective measure it must have sufficient storage within the barrage to accommodate the fluvial flows during the 0.5% AEP tidal event. To maximise the potential storage area for fluvial flows the barrage should be closed at the low tide preceding a tidal event. The proposed flood defences fully achieves the required standard of protection for the 1% AEP fluvial event and the 0.5% AEP tidal event. .

5.3 Key Environmental Sensitivities

- There are three distinct hydrological catchments in the Bantry AFA. The Mealagh catchment is located to the north of Bantry Town. The River Mealagh rises in the uplands of the Maughanaclea Hills and flows approximately 10km to the west before skirting around Drombrow Lough and entering the Bantry AFA.
- Bantry Town itself resides in the River Bantry catchment, the middle hydrologically distinct catchment in the Bantry AFA. The River Bantry is 2.2km long, rises near Ardnageehy More and flows along a fairly steep channel before passing into a tidally influenced culvert under Chapel Street in Bantry. The culvert passes under Bantry town centre and terminates in an outfall into Bantry Harbour. The River Bantry is joined by five tributaries: the Knocknaveagh, Sheskin East, Carrignagat, Dromleigh and Reenroul tributaries. The four tributaries to the south of Bantry River, the Knocknaveagh, Sheskin East, Carrignagat and Dromleigh, are all narrow and steep channels with many engineered sections, including culverts, weirs, bridges and aqueducts. The Reenroul Stream is the largest tributary to Bantry River and it has a shallower gradient of approximately 1 in 50. The lowest reach of the Reenroul is culverted and has a junction with Bantry River in the long culvert beneath Bantry Town.
- The third hydrological catchment in the Bantry AFA contains the Kilnaruane and Dromacoosane Rivers which flow through a predominantly rural area on the coast to the south of Bantry.

- Bantry Bay is a narrow tidal bay which extends from Dursey Island inland to Ballylicky and the Owvane River outfall. Bantry Bay has a number of islands which modify the tidal current and provide some protection to the mainland from incoming storm waves. These islands include Bear Island at Castletown Bearhaven and Whiddy Island at Bantry.
- The Mealagh catchment has been classified as 'good status' under the Water Framework Directive (WFD). Whereas the Bantry River and its tributaries are unclassified, they flow into the Inner Bantry Bay and this is classified as good status under the WFD. Bantry Inner Bay is also designated shellfish water under the European Communities (Quality of Shellfish Waters) Regulations 2006 as amended. Mussels are the main bivalve shellfish produced and harvested in the Inner Bantry Bay.
- The Bantry AFA boundary does not overlap with any Natura 2000 site boundary. There are no habitats of conservation importance noted within the AFA. There are a number of species of conservation importance within the AFA, these include otters, badgers, bats and large diversity of protected wildlife birds.
- The Mealagh catchment is considered a Margaritifera sensitive area (Freshwater Pearl Mussels). Freshwater Pearl Mussels (FPM) are identified as an Annex II species under the Habitats Directive.
- There is one significant polluting source (pumping station) within the 0.5% AEP tidal flood extent.
- Flooding is primarily caused by high tides entering the local drainage network and causing sewer flooding as well as river flooding from the Bantry Stream and tributaries. Bantry is prone to flash flooding from the numerous small steep rivers that flow through the town.
- Bantry is characterised as being particularly valuable in terms of its architecture. According to the Cork County Development (2014), the town is an architectural heritage area (ACA).
- According to the Cork County Development Plan (2014), Bantry AFA is located within an area characterised as "Rugged Ridge Peninsulas" landscape character type. The landscape type is deemed to be of very high value and very high sensitivity and of national value.
- Receptors at risk from fluvial flooding 1% AEP within the AFA:
 - 29 No. Residential properties
 - 119 No. Non-Residential properties
 - 1 No. High Vulnerability properties
 - 5 No. Society Amenity Sites
 - 23 No. NIA⁵H sites
- Receptors at risk from tidal flooding 0.5% AEP within the AFA:

⁵ NIAH- National Inventory of Architectural Heritage Site.

- 19 No. Residential properties
- 1 No. High Vulnerability properties
- 29 No. NIAH sites
- 5 No. RMP/RPS⁶ sites

5.4 Environmental Assessment

Table 5.1 below provides a summary of the potential impacts arising from the proposed options as determined through the SEA assessment. In addition Table 5.1 below also highlights the requirement for mitigation measures for each option under each social and environmental objective. Table 5.1 should be read in conjunction with the SEA scoring matrix shown below.

Table 5.1: Bantry Options Scoring Matrix- Social and Environmental Objectives

SEA Objectives	Do nothing		Option 1		Option 2	
Social Objectives	Impact	Mitigation required	Impact	Mitigation required	Impact	Mitigation required
Human Health and life of residents	O	N	O	N	O	N
High vulnerability properties	O	N	O	N	O	N
Social infrastructure and amenity	O	N	√	Y	√	Y
Risk to local employment	O	N	√√	Y	√√	Y
Environmental Objectives						
WFD Directive	X	Y	X	Y	XXX	Y
Birds and Habitats Directive	O	N	O	N	O	N
Flora and Fauna	O	N	XX	Y	XX	Y
Fisheries	O	Y	X	Y	XX	Y
Landscape	O	N	XX	Y	XXX	Y
Architectural Heritage	X	Y	√	Y	√	Y
Archaeological Heritage	X	Y	O	N	O	N

SEA Scoring Matrix

Score	Key	Description
+5	√√√	Achieving aspirational

⁶ The Record of Monument and Places (RMP) is a statutory list of all known archaeological monuments provided for in the National Monuments Acts. A (RPS) protected structure is a structure that a planning authority considers to be of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social or technical point of view.

+4	√√	target
+3	√√	Partly achieving aspirational target
+2	√	Exceeding minimum target
+1	√	
0	O	Meeting minimum target
-1	X	Just failing minimum target
-2	X	
-3	X X	Partly failing minimum target
-4	X X	
-5	XXX	Fully failing minimum target
-999.99	XX X	Unacceptable negative impact where feasible alternative exists

Having regard to the WFD objective, the construction of all options will result in temporary negative impacts on the water body status in the absence of appropriate mitigation. The pumping station located within the harbour is considered a significant polluting source in the AFA and Option 2 can contribute in achieving the objectives of the WFD by preventing recurring flooding to this significant polluting source. Option 1 however does not provide any additional protection to this source.

The Bantry AFA boundary does not overlap with any Natura 2000 site boundary. There are no habitats of conservation importance within the AFA and therefore there are no preference having regard to the Birds and Habitats Directive Objective. Both options include the construction of an embankment at Lahadane, there is potential for pollution at the FPM sensitive area within the Mealagh Catchment in the absence of mitigation. Targeted FPM surveys were conducted along Mealagh River and associated of minor tributaries entering the river from the south on the 18th February 2013. The survey found that no live mussels or dead shells were present. Impact on pearl mussel is therefore not likely.

There are a number of species of conservation importance within the AFA, these include otters, badgers, bats and large diversity of protected wildlife birds. All of the proposed options have the potential to cause disturbance to species of conservation concern through operation of construction plant and personnel and noise generated by the works and possibly artificial lighting that may be used in the darker evenings. This is considered to be particularly difficult to manage in regard to option 2 within the busy harbour.

The tidal barrage is a permanent structure within the Inner Bantry Bay and will have a significant impact on the fisheries habitat, and flow characteristic of the bay. The bay is designated a shellfish area. It is however considered from a flora and fauna objective, there is no clear preferred option.

According to the Cork County Development Plan (2014), Bantry AFA is located within an area characterised as Rugged Ridge Peninsula, this landscape character type is considered to be of national importance and value and as having very high sensitivity. The construction of the tidal barrage will have a

significant permanent impact on the setting of the harbour.. Currently there are existing stone walls along the approach to the harbour, these walls are set approximately 0.5m in height. The proposed options will have no direct impact on the Rock House gate lodge (RPS structure 00940) the measures will have no impact on the risk of flooding on this site. The construction of 1m high walls as part of Option 1 will likely change the setting of the views across this harbour from the N71 road and the protected gate lodge it is considered to be the preferred option in terms of landscape objective.

Bantry is characterised as being particularly valuable in terms of architecture. The town is an architectural heritage area and there are a number of NIAHs throughout the town. The provision of a flood wall along the quay will provide protection to a number of RPS's against flooding. Generally, both options perform well in terms of their protection to the AFA and exceed the minimum targets to provide protection to the town, however there are potential for permanent long term negative impacts arising from their setting within the visual envelope of the town resulting from the measures. Option 2 the construction of a tidal barrage is considered to fail the minimum target as it will have change the quality of the landscape characteristic of the harbour area.

5.5 Preferred Flood Risk Management Option

On the basis of the detailed evaluation summarised above, Option 1 is considered the preferred option.

Mitigation actions are recommended for the identified negative effects. The key recommendation is that these negative impacts should be considered during the next stage of option development, when the alignment of the proposed defences and details of the option would be optimised through detailed design in order to limit impacts on the river channel and banks, particularly on water quality status of the river and landscape and architectural setting of the AFA.

6 Kenmare

6.1 Flood Risk

Kenmare is located adjacent the Finnihy River, approximately 1km from the where the river enters the bay. Kenmare is at risk of both fluvial and tidal flooding. The AFA and the existing flood risk are illustrated in Figure 6.1 and Figure 6.2.

Figure 6.1: Kenmare Current Scenario Fluvial Flood Extents

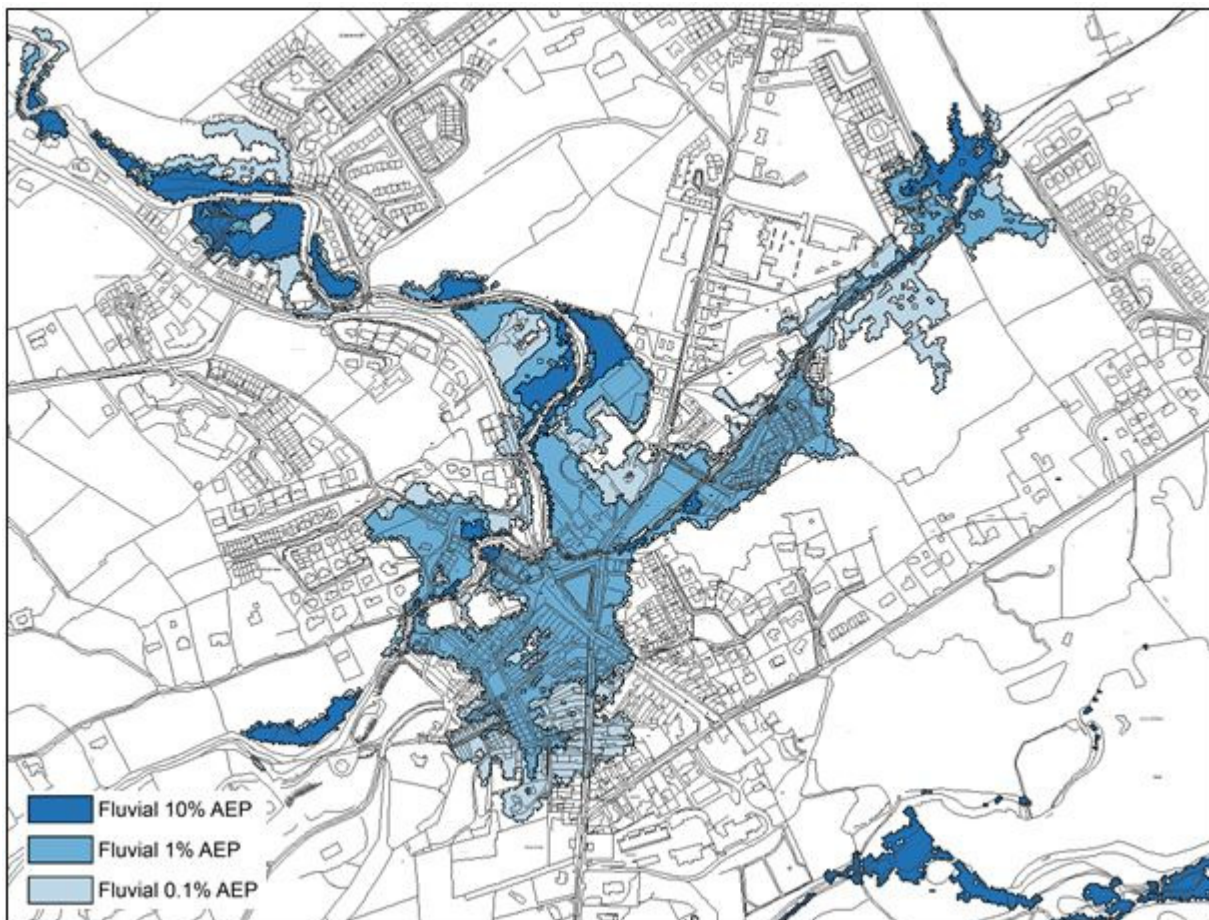
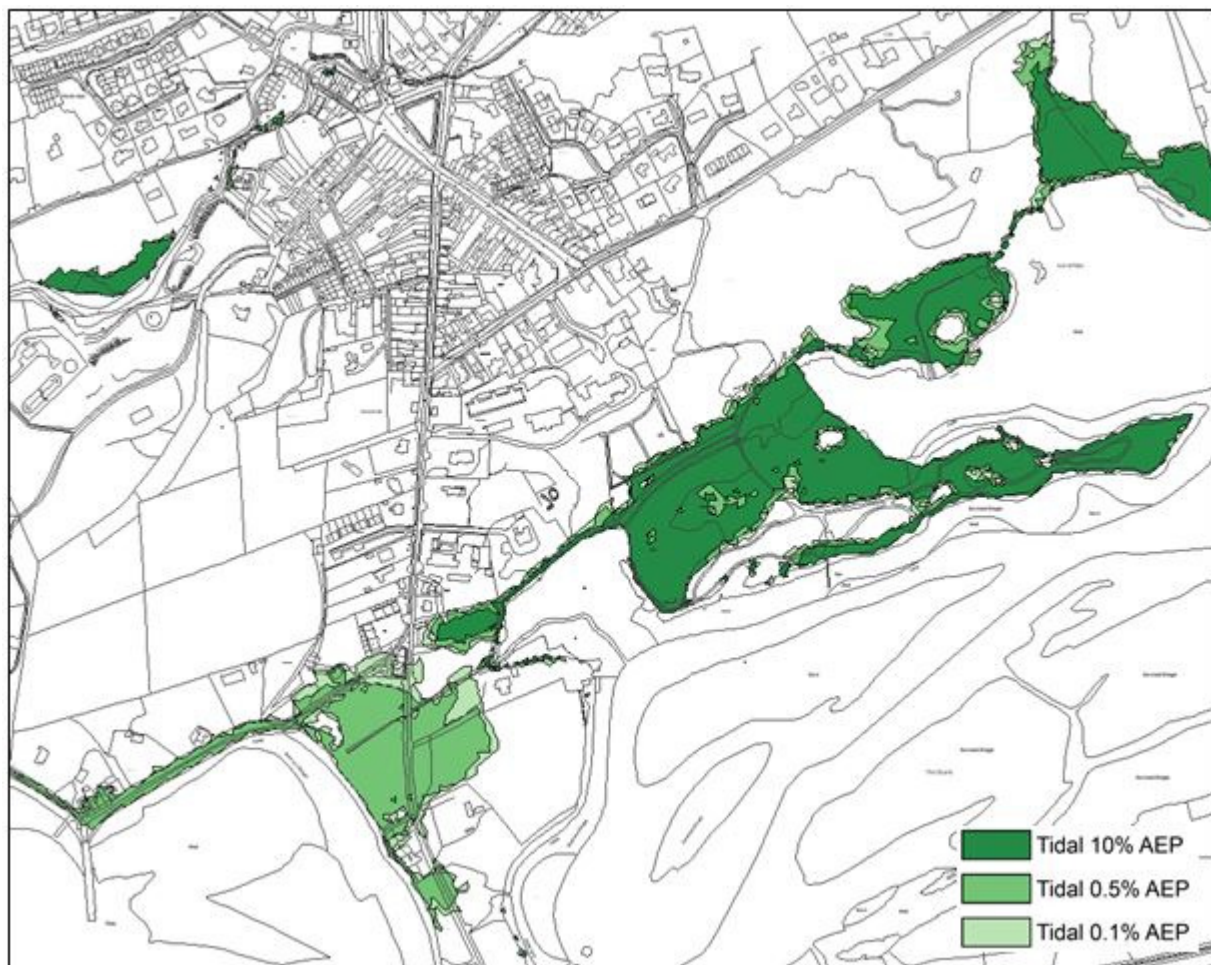


Figure 6.2: Kenmare Current Scenario Tidal Flood Extents



6.2 Viable Flood Risk Management Options

A number of viable flood risk management options were identified and modelled to determine their effectiveness and impact. It should be noted that due to the strategic level of the assessment, the locations in which viable options may be constructed within the AFA may change at detailed design stage if an option is progressed through as a scheme. These are described below and illustrated in **Appendix A** of this report. Multi-criteria analysis (MCA) for each option was undertaken to assess if a preferred option could be established on environmental grounds. The detailed breakdown of SEA scoring for the purpose of this appraisal is provided in **Appendix B** of this report.

Option 1- Flood Defences This option considers the management of flood risk through the construction of flood defences and localised protection works, ranging in height from 0.5m to 4.9m. These defences

include walls and embankments. The locations and heights of the defences are provided in Appendix A of this report. The proposed option fully achieves the required standard of protection for the 1% AEP fluvial event and the 0.5% AEP tidal event.

Option 2 -Storage & Flood Defences- This option considers a combination of storage on Finnihy River and localised fluvial defence works within the town. The locations and heights of the defences are provided in Appendix A of this report. A potential location for the storage of fluvial flows was identified on the Finnihy River approximately 2.5km upstream of the town centre. The proposed option fully achieves the required standard of protection for the 1% AEP fluvial event and the 0.5% AEP tidal event.

Option 3- Conveyance and Flood Defences- This option aims to mitigate the fluvial flood risk by improving the conveyance of the bridge by removing the existing pipe crossing in combination with local protection works within the town. The locations and heights of the defences are provided in Appendix A of this report. The Finnihy Bridge is located in the centre of the town and has been identified as a critical control structure along the watercourse. The capacity of the bridge is restricted by a pipe crossing through the eyes of the bridge. The pipe is encased in concrete forming a beam 0.7m by 0.5m and contains an operational sewer. The proposed option fully achieves the required standard of protection for the 1% AEP fluvial event and the 0.5% AEP tidal event.

Option 4- Flow Diversion- This option aims to mitigate fluvial flooding risk along the Kealnagower Stream and through the town by diverting flows to Kenmare Bay.

Option 5 Conveyance, Flow Diversion and Flood Defences- This option includes a combination of measures. the removal of the existing pipe under Finnihy Bridge along with the diversion of the Kealnagower stream to Kenmare Bay and fluvial and tidal flood defences. Fluvial flood defences comprise walls and embankments on the Finnihy and Kealnagower rivers and tidal flood defences consisting of walls, embankments and removable barriers. The locations and heights of the defences are provided in **Appendix A** of this report.

6.3 Key Environmental Sensitivities

- Kenmare is at risk of both fluvial and tidal flooding.
- The River Finnihy flows from Barfinnihy Lough down a very steep channel before being joined by a number of small tributaries, and flowing south-eastwards towards Kenmare. Within the town, the River Finnihy flows over a waterfall 300m upstream of Finnihy Banks estate, and is joined by the Lissaniska tributary immediately upstream of Finnihy Bridge. The river channel then meanders to the west, under Cromwell's Bridge and continues to outfall into Kenmare Bay/River.
- The River Finnihy is tidally influenced as far as Cromwell's Bridge under typical tidal conditions but the tidal influence can extend beyond Finnihy Bridge under extreme high tides. The only other tributary relevant to be considered in Kenmare is Gortamullen Stream which drains the bog land to the north of

the N70. The Gortamullen Stream rises and then splits flow between the Claddanure catchment to the west and the Finnihy catchment to the east.

- Water quality Kenmare Bay/River and Finnihy Catchments is generally classified as good under the WFD. There are no significant polluting sources within the AFA at risk of fluvial or tidal flooding.
- The Kenmare AFA overlaps or is in close proximity to the following Natura 2000 sites: Kenmare River Special Area of Conservation (SAC), and Mucksna Wood SAC.
- Kenmare Bay known as Kenmare “River” SAC is protected for its shallow inlets and varying shoreline cliffs and dune areas. It narrows towards Kenmare town into “The Sound”, inland of the N71 crossing.
- Kenmare River is designated for Lesser Horseshoe Bat. There are fourteen confirmed roosts for this species within a 6km radius⁷ of Kenmare (NPWS Data);
- Kenmare River is identified as a Marine Protection Area (MPA) under the OSPAR Convention to Protect the Marine Environment of the North East Atlantic. No legislation currently exists in Ireland to legally underpin protected areas established under the OSPAR Convention. Therefore Ireland has established a number of its OSPAR MPAs as SACs and as such Kenmare River is one such site.
- Kenmare River is designated shellfish areas under the Communities (Quality of Shellfish Waters) Regulations 2006 (as amended). The Finnihy Catchment is also considered a Freshwater Pearl Mussel (FPM) sensitive area.
- Kenmare is a planned town following a triangular-based layout and majority of the town has been designated an Architectural Conservation Area (Cork County Development Plan (2014).
- According to the Cork County Development Plan (2014), Kenmare AFA is located within Kenmare Valley landscape character area. The area is considered to have high tourism value and low to medium sensitivity to development.
- Receptors at risk 1% AEP fluvial flooding extent within the AFA:
 - 143 No. Residential Properties;
 - 1 No. Social Amenity Site
 - 8 No. NIAH
 - 3 No. RMP
 - 5 No. Roads at risk
- Receptors at risk 0.5% AEP tidal flooding extent;
 - 12 No. Residential Properties;
 - 1 No. Architectural site
 - 1 No. Roads at risk

⁷ Bat Conservation Ireland recommends a 6km zone of assessment such that impacts on foraging and commuting are accounted for

6.4 Environmental Assessment

Table 6.1 below provides a summary of the potential impacts arising from the proposed options as determined through the SEA assessment. In addition Table 6.1 below also highlights the requirement for mitigation measures for each option under each social and environmental objective. Table 5.1 should be read in conjunction with the SEA scoring matrix contained within **Appendix B**.

Table 6.1: Kenmare Options Scoring Matrix – Social and Environmental Objectives

SEA Objectives	Do nothing		Option 1		Option 2		Option 3		Option 4		Option 5	
	Impact	Mitigation required	Impact	Mitigation required	Impact	Mitigation required	Impact	Mitigation required	Impact	Mitigation required	Impact	Mitigation required
Human Health and life of residents	O	N	√√	N	√√	N	√√	N	√√	N	√√	N
High vulnerability properties	O	N	O	N	O	N	O	N	O	N	O	N
Social infrastructure and amenity	O	N	√	N	√	N	√	N	√	N	√	N
Risk to local employment	O	N	O	N	O	N	O	N	O	N	O	N
Environmental Objectives												
WFD Directive	O	N	X	Y	X	Y	X	Y	X	Y	X	Y
Birds and Habitats Directive	O	N	X	Y	X	Y	X	Y	XX	Y	XX	Y
Flora and Fauna	O	N	XXX	Y	XXX	Y	XXX	Y	XXX	Y	XXX	Y
Fisheries	O	Y	X	Y	X	Y	X	Y	X	Y	X	Y
Landscape	O	N	√√	Y	√√	Y	√√	Y	XX	Y	XX	Y
Architectural Heritage	XX	Y	√	Y	√√	Y	√√	Y	√√	Y	√√	Y
Archaeological Heritage	O	N	√	Y	√√	Y	√√	Y	√√	Y	√√	Y

SEA scoring Matrix

Score	Key	Description
+5	√√√	Achieving aspirational target
+4	√√	
+3	√√	Partly achieving aspirational target
+2	√	Exceeding minimum target
+1	√	
0	O	Meeting minimum target
-1	X	Just failing minimum target
-2	X	
-3	X X	Partly failing minimum target
-4	X X	
-5	XX X	Fully failing minimum target
-999.99	XX X	Unacceptable negative impact where feasible alternative exists

All options generally performed the same when assessed against the WFD objective. The construction of all measures will result in temporary negative impacts on the water body status in the absence of appropriate mitigation. There are no significant polluting sources at risk of flooding within 1% AEP fluvial flood extent.

The Kenmare River SAC is not designated for lamprey / salmon. The Finnihy River and Kenmare River are not designated as salmonid rivers under the European Communities (Quality of Salmonid Waters) Regulations 1988, however the rivers are likely to have potential as juvenile habitats for fish species. The construction stage of all options could result in temporary negative impacts on the water body status, resulting from sedimentation, accidental pollution or loss of habitat in the absence of appropriate mitigation. Extensive lengths of permanent walls are required and these will replace the natural banks as there is limited space available within the town. The construction of the walls and embankment will result in a temporary loss of fisheries habitat. Option 2 will require in-stream works during the construction of the control structure in addition to the temporary impacts caused by disturbance to river bed and banks, this option will also result in permanent loss of river bed and bank within the footprint of the control structure. However, there is no discernable long term difference between the options in their potential impacts on the integrity of fisheries habitat.

There are no protected views or prospects within the town or the along the approach N71 road. The measures included as part of Option 1 includes the construction of considerable lengths of embankment/walls ranging in height (1-3m), there is potential impacts resulting from the permanent

change in the existing landscape. There are a number of amenity walkways along the Kenmare River banks, however the proposed measures are not directly impacting on these walkways. All options include measures for the construction of a tidal defence wall and increase of road surface height along pier road. Whilst there are no designated views across the bay the construction of approximately 1.3m high permanent structure will change the view and prospect and character in the area.

Short term negative impacts are likely during the the construction of all measures including the possible removal of riparian habitat and riverside screen planting in order to facilitate the construction of the measures. Option 2 includes the construction of an online storage area, clearance of a significant extent of existing woodland/scrubland will be required to facilitate the construction prior to establishment of mitigation. The proposed storage area is outside the SAC boundary. The lower reaches of the Finnihy River is within the Kenmare River SAC. The SAC is principally designated for coastal habitats and species, the proposed measures will not directly impact any habitat of conservation importance. Coastal defences and road raising measures are the same for each option, these measures are not expected to have any direct impact on the Annex 1 habitats of Kenmare River SAC.

There are fourteen confirmed Lesser Horseshoe Bat roosts for this species within a 6km radius of Kenmare (NPWS Data). The nearest roost is located approximately 1.5km from Finnihy Bridge. Disturbance to the roost by noise is extremely unlikely given the distance between the roost and flood risk management options. Lesser Horseshoe Bats normally forage in woodlands/scrub within 2.5km of their roosts (Schofield, 2008). It is highly unlikely that bat commuting or foraging would be affected by the implementation of defences and conveyance measures within the town given the location of these measures within an urban setting (Lesser Horseshoe Bats are highly unlikely to be foraging within this environment as they will avoid brightly lit areas.

Option 2, storage area is located on the Finnihy River parallel to the N71 road immediately north of woodland habitat and immediately across the road from ribbon development housing. This location is approximately 2.48km from the nearest roosting site. Given the distance from the nearest roost site and given the presence of light sources at this location, it is unlikely that Lesser Horseshoe Bat forage at this location. Therefore it is considered that any potential impacts on Lesser Horseshoe Bat foraging are unlikely.

Otter habitat as mapped in the Kenmare River Conservation Objectives Report represents a 10m terrestrial buffer along shoreline. This is not confirmed through field survey. The storage area on the Finnihy River is outside of this buffer. It is unlikely that Otter use the habitat in proximity to the storage areas given that Otter would have to pass through the village in order to commute to the marine feeding areas. The removal of riparian habitat within the footprint of the structures of the storage areas is extremely unlikely to impact Otter habitats.

A FPM survey of the Finnihy River did not extend to the location of the proposed storage area. FPM were recorded approximately 600m downstream. Option 2 will require channel work, whilst the survey did not extend upstream to this location, it is considered quite possible that FPM are likely to occur upsteam of the recorded area and possibly upstream to the storage area. The proposed construction of the storage area has potential for direct destruction of FPM. No mitigation is available for this measure, in this regard this

option is considered to have unacceptable negative impacts on the FPM. Construction of walls and embankments bankside could also result in discharges of elevated levels of suspended solids to the Finnihy River with detrimental impacts on FPM populations downstream. The potential impact may be mitigated against by strict site management such as but not limited to provision of appropriate set back and buffer distances, and spoil management. Option 2, 3, 4 and 5 will require instream works to be carried out however, it is considered that Option 2 will require considerable in stream works and removal of bankside planting during construction. Option 2 has potential to result in significant loss of sediment and pollutants to the river which may ultimately enter the Finnihy River with potential to impact FPM, Option 2 is the least preferred option in regard to the protection of the FPM

It is noted that the invasive species Japanese Knotweed and Himalayan Balsalm occur along the Finnihy River. For each of the options there is potential that works may spread these species. Detailed invasive species management is required to manage the control and spreading of the species during the construction stage.

Kingfisher was previously recorded on the River Finnihy in the past, the exact recorded location are unknown at this stage. It is uncertain at this stage whether there is potential for disturbance or destruction of nests during the construction stage for each of the options.

According to the Kerry County Development Plan, Kenmare is designated at county level as an Architectural Conservation Zone. There are number of site of architectural and archaeological significance at risk within the AFA. Each of the options will provide protection to these sites. Therefore no preference between options is considered to existing in the context of the architectural and archaeological objective.

There is no preference in terms of the social objectives, each of the do something options ensures the risk to flooding on human health and risk to community is minimised.

6.5 Preferred Flood Risk Management Option

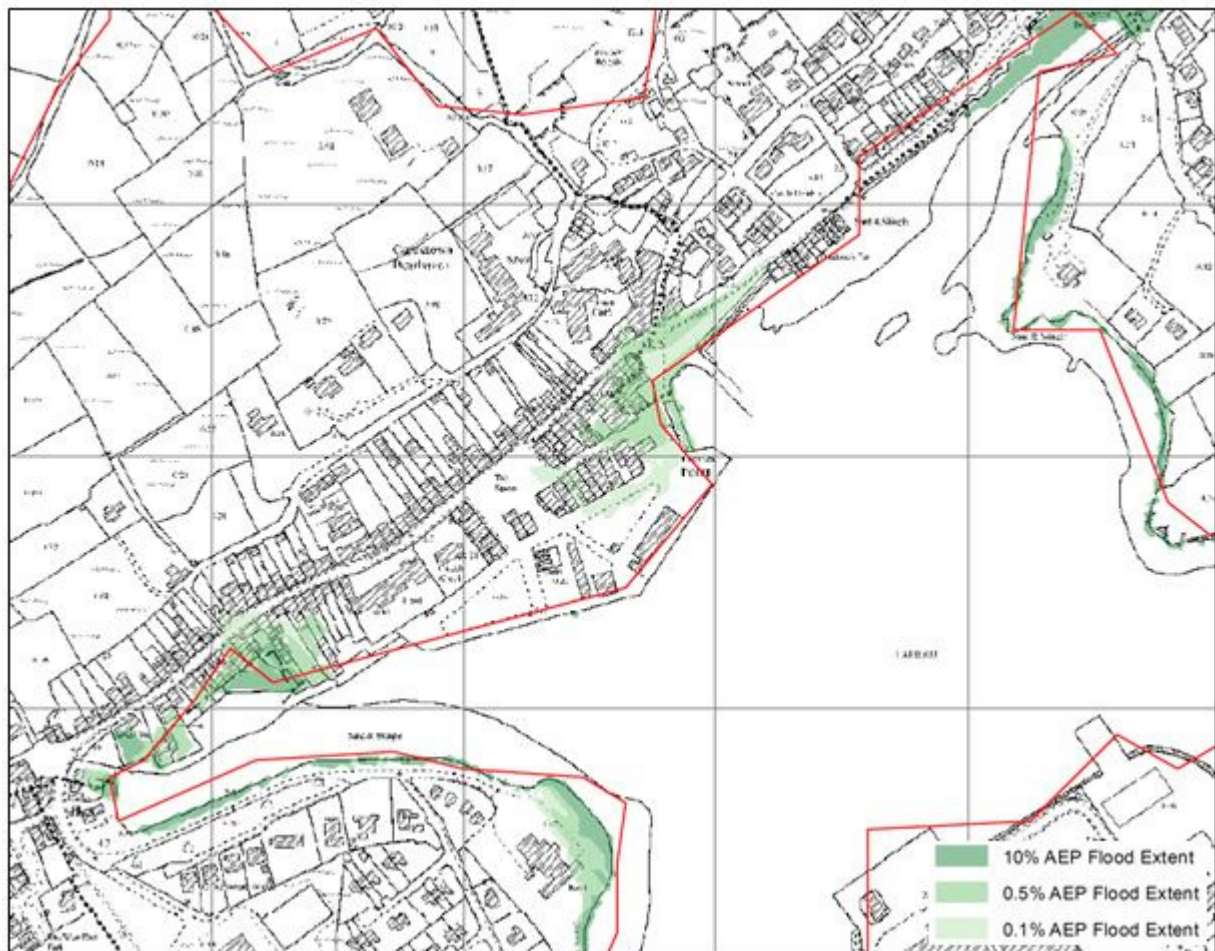
On the basis of the detailed evaluation Option 3 has been determined to be the preferred option. Mitigation actions are recommended for the identified negative effects. The key recommendation is that these negative impacts should be considered during the next stage of option development, when the alignment of the proposed defences and details of the option would be optimised through detailed design in order to limit impacts on the river channel and banks within the SAC. The appearance of floodwalls would be designed appropriate to minimise potential visual effects within the AFA.

7 Castletownbere

7.1 Flood Risk

Castletownbere is located in County Cork on the Beara Peninsula and is at risk of tidal flooding. The AFA and the existing flood risk are illustrated in Figure 7.1.

Figure 7.1: Castletownbere – Current Scenario Tidal Flood Extents



7.2 Viable Flood Risk Management Options

One viable flood risk management option was identified and modelled to determine its effectiveness and impact. This is described below and illustrated in **Appendix A** of this report. It should be noted that due to the strategic level of the assessment, the locations in which viable options may be constructed within the AFA may change at detailed design stage if an option is progressed through as a scheme. Multi-criteria

analysis (MCA) for the option was undertaken to assess if a preferred option could be established on environmental and social grounds. SEA scoring for the purpose of this appraisal is provided in **Appendix B** of this report.

Option 1 –Flood Defences- This option aims to mitigate the tidal flood risk through the construction of flood defences and localised protection works. These defences include walls and some flood barriers. The locations and heights of the defences are provided in **Appendix A** of this report. The proposed option fully achieves the required standard of protection for the 0.5% AEP tidal event.

7.3 Key Environmental Sensitivities

- Castletownbere is located on the Beara Peninsula and is at risk of tidal flooding. The Beara Peninsula is classified as having a good water status under the WFD.
- The eastern extent of the Beara Peninsula is designated shellfish waters under the European Communities (Quality of Shellfish Waters) Regulations 2006 as amended.
- There are no significant polluting sources within the 0.5% tidal extent within the AFA.
- The Castletownbere AFA boundary does not overlap with any Natura 2000 site boundary. There are no habitats of conservation importance noted within the AFA. The nearest Natura 2000 site is the Beara Peninsula SPA (004155), which is approximately 3.5km south of Castletownbere.
- According to the Cork County Development Plan (2014), Castletownbere AFA is located within "High Value Landscape". The approach road R571 and R572 are designated scenic routes within the Cork County Development Plan.
- According to the Cork County Development Plan (2014), Castletownbere AFA is located within an area characterised as "Rugged Ridge Peninsulas" landscape character type. The landscape type is deemed to be of very high value and very high sensitivity and of national value.
- Receptors at risk from tidal flooding 0.5% AEP within the AFA:
 - 10 No. Residential properties
 - 19 No. Non-Residential properties
 - 3 No. Social Amenity Sites
 - 3 No. NIAH sites
 - 4 No. Roads

7.4 Environmental Assessment

Table 7.1 below provides a summary of the potential impacts arising from the proposed options as determined through the SEA assessment. In addition Table 7.1 below also highlights the requirement for mitigation measures for each option under each social and environmental objective. Table 7.1 should be read in conjunction with the SEA scoring matrix contained within **Appendix B**.

Table 7.1: Castletownbere Options Scoring Matrix – Social and Environmental Objectives

SEA Objectives	Do nothing		Option 1	
Social Objectives	Impact	Mitigation required	Impact	Mitigation required
Human Health and life of residents	O	Y	√ √	Y
High vulnerability properties	O	N	O	N
Social infrastructure and amenity	O	Y	√ √	Y
Risk to local employment	O	N	√ √	Y
Environmental Objectives				
WFD Directive	O	Y	X	Y
Birds and Habitats Directive	O	N	O	N
Flora and Fauna	O	N	O	Y
Fisheries	O	N	O	Y
Landscape	O	N	X	Y
Architectural Heritage	X X	Y	√ √	Y
Archaeological Heritage	O	Y	√	Y

SEA scoring Matrix

Score	Key	Description
+5	√√√	Achieving aspirational target
+4	√√	
+3	√√	Partly achieving aspirational target
+2	√	Exceeding minimum target
+1	√	
0	O	Meeting minimum target
-1	X	Just failing minimum target
-2	X	
-3	X X	Partly failing minimum target
-4	X X	
-5	XX X	Fully failing minimum target
-999.99	XX X	Unacceptable negative impact where feasible alternative exists

Having regard to the WFD objective, the construction of the do something option 1 will result in temporary negative impacts on the water body status in the absence of appropriate mitigation. There are no significant polluting sources at risk of flooding within 1% AEP tidal flood extent.

Having regard to the Birds and Habitats objective, impacts on the conservation interests of the Beara Peninsula SPA are extremely unlikely given that the flood walls and embankments would be constructed

within the urban setting of the town which is sub-optimal habitat for Fulmar (*Fulmarus glacialis*) and Chough (*Pyrrhocorax pyrrhocorax*) and disturbance to species is extremely unlikely given distance from the AFA to the Beara Peninsula SPA. The potential for significant impact on local flora and fauna are not anticipated, as the proposed option includes the construction of walls and barriers within existing hardstanding areas in Castletownbere.

The eastern extent of the Beara Peninsula is designated shellfish waters under the European Communities (Quality of Shellfish Waters) Regulations 2006 as amended. The proposed works will be confined to within the existing urban landscape at the western extent of the town. There is no potential for the destruction of fisheries habitats within the bay.

Castletownbere is located within an area classified as High Value Landscape" (Cork County Development Plan 2014). The approach roads into the town along the R571 and R572 are designated scenic routes within the County Development Plan. The proposed measures consist of low flood walls, with the highest wall located at the rear of existing properties, therefore the measures will not be visible from the road. The proposed flood walls located in the harbour area are low lying. These walls are expected to be within the existing character of the harbour setting. It is considered that there is potential for some short term impact on the visual amenity of the area during the construction however the appearance of floodwalls would be designed appropriate to minimise potential visual effects within the AFA.

There are number of site of architectural significance at risk within the AFA. Do something Option 1 will provide protection to these sites.

7.5 Preferred Flood Risk Management Option

On the basis of the detailed evaluation Option 1 has been determined to be the preferred option. Mitigation actions are recommended for the identified negative effects. The key recommendation is that these negative impacts should be considered during the next stage of option development, when the alignment of the proposed defences and details of the option would be optimised through detailed design in order to limit impacts on the harbour. The appearance of floodwalls would be designed appropriate to minimise potential visual effects within the AFA.

8 Conclusions and Next Steps

8.1 Conclusions

The strategic environmental assessment has identified that the preferred alternatives are as set out below.

Table 8.1: Preferred Flood Risk Management Options (UoM 21)

AFA	Preferred Flood Risk Management Option
Bantry	Option 1 (Fluvial and Tidal Flood Defences)
Kenmare	Option 3 (Conveyance and Flood Defence works)
Castletownbere	Option 1 (Flood Defences)

8.2 Next Steps

The findings from the strategic environmental assessment of the flood risk management options will be integrated into the overall multi-criteria analysis for the identification of the overall preferred flood risk management option in each AFA.

Once the preferred flood risk management option has been identified in each AFA the draft flood risk management plan will be prepared. The next stage (Stage 3 with reference Figure 3.1 in Chapter 3 of this report) of the strategic environmental assessment process involves the identification of the environmental impacts (including where appropriate mitigation measures) and recommending monitoring for the evaluation of the plan.

Appendices

Appendix A. AFA Option Drawings	10
Appendix B. SEA Scoring Matrix	18

Appendix A. AFA Option Drawings

Figure A.1: Bantry Option 1 Fluvial and Tidal Flood Defences

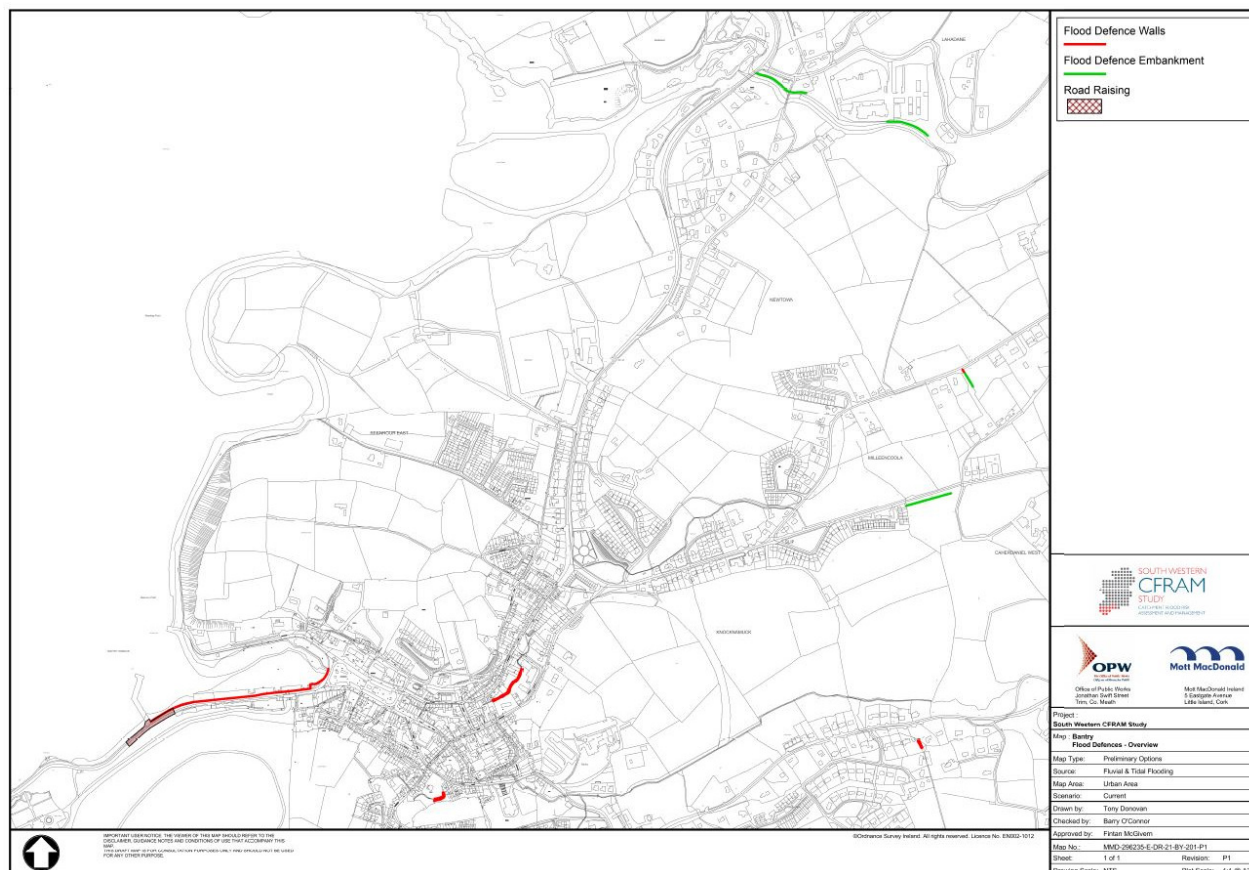


Figure A.2: Bantry Option 2 Fluvial Flood Defences and Tidal Barrage

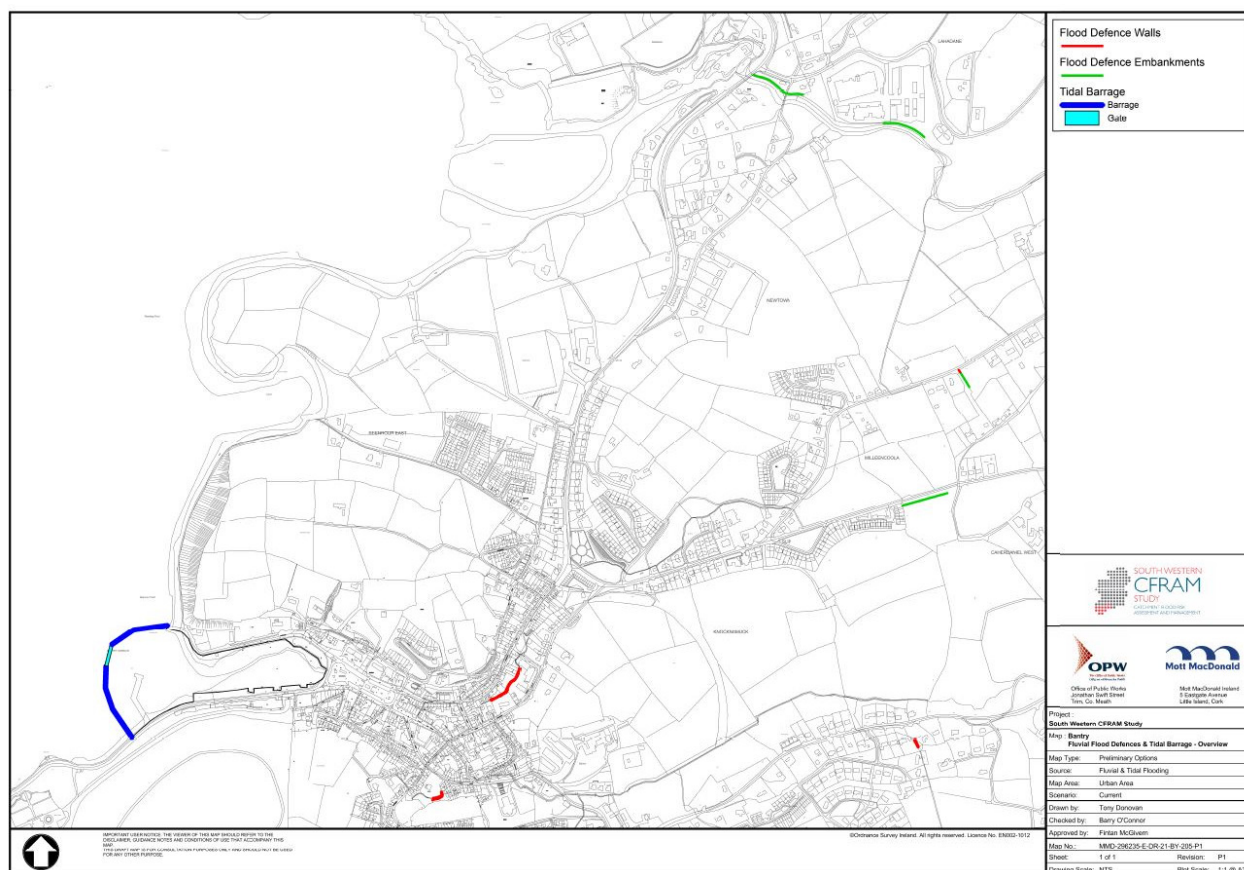


Figure A.3: Kenmare Option 1 Flood Defences

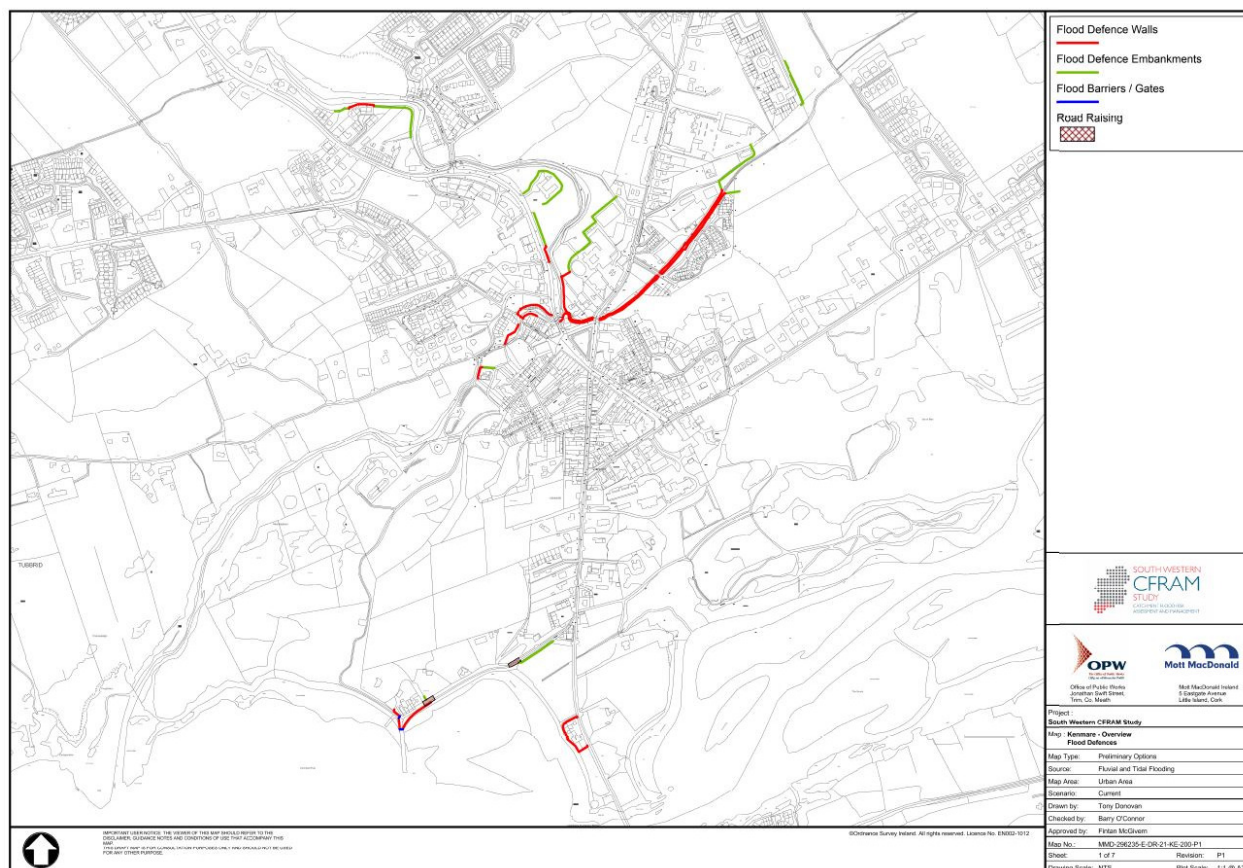


Figure A.4: Kenmare Option 2 Storage & Flood Defences



Figure A.5: Kenmare Option 3 Conveyance and Flood Defences

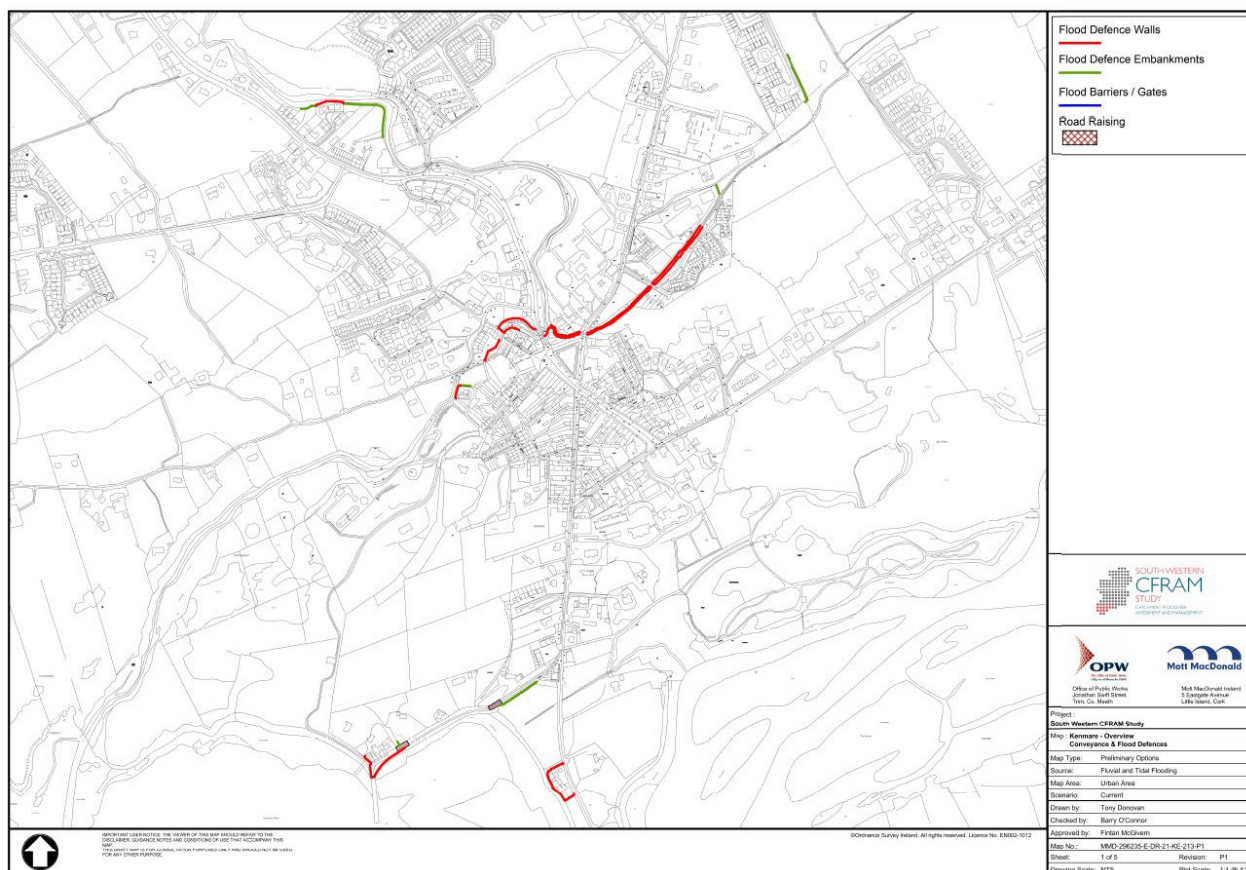


Figure A.6: Kenmare Option 4 Flow Diversion & Flood Defences

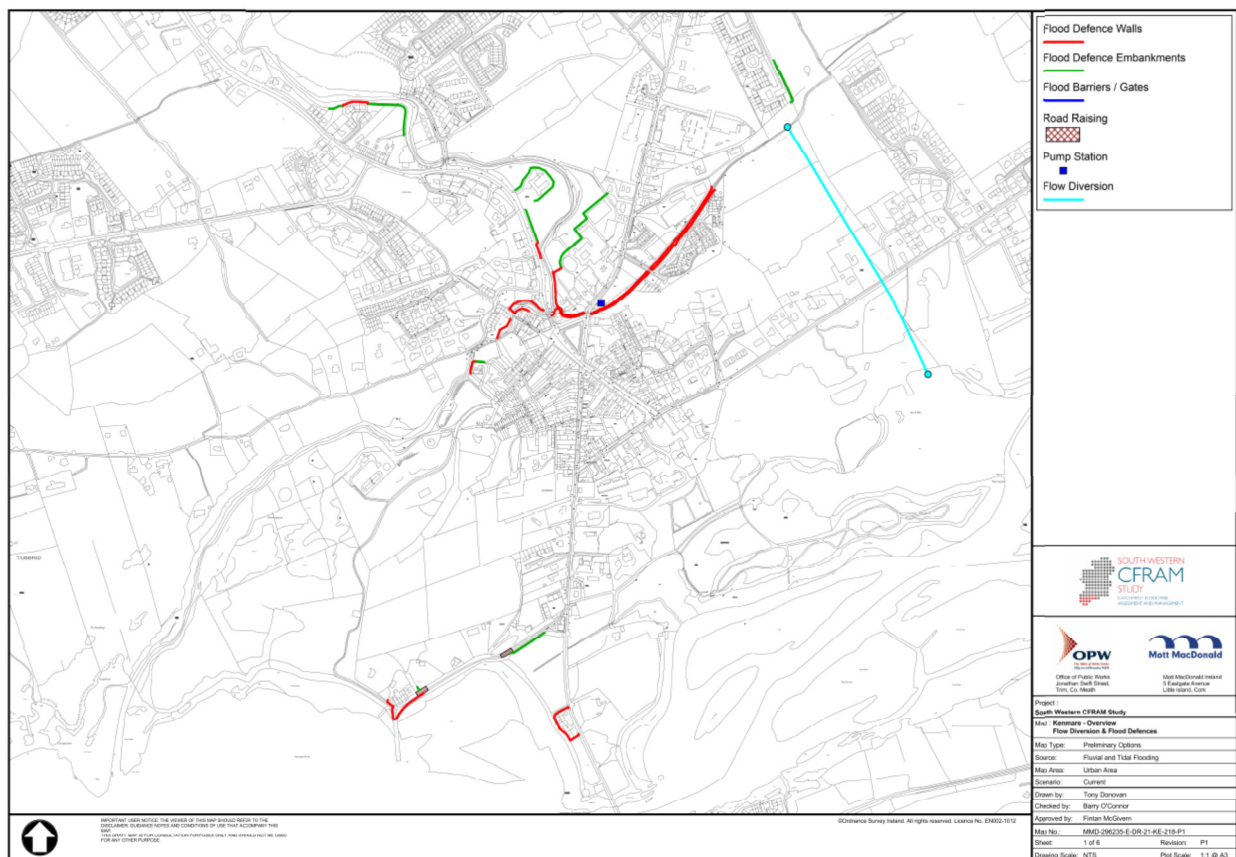
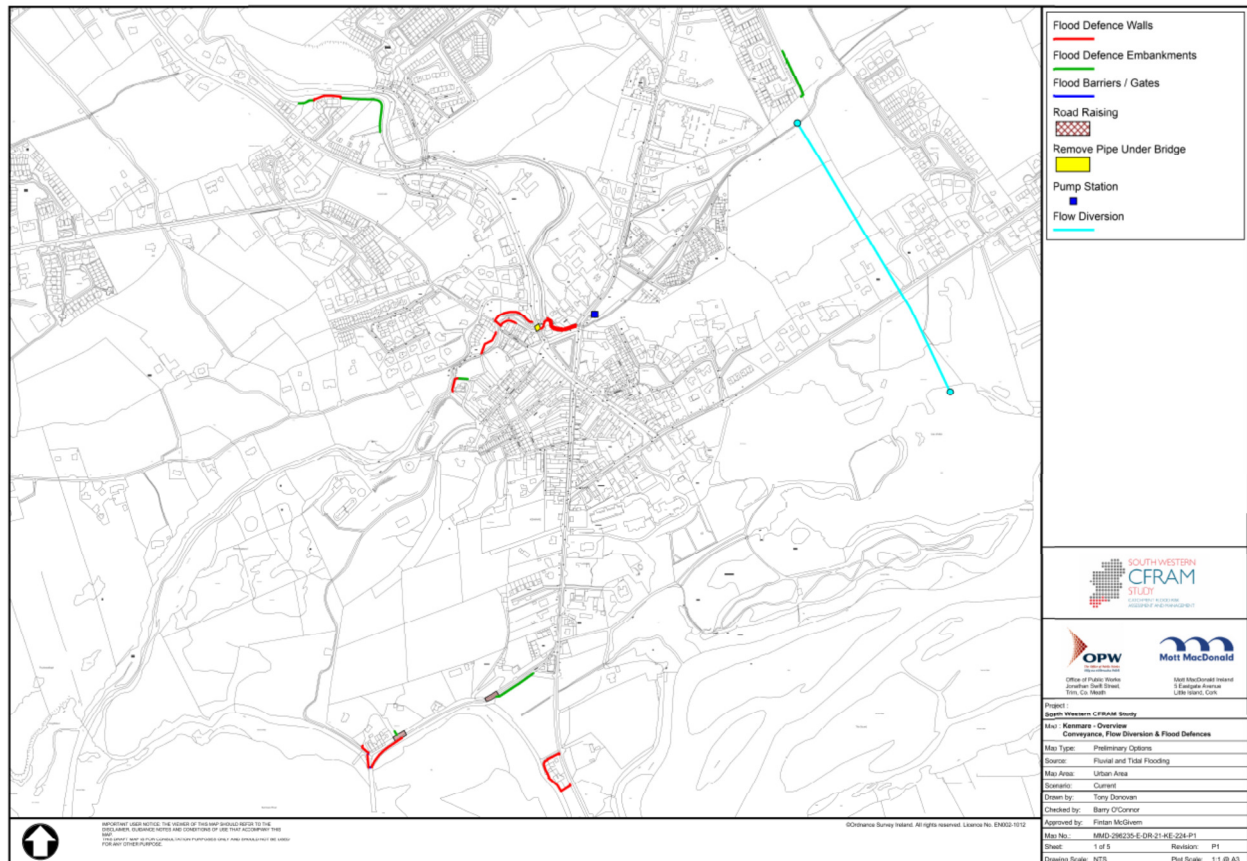


Figure A.7: Kenmare Option 5 Conveyance, Flow Diversion and Flood Defences



[illegible]

Appendix B. SEA Scoring Matrix

Score	Key	Description
+5	√√√	Achieving aspirational target
+4	√√	
+3	√√	
+2	√	Exceeding minimum target
+1	√	
0	O	
-1	X	Just failing minimum target
-2	X	
-3	X X	
-4	X X	Partly failing minimum target
-5	XX X	
-999.99	XX X	
		Unacceptable negative impact where feasible alternative exists

Appendix D. Draft Screening for Appropriate Assessment under the Habitats Directive



South Western CFRAM Study

Screening for Appropriate Assessment UoM21

December 2015

Office of Public Works

South Western CFRAM Study

Screening for Appropriate Assessment UoM21

December 2015

Office of Public Works

Jonathan Swift Street
Trim
Co. Meath

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	18 December 2014	R. Mansfield	B. O' Conor	F. McGivern	Initial Draft for submission to CFRAM AA Workshop (January 2015)
B	21 December 2015	R. Mansfield	B. O' Conor	F. McGivern	

Information class: Standard

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

Contents

Chapter	Title	Page
	Executive Summary	i
1	Introduction	4
1.1	Flood Risk Assessment and Management in Ireland	4
2	Appropriate Assessment	6
2.1	Statutory Requirement for Appropriate Assessment	6
2.2	Appropriate Assessment – The Process	7
2.3	Objective of Appropriate Assessment Screening	8
2.4	Methodology	9
2.5	Statement of Authority	10
2.6	Consultation	10
3	Description of the Plan	11
3.1	Flood Risk Management Plan	11
3.2	Overview of the South Western River Basin District	12
3.2.1	Units of Management in the SWRBD	12
3.3	Flood Risk Management Options	13
3.4	The Dunmanus-Bantry-Kenmare Bay Catchment (UoM21)	15
3.4.1	Areas for Further Assessment in UoM 21	17
3.5	Flood Risk Management Options for the Dunmanus / Bantry / Kenmare Bay UoM	18
3.5.1	Non-Structural Measures	18
3.5.2	Structural Measures	20
3.6	Flood Risk Management Options with Potential for Significant Effects on Natura 2000 Sites	21
3.6.1	Potential Impacts of Non-Structural Options in UoM 21	21
3.6.2	Potential Impacts of Structural Options in UoM 21	22
4	Characteristics of Natura 2000 Sites	25
4.1	Natura 2000 Sites within the Zone of Impact	25
4.2	Likelihood of Impacts on Natura 2000 Sites	25
4.2.1	Bantry AFA	26
4.2.2	Castletownbere AFA	26
4.2.3	Kenmare AFA	27
5	Significance of Impacts on Natura 2000 Sites	29
5.1	General	29
5.2	Assessment of Significance	29
6	Conclusions and Screening Statement	30

7 References 33

Figures

Figure 2-1 Appropriate Assessment the Process	8
Figure 3-1 South Western River Basin District (SWRBD)	12
Figure 3-2 Units of Management and Areas for Further Assessment in the SWRBD	13
Figure 3-3 Dunmanus / Bantry / Kenmare Bay UoM 21	17

Tables

Table 3.1: Suite of Flood Risk Management Options	14
Table 3.2: List of AFAs in the Dunmanus / Bantry / Kenmare Bay UoM	17
Table 3.3: Flood Forecasting Infrastructure required	19
Table 3.4: Structural Flood Risk Management Options for UoM 21	20
Table 4.1: Noise Levels, dB(A), at Various Distances from Construction Activities	27
Table 6.1: Screening Matrix for UoM 21	30

Executive Summary

Introduction

The Office of Public Works (OPW) is the competent authority in Ireland for the implementation of the EU Floods Directive [2007/60/EC], which is transposed into Irish law by the European Communities (Assessment and Management of Flood Risk) Regulations, 2010. The Floods Directive requires Member States to:

- Identify areas of existing or foreseeable future potentially significant flood risk (referred to as Areas for Further Assessment - AFAs);
- Prepare flood hazard and risk maps for the AFAs;
- Prepare Flood Risk Management Plans by 22 December 2015, setting objectives for managing the flood risk within the AFAs and setting out a prioritised set of measures for achieving those objectives.

Mott MacDonald Ireland Ltd. was appointed by the OPW to undertake the above activities as part of the Catchment Flood Risk Assessment and Management Study (CFRAMs) for the South Western River Basin District.

The South Western River Basin District CFRAM study (and output Flood Risk Management Plans) will be informed by Appropriate Assessment, the requirement for which is derived from Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive). Appropriate Assessment is the process of determining whether the Flood Risk Management Plan is likely to pose a risk to the attainment or maintenance of conservation objectives for areas protected for their ecological value within the State (Natura 2000 sites - Special Areas of Conservation and Special Protection Areas), and the identification of alternatives or mitigation as appropriate.

One Flood Risk Management Plan will not be developed for the entire South Western River Basin District but rather, targeted individual plans will be produced on a waterbody catchment basis (Units of Management basis). The South Western River Basin District is broken down into five Units of Management:

- The Munster Blackwater Catchment (UoM18)
- The Lee / Cork Harbour Catchment (UoM19)
- The Bandon / Skibbereen Catchment (UoM20)
- The Dunmanus / Bantry / Kenmare Bay Catchment (UoM21)
- The Laune / Maine / Dingle Bay Catchment (UoM22)

UoMs are further broken down in to Areas for Further Assessment (AFAs). These are communities within an individual UoM with a quantifiable flood risk and include towns, villages and areas where significant development is anticipated. Associated with AFAs are high and medium priority watercourses. High priority watercourses are located within and 2km upstream of AFAs whereas medium priority watercourses are the interconnecting watercourses between AFAs or the coast.

Dunmanus- Bantry- Kenmare Bay Catchment (UoM21)

The Dunmanus / Bantry / Kenmare Bay UoM contains four Areas for Further Assessment (AFAs): Bantry, Castletown Bearhaven (Castletownbere), Durrus and Kenmare. Associated with the AFAs is over 25km of high and medium priority watercourse.

Flood risk management options for the Dunmanus / Bantry / Kenmare Bay UoM have been identified through option appraisal as follows:

AFA	Viable Options
Bantry	<ul style="list-style-type: none"> Flood defences and road raising - flood embankments in Caherdaniel West and Newtown and tidal walls in Bantry town couples with road raising on the N71. Flood defences and tidal barrage – flood embankments in Caherdaniel West and Newtown and tidal barrage in the harbour with an inner area of approximately 78,880m². The barrage will need to be closed at the low tide preceding a tidal event in order to accommodate fluvial flows. The barrage would remain closed until the tide level outside is lower than the maximum water level within the barrage (modelled as being approx. 9 hours).
Castletownbere	<ul style="list-style-type: none"> Walls and Flood Barriers
Durrus	<ul style="list-style-type: none"> No measures are proposed.
Kenmare	<ul style="list-style-type: none"> Flood defences including walls, embankments, road raising and flood gates Storage on the Finnihy River coupled with flood defences Removal of a foul sewage pipe from across the eye of Finnihy Bridge coupled with flood defences

Natura 2000 Sites

Flood risk management options in Kenmare are proposed for both the Finnihy River. Kenmare River SAC (002158) extends from the N71 road bridge crossing seaward as far as Dursey Island and Scariff Island and includes the tidal extent of the Finnihy River which stops approximately 200m short of the Finnihy Bridge. Flood risk management measures are proposed at the Finnihy Bridge and may extend to within the SAC.

The Castletownbere AFA boundary does not overlap with any Natura 2000 site boundary. The nearest Natura 2000 site is the Beara Peninsula SPA (004155), which is approximately 3.5km south of Castletownbere.

The Bantry AFA boundary does not overlap with any Natura 2000 site boundary.

There is potential for impacts on the qualifying features of the Kenmare River SAC (002158) and the Beara Peninsula SPA (004155).

Potential Impacts on Qualifying Features

Bantry AFA

There is no potential impacts for the flood risk management works in the Bantry AFA.

Castletownbere AFA

Disturbance to wetland birds is extremely unlikely given distance from site.

Kenmare AFA

Impacts on Annex I habitats are determined to be extremely unlikely given that these are primarily coastal habitats and the options will be implemented inland.

Impacts on Whorl Snail, Lesser Horseshoe Bat, Otter and Common Seal are determined to be extremely unlikely given the distance of these species from the indicative locations for the viable flood risk management options.

The Finnihy River hosts a Freshwater Pearl Mussel population. This is not a qualifying feature of the Kenmare River SAC therefore there can be no impacts on the conservation objectives of the SAC.

Significance of Impacts

No likely impacts have been determined on the Kenmare River SAC and the Beara Peninsula SPA from the implementation of viable options in the Kenmare AFA and the Castletownbere AFA.

No likely significant effects on Natura 2000 sites are reasonably foreseeable as a result of the implementation of flood risk management measures in UoM 21.

1 Introduction

1.1 Flood Risk Assessment and Management in Ireland

Flood risk management in Ireland has historically focused on land drainage schemes for the improvement of agricultural land. The 1945 Arterial Drainage Act established a national drainage authority (the Office of Public Works) with the remit of implementing a national arterial drainage programme. The Arterial Drainage Act was amended in 1995 to include for the protection of urban areas suffering from flooding.

In 2004, the Irish Government adopted a new National Flood Policy for Ireland which shifted the emphasis in addressing flood risk away from arterial drainage (targeted towards the protection of agriculture and cities / town liable to serious flooding) and towards a waterbody catchment-based flood risk assessment (a similar catchment-based management approach to that already being implemented under the Water Framework Directive 2000/60/EC).

In 2007 the Floods Directive [2007/60/EC] was published which requires the establishment of a framework of measures to reduce the risks of flood damage. The Floods Directive was transposed into Irish law by the European Communities (Assessment and Management of Flood Risks) Regulations, 2010 (S.I. No. 122 of 2010). The Regulations identify the Office of Public Works (OPW) as the lead agency in implementing flood management policy in Ireland.

Catchment Flood Risk Assessment and Management (CFRAM) Studies

For the purpose of delivering on the components of the National Flood Policy and on the requirements of the European Union Floods Directive, the OPW, in conjunction with local authorities and stakeholders, is conducting a number of Catchment Flood Risk Assessment and Management (CFRAM) Studies. These studies are the core activity from which medium to long-term strategies for the reduction and management of flood risk in Ireland will be achieved.

The overarching objectives of the CFRAM Studies are to:

- Identify and map the existing and potential future flood hazard within the study area;
- Assess and map the existing and potential future flood risk within the study area;
- Identify viable structural and non-structural options and measures for the effective and sustainable management of flood risk within the study area;
- Prepare Flood Risk Management Plans (FRMPs) setting out recommendations to manage the existing flood risk and also the potential future flood risk which may increase due to climate change, development, and other pressures that may arise in the future. FRMPs will set out policies, strategies, measures and actions that should be pursued by the relevant bodies (including the OPW, Local Authorities and other Stakeholders), to achieve the most cost-effective and sustainable management of existing and potential future flood risk within the study area, taking account of environmental plans, objectives and legislative requirements and other statutory plans and requirements¹.

¹ The Floods Directive requires that Flood Risk Management Plans should take into account the particular characteristics of the areas they cover and provide for tailored solutions according to the needs and priorities of those areas, whilst promoting the

The programme for the delivery of flood risk management in Ireland comprises of the following phases:

- Preliminary Flood Risk Assessment, which was completed in 2011, identified areas of existing or foreseeable future potentially significant flood risk (referred to as 'Areas for Further Assessment'/AFAs);
- CFRAM Studies, which are being completed in the period 2011 to 2016;
- By June 2016 Flood Risk Management Plans will be produced for each CFRAM study;
- The Flood Risk Management Plans will be implemented from 2016 onwards and will be reviewed on a rolling six-yearly cycle.

It should be noted that the detailed designs for flood risk management measures will not be developed as part of the Flood Risk Management Plans / CFRAM Studies but rather measures will be progressed on a scheme by scheme basis, outside of the scope of the CFRAM studies.

The OPW has commissioned a CFRAM study for each of Ireland's seven River Basin Districts (RBDs)². This report is an Appropriate Assessment produced in accordance with the Habitats Directive and pertains to the South Western River Basin District.

achievement of environmental objectives laid down in Community legislation.

² River Basin Districts (RBDs) are the main units for the management of river basins and have been delineated by Member States under Article 3 of the Water Framework Directive (2000/60/EC). RBDs are areas of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters.

2 Appropriate Assessment

2.1 Statutory Requirement for Appropriate Assessment

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) is European Community legislation regarding nature conservation. The intention of the Directive is to aim to ensure biodiversity through the conservation of natural habitats and wild fauna and flora in Europe. The Habitats Directive was transposed into Irish law by the European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94/1997) which was subsequently revoked and replaced by the European Communities (Birds and Natural Habitats) Regulations 2011.

A network of sites of conservation importance hosting habitats and/or species identified in the Directives as needing to be either maintained at or returned to favourable conservation status have been identified by each Member State. These sites are known as the Natura 2000 network and in Ireland, Natura 2000 sites comprise areas designated as Special Areas of Conservation (SACs) and candidate Special Areas of Conservation (cSACs), and/or Special Protection Areas (SPAs) and candidate Special Protection Areas (cSPAs).

The Habitats Directive requires that where a plan or project is likely to have a significant effect on a Natura 2000 Site, while not directly connected with or necessary to the nature conservation management of the site, it shall be subject to 'Appropriate Assessment' to identify any implications for the site in view of the site's conservation objectives³.

Specifically Article 6(3) of the Habitats Directive states:

*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to **appropriate assessment** of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

The CFRAM studies will identify viable strategies and measures for flood risk management in Ireland, some of which will be within areas designated under the Natura 2000 network. The Flood Risk Management Plans developed under these studies **are not directly connected with or necessary to the management of any Natura 2000 sites**. Therefore, in the context of the Habitats Directive, the Plans must be subjected to Screening for Appropriate Assessment to determine whether the strategies or measures outlined therein are likely to have a significant effect on a Natura 2000 site, either alone or in

³ The NPWS is currently developing Conservation Management Plans for all SACs nationally. Objectives for the conservation of the features of interest for which the site is designated are set out in the Conservation Management Plans and the principal pressures impacting the achievement of Favourable Conservation Status are identified. Strategies to meet the objectives are also identified.

combination with other plans or projects. Where significant effects are determined to be likely the Plans are statutorily required to be subjected to Appropriate Assessment.

2.2 Appropriate Assessment – The Process

The European Commission in 2002 published guidance on the assessment of plans and projects significantly affecting Natura 2000 sites. This guidance provides details of the general approach to Appropriate Assessment. The guidance sets out a tiered/staged approach as summarised below:

Stage 1 - Screening for a likely significant effect: An initial assessment of the project or plan's effect on a European site(s). A description of the plan/project and the elements that have the potential to impact on Natura 2000 sites must be provided. The potential impacts and their significance must be assessed. If it cannot be concluded that there will be no significant effect upon a European site, an Appropriate Assessment is required; (*Note this report is a Stage 1 Screening Assessment*).

Stage 2 - Appropriate Assessment: The consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts. The output of this stage of Appropriate Assessment is a Natura Impact Statement (NIS) report;

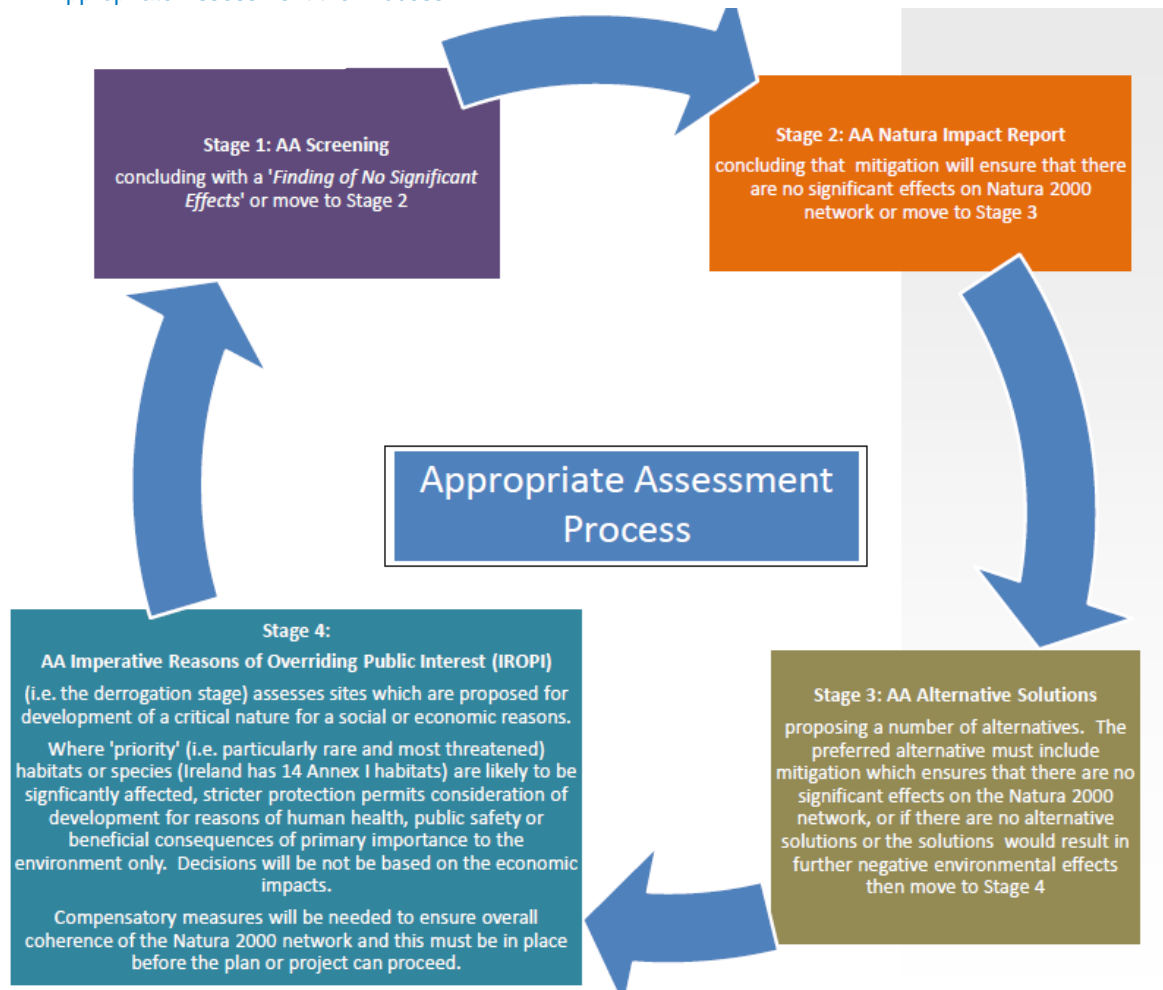
Stage 3 – Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site (where mitigation cannot be achieved); and

Stage 4 – Assessment where no alternative solutions exist and where adverse impacts remain: Development of compensatory measures where, in the light of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

Each stage in the process determines whether a further stage is required. If, for example, the conclusions at the end of Stage 1 are that there will be no significant impacts on the Natura 2000 site, there is no requirement to carry out an Appropriate Assessment (Stage 2). The approach to Appropriate Assessment screening must however apply the precautionary principle i.e. where it cannot be definitively determined that a plan/project will not adversely impact the integrity of the Natura 2000 site then it must be assumed that there is potential for impact and a full Appropriate Assessment must be carried out.

The objective of the process is to provide adequate information, based on the best available scientific information, to inform the Competent Authority to enable them to conduct an assessment of whether the plan or project is likely to have a significant effect on the conservation objectives of the relevant Natura 2000 sites within the zone of influence. Where adverse impacts are identified mitigation measures necessary to avoid, reduce or offset such impacts must be prescribed.

Figure 2-1 Appropriate Assessment the Process



Source: West Regional Authority (WRA) in association with the Environmental Protection Agency (EPA) (2013) Draft 'SEA Resource Manual for Local and Regional Authorities'

2.3 Objective of Appropriate Assessment Screening

The objective of this Stage 1 Screening Assessment is to determine whether the South Western RBD Flood Risk Management Plans are likely to have adverse impacts on conservation objectives of Natura 2000 sites. The direct, indirect and in-combination ecological impacts of the proposed plan policies / measures on Natura 2000 sites are identified and the necessity to carry out a Stage 2 Appropriate Assessment is determined. The findings of this Stage 1 Screening Assessment are documented through this Screening Statement. The outcomes of the assessment are also summarised in a 'Screening Matrix' presented in Section 6.

The DEHLG Guidance (2009), '*Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*' requires that the findings and recommendations of Appropriate Assessment informs the policies and strategies of the Plan.

Information contained in the Appropriate Assessment that will inform the South Western RBD Flood Risk Management Plans (FRMP) includes the following;

- the areas likely to be significantly affected by the plan;
- any existing environmental characteristics which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;
- the environmental protection objectives and qualifying interests (established at international, Community or Member State level) which are relevant to the areas of the environment likely to be affected by the plan;
- the likely significant effects on the Natura 2000 sites, such as impacts on biodiversity, fauna, flora, soil, water, etc.
- the measures envisaged to mitigate against any significant adverse effects on the designated sites of implementing the plan; and
- alternatives to the proposals in the plan and their potential effectiveness in maintaining the conservation value of the site.

2.4 Methodology

This screening assessment has been prepared in accordance with all relevant guidance and legislation including:

- European Communities (Birds and Natural Habitats) Regulations 2011;
- NPWS (2012) Marine Natura Impact Statements in Irish Special Areas of Conservation. A Working Document.
- DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities [revised, February 2010];
- EC (2000) Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC;
- EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC: Clarification of the concepts of alternative solutions and imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission.

An extensive data collection exercise was conducted as part of this Appropriate Assessment Screening. Available information utilised in the preparation of this report includes:

- Conservation Status Assessment Reports⁴ (CSARs), Backing Documents and Maps prepared in accordance with Article 17 of the Habitats Directive;

⁴ Every six years, Member States of the European Union are required to report on the conservation status of all habitats and species listed on the annexes of the Habitats Directive as required under Article 17 of the Directive. Ireland submitted our conservation

- Natura 2000 Site Synopsis, Data Forms and Conservation Objective Reports available from NPWS;
- Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual reports, Species Action Plans and Conservation Management Plans;
- Existing relevant mapping and databases e.g. waterbody status, species and habitat distribution etc. (sourced from the Environmental Protection Agency - <http://gis.epa.ie/>, the National Biodiversity Data Centre - <http://maps.biodiversityireland.ie> and the National Parks and Wildlife Services - <http://www.npws.ie/mapsanddata/>).

2.5 Statement of Authority

This Screening for Appropriate Assessment was prepared by Rita Mansfield. Rita is a Senior Ecologist [BSc. (Hons) Applied Ecology, University College Cork, 2003 and H.Dip Environmental Protection and Pollution Control, Sligo Institute of Technology, 2008] with over ten years' post graduate experience in public and private sector projects with the main focus being public infrastructure (water and waste water, roads, power). Rita has managed numerous Ecological Impact Assessments, Appropriate Assessments and environmental feasibility assessments of complex projects and land use plans. Rita has prepared ecological monitoring and mitigation guidance for the NRA for inclusion in their PPP and DB Contracts. Rita has undertaken and managed a wide range of field surveys including protected species surveys (e.g. badger, otter, red squirrel, bats, wetland birds, kingfisher, crayfish and lamprey), habitat surveys and biological and physicochemical water quality monitoring and habitat mapping.

2.6 Consultation

A National Workshop on Appropriate Assessment (AA) of Flood Risk Management Plans (FRMP) was held between the Office of Public Works (OPW), their consultants on the CFRAMs projects and the National Parks & Wildlife Service (NPWS) on the 28th January 2015. The NPWS outlined their expectations of the AA for the FRMPs as follows:

- The zone of influence of flood risk management options should be identified on a case by case basis using the Source-Pathway-Receptor approach;
- Any mitigation prescribed in the NIS should be specific and should be demonstrated to be achievable and effective;
- Consideration should be given to the construction impacts at Plan level;
- Appropriate Assessment must be based on scientific evidence;
- If an option for one AFA needs to go to IRPOI then it may be the case that the entire FRMP will need to go through IROPI;
- Care needs to be taken in how the fresh water pearl mussel is considered.

3 Description of the Plan

3.1 Flood Risk Management Plan

The Floods Directive [2007/60/EC] requires the establishment of a framework of measures to reduce the risks of flood damage. Catchment Flood Risk Assessment and Management (CFRAM) Studies have been commissioned to determine flood hazard and identify risk receptors that are susceptible to flooding in Ireland. Measures to mitigate risk (both existing and future) must also be determined. The outputs of the CFRAM studies are Flood Risk Management Plans (FMRPs). The purpose of the FMRPs are to set out policies, strategies, measures and actions that should be pursued by the relevant bodies to achieve the most cost-effective and sustainable management of existing and potential future flood risk.

One Flood Risk Management Plan will not be developed for the entire South Western River Basin District but rather, targeted individual plans will be produced on a waterbody catchment basis (Units of Management basis). The South Western River Basin District is therefore broken down into Units of Management (UoMs) for the purpose of implementing the Floods Directive.

UoMs are representative of existing Hydrometric Area boundaries constituting major catchments or river basins typically greater than 1,000km² and their associated coastal areas, or conglomerations of smaller river basins and their associated coastal areas.

Flood Risk Management Plans for each Unit of Management (UoM) in the South Western River Basin are due to be published in 2016.

The FRMPs shall include a prioritised set of actions and measures aimed at meeting defined flood risk management objectives for each UoM. The flood risk management objectives are set out under four categories (Technical, Economic, Social, and Environmental), and include objectives such as:

- Minimise health and safety risk of flood risk management options;
- Manage risk to agricultural land;
- Minimise risk to social amenity;
- Minimise the risk of environmental pollution;
- Avoid damage to, and where possible enhance, fisheries within the catchment.

A description of the flood risk management objectives which are particular to each UoM will be included in the Flood Risk Management Plans.

The Flood Risk Management Plans will demonstrate the indicative costs and benefits of the preferred actions and measures, the robust reasoning for the identification of a measure as a preferred option and the priority each measure should be afforded. The plans shall also recommended a programme of work (including a prioritised and costed programme of policies, strategies, actions and measures) to be implemented by the OPW, Local Authorities or other relevant bodies to mitigate flood risk in each UoM.

The FRMPs will influence, and will in turn be influenced by external statutory and non-statutory plans, strategies and policies and programmes. National and local policies relating to the protection of the environment must be considered in the development of the FRMPs. This process is conducted as part of the Strategic Environmental Assessment of the FRMPs.

3.2 Overview of the South Western River Basin District

The South Western River Basin District (SWRBD) covers an area of approximately 11,160 km² and includes most of county Cork, large parts of counties Kerry and Waterford along with small parts of the counties of Tipperary and Limerick. The SWRBD contains over 1,800 km of coastline along the Atlantic Ocean and the Celtic Sea.

Figure 3-1 South Western River Basin District (SWRBD)



3.2.1 Units of Management in the SWRBD

There are five Units of Management within the South Western River Basin District which follow watershed catchment boundaries rather than political boundaries. The Units are as follows;

- The Munster Blackwater Catchment (UoM18)
- The Lee / Cork Harbour Catchment (UoM19)

- The Bandon / Skibbereen Catchment (UoM20)
- The Dunmanus / Bantry / Kenmare Bay Catchment (UoM21)
- The Laune / Maine / Dingle Bay Catchment (UoM22)

UoMs are further broken down in to Areas for Further Assessment (AFAs). The SWRBD includes 26 Nr. Areas for Further Assessment (AFAs).

Figure 3-2 Units of Management and Areas for Further Assessment in the SWRBD



3.3 Flood Risk Management Options

The CFRAM study for the SWRBD is currently at the *options appraisal stage*, to identify the preferred measures and options to manage flood risk for each UoM in the SWRBD. Receptors to flood risk within each UoM in the SWRBD have been identified through detailed technical studies. The potential options to manage the flood risk of the various receptors have provisionally been identified and are currently being assessed for viability.

A flood risk management option consists of one, or more commonly a combination of, flood risk management measures. The suite of flood risk management options for consideration under the CFRAM study are presented in Table 3.1.

Table 3.1: Suite of Flood Risk Management Options

Option	Description
Do Nothing	Implement no new flood risk management measures and abandon any existing practices.
Existing Regime	Continue with any existing flood risk management practices, such as reactive maintenance.
Do Minimum	Implement additional minimal measures to reduce the flood risk in specific problem areas without introducing a comprehensive strategy - infill gaps in existing walls, maintain channel.
Non-Structural Measures	<p>Planning and development control measures (zoning of land for flood risk appropriate development, prevention of inappropriate incremental development, review of existing Local Authority policies in relation to planning and development and of inter-jurisdictional co-operation within the catchment, etc.);</p> <p>Building regulations (regulations relating to floor levels, flood-proofing, flood resilience, sustainable drainage systems, prevention of reconstruction or redevelopment in flood-risk areas, etc.);</p> <p>Sustainable urban drainage systems (SUDS);</p> <p>Installation of a flood forecasting and warning system and development of emergency flood response procedures;</p> <p>Targeted public awareness and preparedness campaign;</p> <p>Individual property flood resistance (protection / flood-proofing) and resilience;</p> <p>Land use management, including creation of wetlands, riparian buffer zones, etc.</p>
Structural measures	<p>Storage (single or multiple site flood water storage, flood retardation, etc.)</p> <p>Flow diversion (full diversion / bypass channel, flood relief channel, etc.)</p> <p>Increase conveyance (in-channel works, floodplain earthworks, removal of constraints / constrictions, channel / floodplain clearance, etc.)</p> <p>Construct flood defences (walls, embankments, demountable defences, etc.)</p> <p>Rehabilitate, improve existing defences</p> <p>Relocation of properties</p> <p>Localised protection works (e.g. minor raising of existing defences / levels).</p>
Channel or Flood Defence Maintenance Works / Programme	-
Other relevant works	-

Flood risk management options have been developed for each UoM in the SWRBD. All of the available options from the prescribed suite (Table 3.1) are not applicable to every UoM. Options appraisal involves the technical assessment⁵ of all options to determine those which are applicable and viable for each UoM and associated AFAs. Following the technical assessment a cost analysis of the viable options is conducted such that a preferred option (in terms of effectiveness, potential impacts, and cost) is determined.

The options proposed in the Flood Risk Management Plans are set at an appropriate scale which includes the following levels:

⁵ The effectiveness and potential impacts of each FRM option is considered in terms of the following criteria:

- Applicability to the area
- Economic (potential benefits, impacts, likely costs etc.)
- Environmental (potential impacts and benefits)
- Social (impacts on people, society and the likely acceptability of the method) and
- Cultural (potential benefits and impacts upon heritage sites and resources)

- Units of Management (UoM) – i.e. at river basin catchment level;
- Analysis Unit (AU) - these are sub-catchments or coastal areas within the Unit of Management;
- Areas for Further Assessment (AFAs) - these are communities within an individual UoM with a quantifiable flood risk and include towns, villages and areas where significant development is anticipated. Associated with AFAs are high and medium priority watercourses. High priority watercourses are located within and 2km upstream of AFAs whereas medium priority watercourses are the interconnecting watercourses between AFAs⁶.

3.4 The Dunmanus-Bantry-Kenmare Bay Catchment (UoM21)

The Dunmanus / Bantry / Kenmare Bay UoM covers an area of approximately 1,890 km² and is split between counties Cork and Kerry. The main rivers within UoM 21 are the Cumberagh, Inny and the Roughty. UoM 21 also includes a number of large lakes including Lough Currane and Derrianna Lough.

Bantry and Castletown Bearhaven AFAs

There are three distinct hydrological catchments in the Bantry AFA. The Mealagh catchment to the north of Bantry Town is a reasonably large catchment covering 56km². The River Mealagh rises in the uplands of the Maughanaclea Hills (113240, 053930) and flows approximately 10km to the west before skirting around Drombrow Lough and entering the Bantry AFA. The Mealagh flows through the town of Dunmark before passing through Dunmark Bridge and down a steep section into the tidally affected harbour. There is a small ridge to the west of Drombrow Lough that forms a low barrier between the Lough and the Mealagh. The water in the Lough flows into the Mealagh by a small channel that has its confluence to the northeast, away from the AFA. In the area near to the AFA, where there is a risk of flooding from tributaries to the Mealagh, there are the Raheen Beg, Doneelagh, Milleencolla East and Milleencolla West streams. Flooding from the Ardnageehy tributaries in the upper reaches of the Doneelagh Stream has been shown during the course of this study to flow to the west, into the River Bantry catchment and not, as expected to the northeast into Doneelagh Stream.

Bantry Town itself resides in the River Bantry catchment, the middle hydrologically distinct catchment in the Bantry AFA. The River Bantry is 2.2km long, rises near Ardnageehy More (101050, 048450) and flows along a fairly steep channel (a gradient of up to 1 in 30) before passing into a tidally influenced culvert under Chapel Street in Bantry. The culvert passes under Bantry town centre and terminates in an outfall into Bantry Harbour. The River Bantry is joined by five tributaries: the Knocknaveagh, Sheskin East, Carrignagat, Dromleigh and Reenrour tributaries. The four tributaries to the south of Bantry River, the Knocknaveagh, Sheskin East, Carrignagat and Dromleigh, are all narrow and steep channels with many engineered sections, including culverts, weirs, bridges and aqueducts. The Reenrour Stream is the largest tributary to Bantry River and it has a shallower gradient of approximately 1 in 50. The lowest reach of the Reenrour is culverted and has a junction with Bantry River in the long culvert beneath Bantry Town.

⁶ The designation of a watercourse as high priority or medium priority is not a reflection of how the watercourse is viewed in terms of its importance in flood risk management planning.

The third hydrological catchment in the Bantry AFA contains the Kilnaruane and Dromacoosane Rivers which flow through a predominantly rural area on the coast to the south of Bantry.

Bantry Bay is a narrow tidal bay which extends from Dursey Island inland to Ballylicky and the Owvane River outfall. Bantry Bay has a number of islands which modify the tidal current and provide some protection to the mainland from incoming storm waves. These islands include Bear Island at Castletown Bearhaven and Whiddy Island at Bantry. Castletown Bearhaven Harbour is further protected from extreme waves by Dinish Island which is a low lying extension of the Castletown Bearhaven port with low sea walls protecting the quayside.

Durrus AFA

The Durrus River runs approximately 10km from its source in the Coomnagoragh Mountain range (0102200, 044770). At Ballycommene it is renamed Four Mile Water and continues as an open channel to Dunmanus Bay. The Four Mile Water River is tidally influenced as far upstream as the waterfall at (094730, 042040), 500m upstream of Carrigboy Bridge. The only tributary to Four Mile Water is the Ahanegavanagh Stream which flows southwards from the Coomkeen area (094480, 044850) to Dunmanus Bay, joining the Four Mile Water River in the tidally influenced reach downstream of Durrus town.

Dunmanus Bay is the smallest and narrowest of the three bays considered in UoM21. It extends from Mizen Head to Four Mile Water at Durrus. The Bay is characterised by steep cliffs along the headlands but develops more estuarine tidal bars at Four Mile Water outfall. Durrus AFA is actually located some distance from the tidal outfall of Four Mile Water, and well above the extreme coastal conditions. Therefore, flooding from coastal sources has not been assessed at Durrus for the CFRAM study.

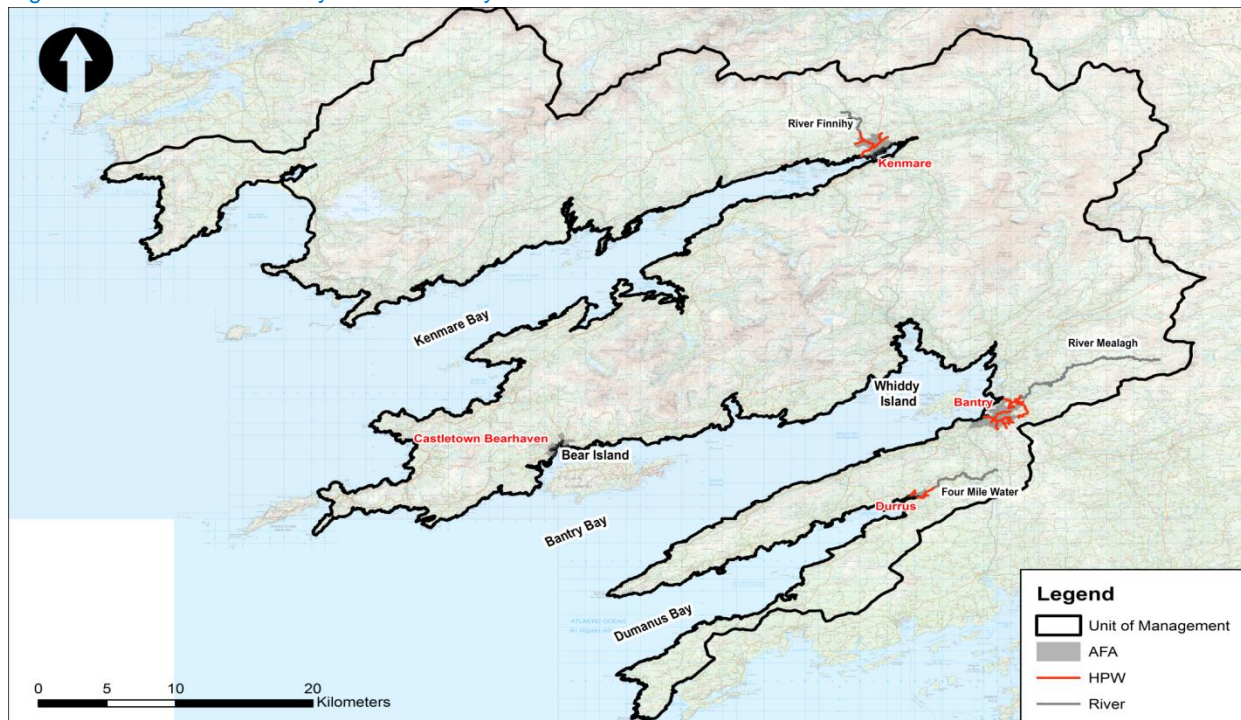
Kenmare AFA

The River Finnihy flows from Barfinnihy Lough at 084950,076590 down a very steep channel before being joined by a number of small tributaries, and flowing south-eastwards towards Kenmare. Within the town, the River Finnihy flows over a waterfall 300m upstream of Finnihy Banks estate, and is joined by the Lissaniska tributary immediately upstream of Finnihy Bridge. The river channel then meanders to the west, under Cromwell's Bridge and continues to outfall into Kenmare Bay/River at 090030,070190. The River Finnihy is tidally influenced as far as Cromwell's Bridge under typical tidal conditions but the tidal influence can extend beyond Finnihy Bridge under extreme high tides. The only other tributary considered in Kenmare is Gortamullen Stream which drains the bog land to the north of the N70. The Gortamullen Stream rises at 089802,071366 and then splits flow between the Claddanure catchment to the west and the Finnihy catchment to the east. The eastern branch flows down a stream reach (a gradient of 1 in 55) before entering a long culvert at the N70 (090208,071500) to join the River Finnihy immediately downstream of the waterfall.

Kenmare Bay known as Kenmare "River" is protected under the Natura 2000 act as a Special Area of Conservation for its shallow inlets and varying shoreline cliffs and dune areas. It narrows towards Kenmare into "The Sound" inland of the N71 crossing. The Sound is characterised by more estuarine features including a series of in-channel bars and tidal channel loops. The low tide channel width and

shape is highly variable in this dynamic fluvial-tidal environment and varies from channel widths of 50m to 195m. There are also low lying areas at Reennagross which are covered by high spring tides.

Figure 3-3 Dunmanus / Bantry / Kenmare Bay UoM 21



3.4.1 Areas for Further Assessment in UoM 21

The Dunmanus / Bantry / Kenmare Bay UoM contains four contains four Areas for Further Assessment (AFAs). Associated with the AFAs is over 25km of high and medium priority watercourse.

Table 3.2: List of AFAs in the Dunmanus / Bantry / Kenmare Bay UoM

AFA Name	Unique ID	Fluvial Flooding	Coastal Flooding	County	Easting	Northing
Bantry	210307	Yes	Yes	Cork	99750	48500
Castletown Bearhaven	210308	No	Yes	Cork	68000	46000
Durrus	210309	Yes	No	Cork	95000	42000
Kenmare	210312	Yes	Yes	Kerry	90750	70500

3.5 Flood Risk Management Options for the Dunmanus / Bantry / Kenmare Bay UoM

Flood risk management options for the Dunmanus / Bantry / Kenmare Bay UoM have been identified through option appraisal. Non-structural and structural options (as described in Table 3.1 of this report) will be combined to reduce the risk of damage to properties from flooding. Structural options are not viable for all AFAs however non-structural measures can be applied on a UoM basis.

This Appropriate Assessment Screening is carried out in conjunction with the option appraisal process such that potential environmental impacts of the various options are considered at option selection stage.

3.5.1 Non-Structural Measures

Planning Control

STANDARD TEXT WILL BE PROVIDED

Building Regulations / Planning Conditions

The risk of damage to properties from flooding can be mitigated by the use of appropriate construction techniques and materials. For example the damage caused to an internal wall of a property by flooding can depend on the materials and methods of its construction. A timber stud partition covered with plasterboard with low level electrical wiring would have to be completely replaced following immersion in flood water. However, a solid concrete block wall covered with tiles and high level electrical wiring on the other hand would only have to be washed down following a flood.

If for a particular town or high flood probability areas, certain building regulations or planning conditions were adopted that ensured structures were flood resilient through specified construction methods, building fabrics and uses, a decrease in the risk of damage could be achieved. The question of whether such regulations or planning conditions could be imposed upon developers, business owners or householders in flood prone areas would need to be addressed if this were to be brought forward as a flood risk management measure.

Flood Forecasting

Flood forecasting is a means of providing advanced warning of an impending flood event. A reliable advance warning system allows protective measures to be put in place and protective actions to be carried out in advance of a flood event. These actions and measures can reduce the damage caused in a flood event.

Flood forecasting is not a viable Flood Risk Management Measure for all of the UoM 21 AFAs. This is because the time between transmitting a flood forecast the arrival of flood waters may not be long enough for people to take effective action to reduce flood damage. Flood warning is a viable option in the Castletownbere, Bantry and Kenmare AFAs. The infrastructure required for flood forecasting in these AFAs are listed in Table 3.3.

Table 3.3: Flood Forecasting Infrastructure required

AFA	Infrastructure
Castletownbere Tidal	Subscribe to OPW Surge forecast system
Kenmare Tidal	Subscribe to OPW Surge forecast system
Bantry Fluvial (on the Meelagh)	Rain Gauges
	River Level Gauges
	Flood Forecasting model and warning infrastructure
Bantry Tidal	Subscribe to OPW Surge forecast system

Public Awareness

Many of the measures to mitigate and manage flood risk and the potential consequences for flooding will involve the public at large. It is therefore important that the public is made aware of where to find information, what the information means and what actions the public and business owners can take to reduce the damage that would occur to their properties, possessions and interests in the event of a flood.

Measures to increase and promote public awareness include:

- Identifying the areas prone to flooding
- Information on measures to be implemented to reduce and / or manage the risk of flooding
- Measures in place to provide advance warning of flooding
- Establishment of methods to interface with the public and in particular the owners of vulnerable properties, i.e. workshops and meetings, Facebook, Twitter, text messaging, newsprint, websites, etc.

Land Use Management

Land Use Management includes strategies to control overland flow, such as improving agricultural and forestry practices in key catchment areas. Local natural flood management measures such as the creation of wetlands or forestry to retain overland flow could also be adopted.

Emergency Response Planning

STANDARD TEXT WILL BE PROVIDED

3.5.2 Structural Measures

Structural flood risk management options for the Dunmanus / Bantry / Kenmare Bay are shown in Table 3.4. Options are presented in terms of the viable options considered for each AFA. Figures showing the viable flood risk management options are included in the Preliminary Options Report. It should be noted that these figures are indicative only. The locations in which viable options may be constructed within the AFAs may change at detailed design stage if an option is progressed through a scheme.

A preferred option for the AFAs will emerge following technical assessment and cost analysis of the viable options and following input from members of the public. Public input is gained through Public Consultation in December 2015 and January 2016.

Table 3.4: Structural Flood Risk Management Options for UoM 21

AFA	Viable Options
Bantry	<ul style="list-style-type: none"> Flood defences and road raising - flood embankments in Caherdaniel West and Newtown and tidal walls in Bantry town couples with road raising on the N71. Flood defences and tidal barrage – flood embankments in Caherdaniel West and Newtown and tidal barrage in the harbour with an inner area of approximately 78,880m². The barrage will need to be closed at the low tide preceding a tidal event in order to accommodate fluvial flows. The barrage would remain closed until the tide level outside is lower than the maximum water level within the barrage 9modelled as being approx. 9 hours).
Castletownbere	<ul style="list-style-type: none"> Walls and Flood Barriers
Durrus	<ul style="list-style-type: none"> No measures are proposed.
Kenmare	<ul style="list-style-type: none"> Flood defences including walls, embankments, road raising and flood gates Storage on the Finnihy River coupled with flood defences Removal of a foul sewage pipe from across the eye of Finnihy Bridge coupled with flood defences

3.6 Flood Risk Management Options with Potential for Significant Effects on Natura 2000 Sites

Flood risk management measures, while having a positive social impact can have a negative environmental impact. The requirement for ecological protection can limit potential options for flood risk management. The South Western River Basin District contains a variety of habitats and species of conservation concern which are protected under national and European legislation. A flood risk management option is unlikely to emerge as the preferred option for an AFA where there is an associated significant impact on species or habitats for which Ireland has designated areas for their protection (i.e. Natura 2000 Sites).

The potential impacts of the structural and non-structural flood risk management options for UoM 21 are characterised hereunder.

3.6.1 Potential Impacts of Non-Structural Options in UoM 21

Periodic high (flood) and low (drought) flows are a natural element of river hydrology. The flora and fauna inhabiting a watercourse and its riparian zone will be adapted to the natural variation in flow and level which is typical of the system. An extreme flood event, outside of the river systems normal range, can have negative impacts on the ecology of the watercourse as follows:

- Prolonged submergence of riparian flora can result in damage to and loss of species, this can provide opportunity for colonisation by invasive species;
- Increase pollution of the watercourse due to high levels of runoff from land and increased erosion of river banks due to high flow velocities can lead to high sedimentation in the river which can have subsequent negative impacts on fishery habitat;
- Reduced biomass in the watercourse due to the washing out of macroinvertebrates and detritus which has subsequent impacts on populations of consumers in the watercourse;

With the exception of Land Use Management, non-structural measures will not restrain the flow of water during an extreme flood event. The implementation of these measures cannot therefore influence the current frequency, extent or depth of flooding. Impacts on an ecosystem from an extreme flood event will not be prevented by the implementation of non-structural measures. Non-structural measures can however prevent future exacerbation of flooding by ensuring that development within the catchment will not increase runoff to the watercourse through Planning Control.

Land Use Management aims at retaining / delaying runoff within a catchment such that a sudden increase in flows in a watercourse is not experienced / is limited. This option can have the effect of reducing the depth and extent of a flood event. There will be an associated reduction in the potential negative impacts on ecology. Land Use Management provides an opportunity to increase biodiversity through creation of woodland or wetland habitat in place of agricultural lands. This can have a long term positive impact.

Flood Forecasting requires the installation of gauges along a watercourse to measure level and flow. Typically river gauges are installed within a housing (usually a PVC pipe) strapped to a bridge. The bridge acts as a supporting structure to the gauge housing, thereby eliminating the requirement for bankside works. It is not always practical to site a river gauge at the location of a bridge, in which case a bank-side structure is required to support the gauge. The installation of a gauge and supporting structure can have the following impacts on the watercourse:

- permanent removal of riparian vegetation to accommodate the support structure;
- temporary disturbance of river bank and river bed during installation resulting in the release of sediment into the watercourse which can cause temporary deterioration in the quality of fishery habitat and can smother immobile flora and fauna in the watercourse;
- release of concrete into the watercourse (where the structure is not prefabricated) which can result in reduced water quality with subsequent negative consequences for the ecology of the watercourse;
- temporary noise and physical disturbance to species in proximity to the gauge site during installation;
- alteration of water turbulence / flow pattern in the immediate vicinity of the gauge structure which can result in a change in erosion / deposition pattern locally and therefore a change in habitat.

3.6.2 Potential Impacts of Structural Options in UoM 21

The viable structural options identified for the management of for the extreme flood event within the UoM can be summarised as Storage, Conveyance Measures (removing pipe from Finnihy Bridge in Kenmare), Flood Walls and Embankments, and Tidal barrage. The potential impacts associated with each viable structural option are presented hereunder.

Storage

Storage is provided upstream of a flood risk area in order to limit the flow in the downstream watercourse such that it does not overtop its banks. The storage area will come in to operation in times of flood flows. Implementation of flood storage requires the availability of land upstream of the flood risk area with suitable topography which can be allowed to flood during flood conditions in the river. A storage area / reservoir is typically formed by constructing earth embankments perpendicular to the course of the river coupled with a control structure on the watercourse which will limit flows to that which can be accommodated downstream. The storage area is designed such that during flood flows the watercourse will overtop its banks into the surrounding lands within the storage area (which is contained by the earth embankments) and the control structure will ensure that flows downstream are maintained at levels which will not overtop the banks.

Flood Storage has been assessed as a viable option for the Finnihy River in Kenmare comprising a 32,150m² area in an agricultural setting. A 6m high earth embankment is proposed as the retaining structure coupled with a control structure.

Construction of the flood storage area will require that earth is brought to site for embankment construction. Potential significant environmental effects associated with the construction of embankments include:

- Sedimentation of the Finnihy River. Sediment deposition in a watercourse can cause a temporary to short term reduction the quality of fishery habitat by infilling interstitial spaces in gravel beds. Sedimentation can reduce light penetration in the water column and can affect oxygen levels both in the river bed and in the free moving water thereby impacting river vegetation and river fauna. Sedimentation can block the gills of in-stream fauna..
- Introduction of invasive species, e.g. Japanese Knotweed, in the earth imported to site.

The storage areas will require a control structure (sluice gate / penstock) to be installed on the watercourse to ensure downstream flows are maintained below extreme flood levels. The installation of the control structure will require in-stream works. Installation of a sluice gate / penstock requires that bed and bank material is excavated and the section is replaced by a concrete channel and walls such that the control structure can be anchored to the concrete. Potential significant environmental effects associated with the installation of the control structure include:

- Permanent loss of river bed and river bank within the footprint of the control structure;
- Damage to river bed and bank due to machinery movement in-stream;
- Release of sediment in to the watercourse during installation caused by disturbance to river bed and banks (sedimentation effects are discussed in relation to the embankments above);
- Obstruction to fish / lamprey passage within the river channel when the control structure is restricting flows;
- Isolation of fish / lamprey within the flooded storage area in the event that flood waters subside rapidly;
- Creation of temporary wetland habitat within the storage area during flooding;

Conveyance Measures

Conveyance Measures involve the physical alteration of a river channel or floodplain to improve flood flow throughput. The removal of the foul sewer pipe from across the eye of the Finnihy Bridge is a conveyance measure. Potential environmental effects of removing the pipe from across the eye of the bridge include:

- Disturbance of river bank and bed where in-stream works are required in order to access the pipe;
- Pollution of the watercourse by accidental release of foul sewage which may be within the section of pipe to be diverted.

Flood Walls and Embankments

Flood Walls and Embankments are physical structures designed to contain floodwaters for a defined flood event. Floodwalls can be constructed from a variety of materials including concrete, brick / stone masonry and steel. Embankments are typically constructed from earth which is vegetated to protect against erosion.

The construction of flood walls and embankments has been determined to be a viable option in Bantry, Castletownbere and Kenmare. The physical implementation of these structural measures can have the following environmental effects:

- Temporary release of sediment to the watercourse from embankments with subsequent effects on habitat quality;
- Compaction of riparian area due to weight of embankment and machinery movement during construction (note embankment design would need to consider ground stability).
- Introduction of invasive species, e.g. Japanese Knotweed, in the earth imported to site for embankments;
- Accidental spill of construction materials e.g. concrete for wall construction, which can have toxic effects on flora and fauna;
- Noise disturbance to species during construction.

Tidal Barrage

A tidal barrage is proposed for Bantry. The barrage will be a solid structure with a gate / penstock system to allow tidal conditions to operate as normal except in times of tidal flooding where the penstocks would close and the barrage would become impermeable. The barrage should be closed at low tide. This will facilitate adequate storage for fluvial flows from the Bantry Stream, the Knocknavaghnea stream, the Ardnageehy and Mileencoola East Streams. The barrage would require an inner area of approximately 78,880m² and a minimum barrage height of 2.98m. The barrage would be required to remain closed for approximately 9 hours during flooding. Potential impacts of constructing a barrage in Bantry Harbour include:

- Damage to habitat within the footprint of the barrage;
- Alteration of tidal inundation within the barrage during flooding (because barrage is closed) and change in salinity due to stronger fluvial influence when barrage is closed;
- Restriction of fish movement during barrage closure;
- Disturbance of estuary bed causing sediment plumes during construction;
- Noise impacts during construction;

4 Characteristics of Natura 2000 Sites

4.1 Natura 2000 Sites within the Zone of Impact

Viable flood risk management options have been determined for the AFAs of Kenmare, Castletownbere and Bantry.

- Flood risk management options in Kenmare are proposed for both the Finnihy River. Kenmare River SAC (002158) extends from the N71 road bridge crossing seaward as far as Dursey Island and Scariff Island and includes the tidal extent of the Finnihy River which stops approximately 200m short of the Finnihy Bridge. Flood risk management measures are proposed at the Finnihy Bridge and may extend to within the SAC.
- The Castletownbere AFA boundary does not overlap with any Natura 2000 site boundary. The nearest Natura 2000 site is the Beara Peninsula SPA (004155), which is approximately 3.5km south of Castletownbere.
- The Bantry AFA boundary does not overlap with any Natura 2000 site boundary.

There is potential that impacts as described in Section 3.6 of this Screening Assessment could affect the qualifying features of the Kenmare River SAC (002158) and the Beara Peninsula SPA (004155).

Kenmare River SAC (002158)

Kenmare River is a long and narrow south-west facing bay situated in the southwest of Ireland. The site includes very good quality examples of large shallow bays, reefs, and marine caves. Kenmare River is the only known site in Ireland for the Northern Sea-fan (*Swiftia pallida*) (which occurs near Sneem / Ardroom). Qualifying features of the SAC are: [1160] Large Shallow Inlets and Bays, [1170] Reefs, [1220] Perennial Vegetation of Stony Banks, [1230] Vegetated Sea Cliffs, [1330] Atlantic Salt Meadows, [1410] Mediterranean Salt Meadows, [2120] Marram Dunes (White Dunes), [2130] Fixed Dunes (Grey Dunes)*, [4030] Dry Heath, [6130] Calaminarian Grassland, [8330] Sea Caves, [1014] Narrow-mouthed Whorl Snail (*Vertigo angustior*) (found in Derrynane), [1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*), [1355] Otter (*Lutra lutra*) and [1365] Common (Harbour) Seal (*Phoca vitulina*).

Beara Peninsula SPA (004155)

The Beara Peninsula SPA is a coastal site situated on the west coast of Co. Cork, south-west of the town of Kenmare. It encompasses the high coast and sea cliff sections of the western end of the peninsula from Reenmore Point/Cod's Head in the north, around to the end of Dursey Island in the west, and to Bear Island in the south. The site is designated for Fulmar (*Fulmarus glacialis*) and Chough (*Pyrrhocorax pyrrhocorax*).

4.2 Likelihood of Impacts on Natura 2000 Sites

The likelihood of the potential impacts as described in Section 3.6 of this Screening Assessment affecting the qualifying features of the Kenmare River SAC (002158) and the Beara Peninsula SPA (004155) is determined through Source-Pathway-Receptor assessment.

A review of available data was carried out to determine the presence of qualifying features of the designated areas within the environs of Kenmare, Bantry and Castletownbere AFAs. Data reviewed included:

- Protected species spatial datasets for the SWRBD provided by NPWS
- Article 17 spatial data on protected habitats and species available through NPWS website
- Article 12 reporting data on breeding distributions and ranges of protected bird species available through NPWS website
- iWebs data
- National Survey of Native Woodlands 2003-2008 spatial data available through NPWS website
- Irish Semi-natural Grassland Survey spatial data available through NPWS website
- Coastal Monitoring Project 2004-2006 available through NPWS website
- Saltmarsh Monitoring Project 2006-2008 available through NPWS website
- Protected species data sourced through the National Biodiversity Data Centre

The likelihood of an impact occurring is characterised in accordance with the NRA (2009) classification:

- Near-certain: >95% chance of occurring as predicted
- Probable: 50-95% chance of occurring as predicted
- Unlikely: 5-50% chance of occurring as predicted
- Extremely unlikely: <5% chance of occurring as predicted

4.2.1 Bantry AFA

There is no potential for the flood risk management works in the Bantry AFA to impact upon Natura 2000 sites due to absence of connectivity to any Natura 2000 site. Bantry AFA is screened out from further assessment.

4.2.2 Castletownbere AFA

The Beara Peninsula SPA is approximately 3.5km south of Castletownbere. Flood walls and property defences are viable options to provide tidal flood protection within the town. The works will be confined to within the existing urban landscape. There is no potential for the destruction of habitats which support Flumar of Chough.

Disturbance to species is extremely unlikely given distance from site. The flight response distance (i.e. the point at which the bird moves away from a source of disturbance) varies between species, is greater during adverse weather, and depends on the acclimatisation of the birds to such disturbance. Wetland birds have been documented to tolerate noise levels at or below 70dB(A) (Institute of Estuarine & Coastal Studies, University of Hull, 2009). BS 5228-1:2009+A1:2014 prescribes typical noise level data for various construction plant and activities within 10m from source. The inverse square law⁷ can be applied to determine likely noise levels at varying distances from construction activities (Table 4.1).

⁷ Inverse Square Law – For every doubling of the distance from the noise source, the sound pressure levels will broadly be reduced by 6 decibels (dB)

Table 4.1: Noise Levels, dB(A), at Various Distances from Construction Activities

Distance from Source (m)	Tracked excavator	Mixing cement - large lorry concrete mixer	Dumper Truck (empty)	Dumper Truck (tipping fill)	Breaking concrete	Dozer	Wheeled Loading Lorry
10	78	77	87	79	96	81	80
20	74	73	83	75	92	77	76
40	68	67	77	69	86	71	70
80	62	61	71	63	80	65	64
160	56	55	65	57	74	59	58
320	50	49	59	51	68	53	52
640	44	43	53	45	62	47	46
1280	38	37	47	39	56	41	40
2560	32	31	41	33	50	35	34

Based on BS 5228-1:2009+A1:2014

From Table 4.1, noise generated during construction will have diminished to tolerable levels for wetland birds [70dB(A)] within 320m of the works.

Sediment release to the harbour is extremely unlikely given that the walls would be constructing within existing hardstanding areas along the coast.

4.2.3 Kenmare AFA

The viable flood risk management options for Kenmare are located within the town. It is extremely unlikely that the options will result in direct damage to Annex I habitat for which the SAC is designated given that these are primarily coastal habitats and the options will be implemented inland.

The SAC is designated for Narrow-mouthed Whorl Snail. The location of this population is Derrynane. It is highly unlikely that the construction of flood walls within Kenmare will impact whorl snail.

Kenmare River is designated for Lesser Horseshoe Bat. There are fourteen confirmed roosts for this species within a 6km radius⁸ of Kenmare (NPWS Data). The nearest roost is located approximately 1.5km from Finnihy Bridge. Disturbance to the roost by noise is extremely unlikely given the distance between the roost and flood risk management options. Lesser Horseshoe Bats normally forage in woodlands/scrub within 2.5km of their roosts (Schofield, 2008). It is highly unlikely that bat commuting or foraging would be affected by the implementation of defences and conveyance measures within the town given the location of these measures within an urban setting (Lesser Horseshoe Bats are highly unlikely to be foraging within this environment as they will avoid brightly lit areas).

⁸ Bat Conservation Ireland recommends a 6km zone of assessment such that impacts on foraging and commuting are accounted for.

The proposed Storage Area is located on the Finnihy River parallel to the N71 road immediately north of woodland habitat and immediately across the road from ribbon development housing. This location is approximately 2.48km from the nearest roosting site. Given the distance from the nearest roost site and given the presence of light sources at this location, it is unlikely that Lesser Horseshoe Bat forage at this location. Impacts on Lesser Horseshoe Bat foraging are unlikely.

Otter habitat as mapped in the Kenmare River Conservation Objectives Report represents a 10m terrestrial buffer along shoreline. This is not confirmed through field survey. The storage areas on the Finnihy River is outside of this buffer. It is unlikely that Otter use the habitat in proximity to the storage areas given that Otter would have to pass through the village in order to commute to the marine feeding areas. The removal of riparian habitat within the footprint of the structures of the storage areas is extremely unlikely to impact Otter.

The Finnihy River hosts a Freshwater Pearl Mussel population. This is not a qualifying feature of the Kenmare River SAC therefore there can be no impacts on the conservation objectives of the SAC by impacting this species.

DAHG Draft Guidance (2012) sets out measures to minimise the risk of noise related impacts on aquatic mammals caused by maritime sound-producing operations or activities. The guidance specifies that operations should not commence if marine mammals are detected within a 500m radial distance of dredging / drilling activities. The Kenmare River Conservation Objectives Report identifies breeding and molting sites for Common Seal. Viable options for flood management in Kenmare are concentrated on the Finnihy River and are located in excess of 500m from the harbour. Noise impacts on Seal are extremely unlikely.

4.2.3.1 Summary of Likely Impacts on the Kenmare River SAC and the Beara Peninsula SPA

No likely impacts have been determined on the Kenmare River SAC and the Beara Peninsula SPA from the implementation of viable options in the Kenmare AFA and the Castletownbere AFA.

5 Significance of Impacts on Natura 2000 Sites

5.1 General

The significance of an impact is relative to the existing condition/conservation status of a Natura 2000 site and to the scale of the impact in space and time.

Favourable conservation condition of an Annex I habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing,
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation condition of an Annex II species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Impacts are assessed as significant where the conservation objectives of a Natura 2000 site are undermined.

Where it is determined that a likely impact of the flood risk management options will have a significant impact on a Natura 2000 site, the flood risk management options must be assessed through full Appropriate Assessment. The precautionary principle must be applied in determining significance of an impact. Where the significance of an impact cannot definitively be ascertained on the basis of the information available it is required to progress to full Appropriate Assessment i.e. an option cannot be screened out unless there is certainty that no significant impact is likely.

5.2 Assessment of Significance

No likely impacts from the implementation of flood risk management options in Bantry, Castletownbere or Kenmare AFAs have been identified.

No likely significant effects on Natura 2000 sites are reasonably foreseeable as a result of the implementation of flood risk management measures in UoM 21.

6 Conclusions and Screening Statement

No likely significant effects on Natura 2000 sites are reasonably foreseeable as a result of the implementation of flood risk management measures in UoM 21.

Table 6.1: Screening Matrix for UoM 21

Screening Matrix	
Project	
Brief description of the project or plan	<p>Kenmare AFA:</p> <ul style="list-style-type: none"> Flood defences including walls, embankments, road raising and flood gates Storage on the Finnihy River coupled with flood defences Removal of a foul sewage pipe from across the eye of Finnihy Bridge coupled with flood defences <p>Castletownbere AFA:</p> <ul style="list-style-type: none"> Flood defences including walls and embankments <p>Bantry AFA:</p> <ul style="list-style-type: none"> Flood defences and road raising - flood embankments in Caherdaniel West and Newtown and tidal walls in Bantry town couples with road raising on the N71. Flood defences and tidal barrage – flood embankments in Caherdaniel West and Newtown and tidal barrage in the harbour with an inner area of approximately 78,880m². The barrage will need to be closed at the low tide preceding a tidal event in order to accommodate fluvial flows. The barrage would remain closed until the tide level outside is lower than the maximum water level within the barrage 9modelled as being approx. 9 hours).
Natura 2000 Site	
Brief description of the Natura 2000 site(s)	<p>Kenmare River SAC (002158)</p> <p>Kenmare River is a long and narrow south-west facing bay situated in the southwest of Ireland. The site includes very good quality examples of large shallow bays, reefs, and marine caves. Kenmare River is the only known site in Ireland for the Northern Sea-fan (<i>Swiftia pallida</i>) (which occurs near Sneem / Ardgroom). Qualifying features of the SAC are: [1160] Large Shallow Inlets and Bays, [1170] Reefs, [1220] Perennial Vegetation of Stony Banks, [1230] Vegetated Sea Cliffs, [1330] Atlantic Salt Meadows, [1410] Mediterranean Salt Meadows, [2120] Marram Dunes (White Dunes), [2130] Fixed Dunes (Grey Dunes)*, [4030] Dry Heath, [6130] Calaminarian Grassland, [8330] Sea Caves, [1014] Narrow-mouthed Whorl Snail (<i>Vertigo angustior</i>) (found in Derrynane), [1303] Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>), [1355] Otter (<i>Lutra lutra</i>) and [1365] Common (Harbour) Seal (<i>Phoca vitulina</i>).</p> <p> Beara Peninsula SPA (004155)</p> <p>The Beara Peninsula SPA is a coastal site situated on the west</p>

Screening Matrix	
	coast of Co. Cork, south-west of the town of Kenmare. It encompasses the high coast and sea cliff sections of the western end of the peninsula from Reenmore Point/Cod's Head in the north, around to the end of Dursey Island in the west, and to Bear Island in the south. The site is designated for Fulmar (<i>Fulmarus glacialis</i>) and Chough (<i>Pyrrhocorax pyrrhocorax</i>).
Assessment Criteria	
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	<p>In-stream works and removal of river bed and riparian habitat to accommodate flood management measures.</p> <p>Sediment release to the watercourse due to works within and in proximity to rivers and streams.</p> <p>Noise from construction machinery</p>
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of:	No likely impacts are determined for the Bantry, Kenmare or Castletownbere AFAs.
<p>Size and scale;</p> <p>Land-take;</p> <p>Distance from the Natura 2000 site or key features of the site;</p> <p>Resource requirements (water abstraction etc);</p> <p>Emissions (disposal to land, water or air);</p> <p>Excavation requirements;</p> <p>Transportation requirements;</p> <p>Duration of construction, operation, decommissioning etc;</p> <p>Other.</p>	
Describe any likely changes to the site arising as a result of:	No likely changes to the SAC / SPA are determined
<p>Reduction in habitat area;</p> <p>Disturbance to key species;</p> <p>Habitat or species fragmentation;</p> <p>Reduction in species density;</p> <p>Changes in key indicators of conservation value (water quality etc);</p> <p>Climate change.</p>	
Describe any likely impacts on the Natura 2000 site as a whole in terms of:	No likely impacts are determined.
<p>Interference with the key relationships that define the structure of the site;</p> <p>Interference with key relationships that define the function of the site.</p>	
Provide indicators of significance as a result of the identification of effects set out above in terms of:	No significant impacts are determined
<p>Loss;</p> <p>Fragmentation;</p>	

Screening Matrix	
<p>Disruption; Disturbance; Change to key elements of the site.</p>	
<p>Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.</p>	<p>No significant effects have been determined.</p>

7 References

DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities;

EC (2000) Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

Falvey J. P., Costello M. J. and Dempsey S. (1997) A survey of intertidal sediment biotopes in estuaries in Ireland. Unpublished report to the National Parks and Wildlife Service, Dublin, 258 pp.

Fossitt (2000) A Guide to Habitats in Ireland

Holman *et al* (2014). *IAQM Guidance on the assessment of dust from demolition and construction*, Institute of Air Quality Management, London. www.iaqm/wp-content/uploads/guidance/dust_assessment.pdf.

Institute of Estuarine & Coastal Studies, University of Hull (2009) Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Report to Humber INCA

King J. J. and Linnane S. M. (2004) The status and distribution of lamprey and shad in the Slaney and Munster Blackwater SACs. Irish Wildlife Manuals, No. 14. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Martin J. R., Perrin P.M., Delaney A. M., O'Neill F.H., McNutt K.E. (2008) Irish Semi-Natural Grasslands Survey. Annual Report No. 1: Counties Cork and Waterford

NPWS (2015) Conservation objectives for Beara Peninsula SPA [004155]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.

NPWS (2013a) Conservation Objectives: Kenmare River SAC 002158. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013b) The status of EU Protected habitats and Species in Ireland. Backing Documents, Article 17 forms, Maps. Volumes 1, 2 and 3.

NPWS (2012a) Marine Natura Impact Statements in Irish Special Areas of Conservation, A working Document.

NPWS (2012b) Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (Draft)

NRA, 1st June, 2009 Guidelines for Assessment of Ecological Impacts of National Roads Schemes.
Revision 2

Office of Public Works (April 2011) Arterial Drainage Maintenance Service Environmental Management
Protocols & Standard Operating Procedures

Office of Public Works (April 2014) National Screening of Freshwater Pearl Mussels as part of the CFRAM
programme (Unpublished Report)

Reid, N., Dingerkus, S.K., Stone, R.E., Pietravalle, S., Kelly, R., Buckley, J., Beebee, T.J.C. & Wilkinson,
J.W. (2013) National Frog Survey of Ireland 2010/11. Irish Wildlife Manuals, No. 58. National Parks and
Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Ruddock M. & Whitfield D.P. (2007) A Review of Disturbance Distances in Selected Bird Species. A report
from Natural Research (Projects) Ltd to Scottish Natural Heritage

Ryle T., Murray A., Connolly K., Swann M. (2009) Coastal Monitoring Project 2004-2006. Report to the
National Parks and Wildlife Service.

Schofield, H.W. (2008) The Lesser horseshoe bat conservation handbook. Report for the Vincent Wildlife
Trust.

Weilgart, L. (2013). A review of the impacts of seismic airgun surveys on marine life. Submitted to the CBD
Expert Workshop on Underwater Noise and its Impacts on Marine and Coastal Biodiversity, 25-27
February 2014, London, UK. Available at: <http://www.cbd.int/doc/?meeting=MCBEM-2014-01>

Appendix E. Climate Change Adaptability

Climate Change Adaptability

[illegible]

Climate Change Adaptability

AFA	Development & Assessment of Strategies, Plans & Measures				Design & Implementation (Actions Required to Adapt to Climate Change)	Score	Final (Highest) Score
Castletownbere	→	→	→	Option 1 Flood Defences	Adaptive approach: increase height of flood defences by 0.2m (Score 4)	2.00	2.00
					No physical provision: increase length of existing flood defence walls (Score 0)		
					or		
					or		
					or		0.00
					or		
					or		
					or		
					or		0.00
					or		
					or		
					or		
					or		0.00
					or		
					or		
					or		

Climate Change Adaptability

AFA	Development & Assessment of Strategies, Plans & Measures				Design & Implementation (Actions Required to Adapt to Climate Change)	Score	Final (Highest Score)		
Kenmare	→	→	→	Option 1 Flood Defences	Adaptive approach: increase height of flood defences <u>Note</u> , additional height may be accommodate by freeboard (Score 5)	2.50	→	2.50	
					No physical provision: increase length of existing flood embankments. Additional length of 46m required (Score 0)				
					or				
					or				
				Option 2 Storage	Adaptive approach: increase height of flood defences <u>Note</u> , additional height may be accommodate by freeboard (Score 5)	2.50	→	2.50	
					No physical provision: increase length of flood defences (Score 0)				
					or				
					Adaptive approach: increase the storage area to add additional volume (Score 3)				1.50
				No physical provision: increase length of flood defences (Score 0)					
				or					
				or					
				Option 3 Conveyance	Adaptive approach: increase height of flood defences <u>Note</u> , additional height may be accommodate by freeboard (Score 5)	2.50	→	2.50	
					No physical provision: increase length of flood defences (Score 0)				
					or				
					or				
				Option 4 Flow Diversion & Flood Defences	Adaptive approach: increase height of flood defences <u>Note</u> , additional height may be accommodate by freeboard (Score 5)	1.67	→	1.67	
					Adaptive approach: increase size of flow diversion culvert (Score 0)				
					No physical provision: increase length of flood defences (Score 0)				
					or				
				or					
or									
Option 4 Conveyance & Flow Diversion	Adaptive approach: increase height of flood defences <u>Note</u> , additional height may be accommodate by freeboard (Score 5)	1.67	→	1.67					
	Adaptive approach: increase size of flow diversion culvert (Score 0)								
	No physical provision: increase length of flood defences (Score 0)								
	or								
or									
or									

Appendix F. Multi Criteria Assessment

F.1 Local Weighting Data

AFA: Bantry

Objective	Local Weighting	Rationale	Code
Technical			
Ensure flood risk management options are operationally robust	5.00	Constant, as per Guidance Note 29	1a1
Reduce and where possible eliminate health and safety risks associated with the construction and operation of flood risk management options	5.00	Constant, as per Guidance Note 29	1b1
Ensure flood risk management options are adaptable to future flood risk	5.00	Constant, as per Guidance Note 29	1c1
Economy			
Minimise economic risk	5.00	3756526/75000	2a1
Minimise risk to transport infrastructure	5.00	Motorway 250() + National Primary 150() + (National Secondary 75() + Regional 25() + Local Rural 10() + Local Urban 17(.5+.02+.01+.001+.5+.02+.02+.02)	2b2
Minimise risk to utility infrastructure	0.00	Power Stations 500() + HV Sub-Stations 250() + Gas Assets - High Priority 100() + Gas Assets - Medium Priority 25() + Water Treatment Plants 250() + WwTP and Primary Pumping Facilities 250() + Core Telecommunications Exchanges 100() + Non-Core Telecommunications Exchanges 25()	2c3
Manage Risk to Agriculture	2.50	Based on agriculture at risk	2d1
Social			
Minimise risk to human health and life of residents	5.00	Nr. at risk from 50% AEP 2*.5(11) + Nr. at risk from 20% AEP 2*.2(3) + Nr. at risk from 10% AEP 2*.1(2) + Nr. at risk from 5% AEP 2*.05(1) + Nr. at risk from 2% AEP 2*.02() + Nr. at risk from 1% AEP 2*.01(12) + Nr. at risk from .5% AEP 2*.005(7) + Nr. at risk from .1% AEP 2*.001(13)	3a1
Minimise risk to high vulnerability properties	5.00	Nr. at risk from 50% AEP 50*0.5*(1) + Nr. at risk from 20% AEP 0.2*() + Nr. at risk from 10% AEP 0.1*() + Nr. at risk from 5% AEP 0.05*() + Nr. at risk from 2% AEP 0.02*() + Nr. at risk from 1% AEP 0.01*() + Nr. at risk from .5% AEP 0.005*() + Nr. at risk from .1% AEP 0.001()	3a2
Minimise risk to social infrastructure and amenity	5.00	Nr. at risk from 50% AEP 25*.5(2) + Nr. at risk from 20% AEP 25*.2(1) + Nr. at risk from 10% AEP 25*.1(1) + Nr. at risk from 5% AEP 25*.05(1) + Nr. at risk from 2% AEP 25*.02(1) + Nr. at risk from 1% AEP 25*.01(1) + Nr. at risk from .5% AEP 25*.005(0) + Nr. at risk from .1% AEP 25*.001(0)	3b1
Minimise risk to local employment	5.00	Nr. at risk from 50% AEP 5*.5(70) + Nr. at risk from 20% AEP 5*.2() + Nr. at risk from 10% AEP 5*.1(5) + Nr. at risk from 5% AEP 5*.05(4) + Nr. at risk from 2% AEP 5*.02(6) + Nr. at risk from 1% AEP 5*.01(34) + Nr. at risk from .5% AEP 5*.005(16) + Nr. at risk from .1% AEP 5*.001()	3b2
Environmental			
Provide no impediment to the achievement of water body objectives and, if possible, contribute to the achievement of water body objectives.	5.00	Constant, as per Guidance Note 28	4a1
Avoid detrimental effects to, and where possible enhance, Natura 2000 network, protected species and their key habitats, recognising relevant landscape features and stepping stones.	1.00	No Natura 2000 sites	4b1
Avoid damage to and where possible enhance the flora and fauna of the catchment	4.00	Kingfisher (Alcedo at this) has been recorded in Bantry during I-Webs surveys and may potentially be present on the Meelagh River. Bantry Bay supports large diversity of wetland birds including nationally important numbers of Little Grebe. Streams in Bantry are heavily culverted. Coastal wall in place at the harbour with low ecological value.	4c1
Maintain existing, and where possible create new, fisheries habitat including the maintenance or improvement of conditions that allow upstream migration for fish species.	5.00	no local information, but taking account of IFI consultation letter, the shellfish waters designation -	4d1
Protect, and where possible enhance, visual amenity, landscape protection zones and views into / from designated scenic areas within the river corridor.	4.00	Landscape character type classified as high value and highly sensitive at a county level	4'e1
Avoid damage to or loss of features, institutions and collections of architectural value and their setting and improve their protection from extreme floods.	3.00	The town is an architectural heritage area and there are a number of NIAHs throughout the town	4f1
Avoid damage to or loss of features, institutions and collections of archaeological value and their setting and improve their protection from extreme floods where this is beneficial.	3.00	there are a number of RMPS within zone of risk	4f2

AFA: Castletownbere

Objective	Local Weighting	Rationale	Code
Technical			
Ensure flood risk management options are operationally robust	5.00	Constant, as per Guidance Note 29	1a1
Reduce and where possible eliminate health and safety risks associated with the construction and operation of flood risk management options	5.00	Constant, as per Guidance Note 29	1b1
Ensure flood risk management options are adaptable to future flood risk	5.00	Constant, as per Guidance Note 29	1c1
Economy			
Minimise economic risk	2.26	169583/75000	2a1
Minimise risk to transport infrastructure	5.00	Motorway 250() + National Primary 150() + (National Secondary 75() + Regional 25(,5) + Local Rural 10() + Local Urban 25(,5+.02+.01)	2b2
Minimise risk to utility infrastructure	0.00	Power Stations 500() + HV Sub-Stations 250() + Gas Assets - High Priority 100() + Gas Assets - Medium Priority 25() + Water Treatment Plants 250() + WwTP and Primary Pumping Facilities 250() + Core Telecommunications Exchanges 100() + Non-Core Telecommunications Exchanges 25()	2c3
Manage Risk to Agriculture	0.00	Based on agriculture at risk	2d1
Social			
Minimise risk to human health and life of residents	0.37	Nr. at risk from 50% AEP 2*.5(1) + Nr. at risk from 20% AEP 2*.2() + Nr. at risk from 10% AEP 2*.1(1) + Nr. at risk from 5% AEP 2*.05() + Nr. at risk from 2% AEP 2*.02(2) + Nr. at risk from 1% AEP 2*.01(2) + Nr. at risk from .5% AEP 2*.005(4) + Nr. at risk from .1% AEP 2*.001(3)	3a1
Minimise risk to high vulnerability properties	0.00	Nr. at risk from 50% AEP 0.5() + Nr. at risk from 20% AEP 0.2() + Nr. at risk from 10% AEP 0.1() + Nr. at risk from 5% AEP 0.05() + Nr. at risk from 2% AEP 0.02() + Nr. at risk from 1% AEP 0.01() + Nr. at risk from .5% AEP 0.005() + Nr. at risk from .1% AEP 0.001()	3a2
Minimise risk to social infrastructure and amenity	1.40	Nr. at risk from 50% AEP 25*.5() + Nr. at risk from 20% AEP 25*.2(1) + Nr. at risk from 10% AEP 25*.1() + Nr. at risk from 5% AEP 25*.05(1) + Nr. at risk from 2% AEP 25*.02() + Nr. at risk from 1% AEP 25*.01() + Nr. at risk from .5% AEP 25*.005(1) + Nr. at risk from .1% AEP 25*.001(1)	3b1
Minimise risk to local employment	5.00	Nr. at risk from 50% AEP 5*.5(1) + Nr. at risk from 20% AEP 5*.2(1) + Nr. at risk from 10% AEP 5*.1(2) + Nr. at risk from 5% AEP 5*.05(3) + Nr. at risk from 2% AEP 5*.02(1) + Nr. at risk from 1% AEP 5*.01(5) + Nr. at risk from .5% AEP 5*.005(6) + Nr. at risk from .1% AEP 5*.001(12)	3b2
Environmental			
Provide no impediment to the achievement of water body objectives and, if possible, contribute to the achievement of water body objectives.	5.00	The provision of flood walls and embankments will not have an impact on the attainment of good water status in the long term, however there is potential for a potential for a short term impact during the construction phase due to the release of sediment and materials to the waterbody during the construction phase. (-2)	4a1
Avoid detrimental effects to, and where possible enhance, Natura 2000 network, protected species and their key habitats, recognising relevant landscape features and stepping stones.	2.00	No Impact on the Beara peninsula SPA during the construction phase or in the permeant scenario due to fact that the is located approximately 3.5km from Castletownbere.	4b1
Avoid damage to and where possible enhance the flora and fauna of the catchment	2.00	No potential for significant impact on flora and fauna as the proposed walls and embankments will be constructed within existing hardstanded areas in Castletownbere.	4c1
Maintain existing, and where possible create new, fisheries habitat including the maintenance or improvement of conditions that allow upstream migration for fish species.	2.00	No potential for significant impact on fisheries as the proposed walls and embankments will be constructed within existing hardstanded areas in Castletownbere.	4d1
Protect, and where possible enhance, visual amenity, landscape protection zones and views into / from designated scenic areas within the river corridor.	4.00	The area in which Castletownbere is located is classified as a "High Value Landscape" by Cork County Council. There are also a number of scenic routes through the town (R571 & R572). The proposed measures consist of low flood walls, with the highest walls located at the rear of properties. Proposed flood walls located in the harbour area are low in height (1.1m) and are not out of character without the harbour setting. It is considered that there is potential for some short term impact on the landscape and visual amenity of the area prior to the re-establishment of vegetation (-1).	4'e1
Avoid damage to or loss of features, institutions and collections of architectural value and their setting and improve their protection from extreme floods.	3.00	Protection of a number of NIAHs that would otherwise be subject to flooding (3)	4f1
Avoid damage to or loss of features, institutions and collections of archaeological value and their setting and improve their protection from extreme floods where this is beneficial.	1.00	There are no known archaeological sites impacted by the proposed flood mitigation measures.	4f2

AFA: Kenmare

Objective	Local Weighting	Rationale	Code
Technical			
Ensure flood risk management options are operationally robust	5.00	Constant, as per Guidance Note 29	1a1
Reduce and where possible eliminate health and safety risks associated with the construction and operation of flood risk management options	5.00	Constant, as per Guidance Note 29	1b1
Ensure flood risk management options are adaptable to future flood risk	5.00	Constant, as per Guidance Note 29	1c1
Economy			
Minimise economic risk	5.00	665454/75000	2a1
Minimise risk to transport infrastructure	5.00	Motorway 250() + National Primary 150() + (National Secondary 75(.05) + Regional 25() + Local Rural 10(.02) + Local Urban 20(.05+.1+.05+.05)	2b2
Minimise risk to utility infrastructure	0.00	Power Stations 500() + HV Sub-Stations 250() + Gas Assets - High Priority 100() + Gas Assets - Medium Priority 25() + Water Treatment Plants 250() + WwTP and Primary Pumping Facilities 250() + Core Telecommunications Exchanges 100() + Non-Core Telecommunications Exchanges 25()	2c3
Manage Risk to Agriculture	5.00	Based on agriculture at risk	2d1
Social			
Minimise risk to human health and life of residents	5.00	Nr. at risk from 50% AEP 2*.5(4) + Nr. at risk from 20% AEP 2*.2(5) + Nr. at risk from 10% AEP 2*.1(1) + Nr. at risk from 5% AEP 2*.05(13) + Nr. at risk from 2% AEP 2*.02(68) + Nr. at risk from 1% AEP 2*.01(52) + Nr. at risk from .5% AEP 2*.005(15) + Nr. at risk from .1% AEP 2*.001(10)	3a1
Minimise risk to high vulnerability properties	0.00	Nr. at risk from 50% AEP 0.5*() + Nr. at risk from 20% AEP 0.2*() + Nr. at risk from 10% AEP 0.1*() + Nr. at risk from 5% AEP 0.05*() + Nr. at risk from 2% AEP 0.02*() + Nr. at risk from 1% AEP 0.01*() + Nr. at risk from .5% AEP 0.005*() + Nr. at risk from .1% AEP 0.001()	3a2
Minimise risk to social infrastructure and amenity	0.28	Nr. at risk from 50% AEP 25*.5() + Nr. at risk from 20% AEP 25*.2() + Nr. at risk from 10% AEP 25*.1() + Nr. at risk from 5% AEP 25*.05() + Nr. at risk from 2% AEP 25*.02() + Nr. at risk from 1% AEP 25*.01(1) + Nr. at risk from .5% AEP 25*.005() + Nr. at risk from .1% AEP 25*.001(1)	3b1
Minimise risk to local employment	5.00	Nr. at risk from 50% AEP 5*.5(1) + Nr. at risk from 20% AEP 5*.2() + Nr. at risk from 10% AEP 5*.1() + Nr. at risk from 5% AEP 5*.05(2) + Nr. at risk from 2% AEP 5*.02(34) + Nr. at risk from 1% AEP 5*.01(44) + Nr. at risk from .5% AEP 5*.005(19) + Nr. at risk from .1% AEP 5*.001(37)	3b2
Environmental			
Provide no impediment to the achievement of water body objectives and, if possible, contribute to the achievement of water body objectives.	5.00	Constant, as per Guidance Note 28	4a1
Avoid detrimental effects to, and where possible enhance, Natura 2000 network, protected species and their key habitats, recognising relevant landscape features and stepping stones.	5.00	Kenmare River SAC, Old Domestic Building, Dromore Wood SAC and Mucksna Wood SAC nearby, Lesser horse shoe bat roosts within 2km of town centre (LHB typically forage within 2km of their roost but up to 6km).	4b1
Avoid damage to and where possible enhance the flora and fauna of the catchment	5.00	Margaritifera in the Finnihy River. Kingfisher and otter have been recorded on the Finnihy. A number of nearby pNHAs incl Roughly river Estuary. Kenmare Sound mudflats are important habitat as are saltmarsh habitats along the coast.	4c1
Maintain existing, and where possible create new, fisheries habitat including the maintenance or improvement of conditions that allow upstream migration for fish species.	2.00	Current water status remains good indicating that ongoing flooding is not having an impact on water quality of the value of fishery habitats. Potential low value fisheries amenity	4d1
Protect, and where possible enhance, visual amenity, landscape protection zones and views into / from designated scenic areas within the river corridor.	2.00	There are no landscape designations associated with the town. There are no scenic views or prospects designated along the approach roads. The town is located within the Kenmare Valley LCA. This LCA is considered to be of low sensitive	4'e1
Avoid damage to or loss of features, institutions and collections of architectural value and their setting and improve their protection from extreme floods.	3.00	Kenmare is designated as an architectural conservation zone	4f1
Avoid damage to or loss of features, institutions and collections of archaeological value and their setting and improve their protection from extreme floods where this is beneficial.	3.00	There are a number of recorded RMP within the town at risk from flooding	4f2

F.2 MCA Matrices

Flood Risk Management Options	Castletownbere
--------------------------------------	----------------

Multi-Criteria Assessment									Do Nothing		
Criteria	Objective	Sub-Objective	Code	Indicator	Basic Requirement	Aspirational Target	Global Weighting	Local Weighting	Score	Rationale	Wtd Score
Technical	Ensure flood risk management options are operationally robust	Ensure flood risk management options are operationally robust	1a1	Level of operational risk of option- Degree of reliance on mechanical, electrical or electronic systems, or on human intervention, action or decision, for the option to operate or perform successfully, - Non-numeric			20.00	5.00	0.00	Do nothing option	0.00
	Minimise health and safety risk of flood risk management options	Reduce and where possible eliminate health and safety risks associated with the construction and operation of flood risk management options	1b1	Degree of health and safety risk during construction and operation	Moderate to high, but acceptable and manageable, level of health and safety risk during construction, maintenance or operation	Negligible risk to health and safety during construction, maintenance or operation	20.00	5.00	0.00	Do nothing option	0.00
	Ensure flood risk management options are adaptable to future flood risk, and the potential impacts of climate change	Ensure flood risk management options are adaptable to future flood risk	1c1	Sustainability and adaptability of the flood risk management measure in the face of potential future changes, including the potential impacts of climate change	Option should not hinder future interventions that may be required to manage potential future increases in risk	Option to provide for, or be adaptable to, the HEFS in terms of maintaining the standard of protection at no or negligible cost	20.00	5.00	0.00	Do nothing option	0.00
Technical Score								0.00			
Economic	Minimise economic risk	Minimise economic risk	2a1	Annual Average Damage (AAD) expressed in Euro / year	AAD is not increased	100% reduction in AAD	24.00	2.26	0.00	Do nothing option	0.00
	Minimise risk to transport infrastructure	Minimise risk to transport infrastructure	2b1	Length of infrastructure at risk from flooding in the 0.1% AEP event	Do not increase length of infrastructure at risk from flooding	Reduce the length of infrastructure at risk from flooding by 50%	10.00	5.00	0.00	Do nothing option	0.00
	Minimise risk to utility infrastructure	Minimise risk to utility infrastructure	2c1	Utilities at risk from flooding	No increase number of utility receptors at risk from flooding	Reduce number of utility receptors at risk to 0	14.00	0.00	0.00	Do nothing option	0.00
	Manage Risk to Agriculture	Manage Risk to Agriculture	2d1	Agricultural production	Do not increase in negative impact of flooding on agricultural production	Provide the potential for enhanced agricultural production	12.00	0.00	0.00	Do nothing option	0.00
Economic Score								0.00			
Social	Minimise risk to human health and life	Minimise risk to human health and life of residents	3a1	Annual Average number of residential properties at risk from flooding	Number of residential properties at risk from flooding does not increase	Reduce the number of residential properties at risk from flooding to 0	27.00	0.37	0.00	Do nothing option	0.00
		Minimise risk to high vulnerability properties	3a2	Number of high vulnerability properties at risk from flooding	Do not increase number of high vulnerability properties at risk from flooding	Reduce the number of high vulnerability properties at risk from flooding to 0	17.00	0.00	0.00	Do nothing option	0.00
	Minimise risk to community	Minimise risk to social infrastructure and amenity	3b1	Number of social infrastructure receptors at risk from flooding	Do not increase number of social infrastructure receptors at risk from flooding	Reduce the number of social infrastructure receptors at risk from flooding to 0	9.00	1.40	0.00	Do nothing option	0.00
		Minimise risk to local employment	3b2	Number of enterprises at risk from flooding	Do not increase number of enterprises at risk from flooding	Reduce the number of enterprises at risk from flooding to 0	7.00	5.00	0.00	Do nothing option	0.00
Social Score								0.00			
Environmental	Support the objectives of the WFD	Provide no impediment to the achievement of water body objectives and, if possible, contribute to the achievement of water body objectives	4a1	Ecological status of water bodies	Provide no constraint to the achievement of water body objectives	Contribute to the achievement of water body objectives	16.00	5.00	0.00	The coastal waterbody in the vicinity of Castletownbere is classified as being of "good water status". This indicates that the occurrence of flooding at Castletownbere (do nothing scenario) is not precluding the waterbody from attaining good water status.	0.00
	Support the objectives of the Habitats and Birds Directives	Avoid detrimental effects to, and where possible enhance, Natura 2000 network, protected species and their key habitats, recognising relevant landscape features and stepping stones.	4b1	Area of site at risk from flooding and qualitative Assessment of impact of option on habitat	No deterioration in the conservation status of designated sites as a result of flood risk management measures	Improvement in the conservation status of designated sites as a result of flood risk management measures	10.00	2.00	0.00	No Impact on the Beara peninsula SPA which is located approximately 3.5km from Castletownbere.	0.00
	Avoid damage to, and where possible enhance, the flora and fauna of the catchment	Avoid damage to and where possible enhance the flora and fauna of the catchment	4c1	Avoid damage to and where possible enhance, legally protected sites / habitats and other sites / habitats of national regional and local nature conservation importance	No deterioration on condition of existing sites due to implementation of option	Creation of new or improved condition of existing sites due to implementation of option	5.00	2.00	0.00	No Impact	0.00
	Protect, and where possible enhance, fisheries resource within the catchment	Maintain existing, and where possible create new, fisheries habitat including the maintenance or improvement of conditions that allow upstream migration for fish species.	4d1	Area of suitable habitat supporting fish. Number of upstream barriers	No loss of integrity of fisheries habitat. Maintenance of upstream accessibility	No loss of fishery habitat. Improvement of habitat quality / quantity. Enhanced upstream accessibility	13.00	2.00	0.00	No Impact	0.00
	Protect, and where possible enhance, landscape character and visual amenity within the river corridor	Protect, and where possible enhance, visual amenity, landscape protection zones and views into / from designated scenic areas within the river corridor.	4'e1	Changes to reported conservation status of designated sites relating to flood risk management Extent of affected Natura 2000 site, NHA/pNHA or other affected National or International designations (e.g. Nature reserves and Ramsar sites), i.e. Area of re	1. No significant impact on landscape designation (protected site, scenic route/amenity, natural landscape form) within zone of visibility of measures 2. No significant change in the quality of existing landscape characteristics of the receiving environment	1. No change to the existing landscape form. 2. Enhancement of existing landscape or landscape feature	8.00	4.00	0.00	No Impact	0.00
	Avoid damage to or loss of features, institutions and collections of cultural heritage importance and their setting	Avoid damage to or loss of features, institutions and collections of architectural value and their setting and improve their protection from extreme floods.	4i1	a) The number of architectural features, institutions and collections subject to flooding. b) The impact of flood risk management measures on architectural features, institutions and collections.	a) No increase in risk to architectural features, institutions and collections at risk from flooding. b) No detrimental impacts from flood risk management measures on architectural features, institutions and collections.	a) Complete removal of all relevant architectural features, institutions and collections from the risk of harm by extreme floods. b) Enhanced protection and value of architectural features, institutions and collections importance arising from the implementation of the selected measures.	4.00	3.00	-3.00	Flooding is currently impacting on 7 NIAHs within the town of Castletownbere.	-36.00
		Avoid damage to or loss of features, institutions and collections of archaeological value and their setting and improve their protection from extreme floods where this is beneficial.	4i2	a) The number of archaeological features, institutions and collections subject to flooding. b) The impact of flood risk management measures on archaeological features, institutions and collections.	a) No increase in risk to archaeological features, institutions and collections at risk from flooding. b) No detrimental impacts from flood risk management measures on archaeological features, institutions and collections.	a) Complete removal of all relevant archaeological features, institutions and collections from the risk of harm by extreme floods. b) Enhanced protection and value of archaeological features, institutions and collections importance arising from the implementation of the selected measures.	4.00	1.00	0.00	There are no known archaeological sites impacted by flooding	0.00
Environmental Score											-36.00
MCA Benefit Score											-36.00
Option Selection MCA Score											-36.00
MCA benefit Cost Ratio											0.00000
Economic Benefit Cost Ratio											0.00000

Flood Risk Management Options	Castletownbere
--------------------------------------	----------------

Multi-Criteria Assessment									Option 1 - Flood Defences			
Criteria	Objective	Sub-Objective	Code	Indicator	Basic Requirement	Aspirational Target	Global Weighting	Local Weighting	Score	Rationale	Wtd score	
Technical	Ensure flood risk management options are operationally robust	Ensure flood risk management options are operationally robust	1a1	Level of operational risk of option- Degree of reliance on mechanical, electrical or electronic systems, or on human intervention, action or decision, for the option to operate or perform successfully, - Non-numeric			20.00	5.00	2.00	Flood walls and demountable barriers	200.00	
	Minimise health and safety risk of flood risk management options	Reduce and where possible eliminate health and safety risks associated with the construction and operation of flood risk management options	1b1	Degree of health and safety risk during construction and operation	Moderate to high, but acceptable and manageable, level of health and safety risk during construction, maintenance or operation	Negligible risk to health and safety during construction, maintenance or operation	20.00	5.00	2.00	Risk of drowning, electrocution and falling from a height	200.00	
	Ensure flood risk management options are adaptable to future flood risk, and the potential impacts of climate change	Ensure flood risk management options are adaptable to future flood risk	1c1	Sustainability and adaptability of the flood risk management measure in the face of potential future changes, including the potential impacts of climate change	Option should not hinder future interventions that may be required to manage potential future increases in risk	Option to provide for, or be adaptable to, the HEFS in terms of maintaining the standard of protection at no or negligible cost	20.00	5.00	2.00	Some walls can be adapted but new walls will also be required in HEFS	200.00	
Technical Score									0.00			600.00
Economic	Minimise economic risk	Minimise economic risk	2a1	Annual Average Damage (AAD) expressed in Euro / year	AAD is not increased	100% reduction in AAD	24.00	2.26	4.55	As calculated	246.89	
	Minimise risk to transport infrastructure	Minimise risk to transport infrastructure	2b1	Length of infrastructure at risk from flooding in the 0.1% AEP event	Do not increase length of infrastructure at risk from flooding	Reduce the length of infrastructure at risk from flooding by 50%	10.00	5.00	4.50	As calculated	225.00	
	Minimise risk to utility infrastructure	Minimise risk to utility infrastructure	2c1	Utilities at risk from flooding	No increase number of utility receptors at risk from flooding	Reduce number of utility receptors at risk to 0	14.00	0.00	0.00	As calculated	0.00	
	Manage Risk to Agriculture	Manage Risk to Agriculture	2d1	Agricultural production	Do not increase in negative impact of flooding on agricultural production	Provide the potential for enhanced agricultural production	12.00	0.00	0.00	As calculated	0.00	
Economic Score									0.00			471.89
Social	Minimise risk to human health and life	Minimise risk to human health and life of residents	3a1	Annual Average number of residential properties at risk from flooding	Number of residential properties at risk from flooding does not increase	Reduce the number of residential properties at risk from flooding to 0	27.00	0.37	3.55	As calculated	35.10	
		Minimise risk to high vulnerability properties	3a2	Number of high vulnerability properties at risk from flooding	Do not increase number of high vulnerability properties at risk from flooding	Reduce the number of high vulnerability properties at risk from flooding to 0	17.00	0.00	0.00	As calculated	0.00	
	Minimise risk to community	Minimise risk to social infrastructure and amenity	3b1	Number of social infrastructure receptors at risk from flooding	Do not increase number of social infrastructure receptors at risk from flooding	Reduce the number of social infrastructure receptors at risk from flooding to 0	9.00	1.40	3.57	As calculated	45.00	
		Minimise risk to local employment	3b2	Number of enterprises at risk from flooding	Do not increase number of enterprises at risk from flooding	Reduce the number of enterprises at risk from flooding to 0	7.00	5.00	4.47	As calculated	156.28	
Social Score									0.00			236.38
Environmental	Support the objectives of the WFD	Provide no impediment to the achievement of water body objectives and, if possible, contribute to the achievement of water body objectives	4a1	Ecological status of water bodies	Provide no constraint to the achievement of water body objectives	Contribute to the achievement of water body objectives	16.00	5.00	-2.00	The provision of flood walls and embankments will not have an impact on the attainment of good water status in the long term, however there is potential for a potential for a short term impact during the construction phase due to the release of sediment and materials to the waterbody during the construction phase. (-2)	-160.00	
	Support the objectives of the Habitats and Birds Directives	Avoid detrimental effects to, and where possible enhance, Natura 2000 network, protected species and their key habitats, recognising relevant landscape features and stepping stones.	4b1	Area of site at risk from flooding and qualitative Assessment of impact of option on habitat	No deterioration in the conservation status of designated sites as a result of flood risk management measures	Improvement in the conservation status of designated sites as a result of flood risk management measures	10.00	2.00	0.00	No impact on the Beara peninsula SPA during the construction phase or in the permeant scenario due to fact that the is located approximately 3.5km from Castletownbere.	0.00	
	Avoid damage to, and where possible enhance, the flora and fauna of the catchment	Avoid damage to and where possible enhance the flora and fauna of the catchment	4c1	Avoid damage to and where possible enhance, legally protected sites / habitats and other sites / habitats of national regional and local nature conservation importance	No deterioration on condition of existing sites due to implementation of option	Creation of new or improved condition of existing sites due to implementation of option	5.00	2.00	0.00	No potential for significant impact on flora and fauna as the proposed walls and embankments will be constructed within existing hardstand areas in Castletownbere.	0.00	
	Protect, and where possible enhance, fisheries resource within the catchment	Maintain existing, and where possible create new, fisheries habitat including the maintenance or improvement of conditions that allow upstream migration for fish species.	4d1	Area of suitable habitat supporting fish. Number of upstream barriers	No loss of integrity of fisheries habitat. Maintenance of upstream accessibility	No loss of fishery habitat. Improvement of habitat quality / quantity. Enhanced upstream accessibility	13.00	2.00	0.00	No potential for significant impact on fisheries as the proposed walls and embankments will be constructed within existing hardstand areas in Castletownbere.	0.00	
	Protect, and where possible enhance, landscape character and visual amenity within the river corridor	Protect, and where possible enhance, visual amenity, landscape protection zones and views into / from designated scenic areas within the river corridor.	4'e1	Changes to reported conservation status of designated sites relating to flood risk management Extent of affected Natura 2000 site, NHA/pNHA or other affected National or International designations (e.g. Nature reserves and Ramsar sites), i.e. Area of re	1. No significant impact on landscape designation (protected site, scenic route/amenity, natural landscape form) within zone of visibility of measures 2. No significant change in the quality of existing landscape characteristics of the receiving environment	1. No change to the existing landscape form. 2. Enhancement of existing landscape or landscape feature	8.00	4.00	-1.00	The area in which Castletownbere is located is classified as a "High Value Landscape" by Cork County Council. There are also a number of scenic routes through the town (R571 & R572). The proposed measures consist of low flood walls, with the highest walls located at the rear of properties. Proposed flood walls located in the harbour area are low in height (1.1m) and are not out of character without the harbour setting. It is considered that there is potential for some short term impact on the landscape and visual amenity of the area prior to the re-establishment of vegetation (-1).	-32.00	
	Avoid damage to or loss of features, institutions and collections of cultural heritage importance and their setting	Avoid damage to or loss of features, institutions and collections of architectural value and their setting and improve their protection from extreme floods.	4i1	a) The number of architectural features, institutions and collections subject to flooding. b) The impact of flood risk management measures on architectural features, institutions and collections.	a) No increase in risk to architectural features, institutions and collections at risk from flooding. b) No detrimental impacts from flood risk management measures on architectural features, institutions and collections.	a) Complete removal of all relevant architectural features, institutions and collections from the risk of harm by extreme floods. b) Enhanced protection and value of architectural features, institutions and collections importance arising from the implementation of the selected measures.	4.00	3.00	3.00	Protection of a number of NIAHs that would otherwise be subject to flooding (3)	36.00	
		Avoid damage to or loss of features, institutions and collections of archaeological value and their setting and improve their protection from extreme floods where this is beneficial.	4i2	a) The number of archaeological features, institutions and collections subject to flooding. b) The impact of flood risk management measures on archaeological features, institutions and collections.	a) No increase in risk to archaeological features, institutions and collections at risk from flooding. b) No detrimental impacts from flood risk management measures on archaeological features, institutions and collections.	a) Complete removal of all relevant archaeological features, institutions and collections from the risk of harm by extreme floods. b) Enhanced protection and value of archaeological features, institutions and collections importance arising from the implementation of the selected measures.	4.00	1.00	1.00	There are no known archaeological sites impacted by the proposed flood mitigation measures.	4.00	
Environmental Score												-152.00
MCA Benefit Score												556.26
Option Selection MCA Score												1156.26
MCA benefit Cost Ratio												0.00022
Economic Benefit Cost Ratio												1.15

