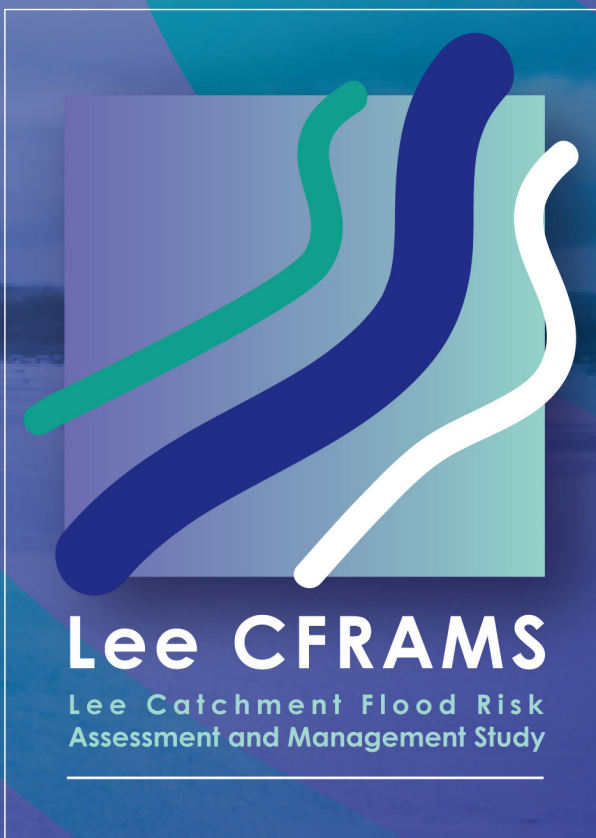




## SEA Statement

May 2013

### Contents amendment record

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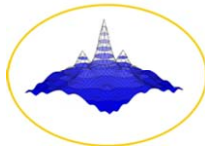
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*MarCon Computations International  
Ltd*



BRADY SHIPMAN MARTIN

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## 1. Introduction

### 1.1. Introduction

Halcrow has been commissioned by The Office of Public Works (OPW) in Ireland to prepare a Catchment Flood Risk Management Plan (CFRMP) for the River Lee catchment in County Cork. Situated in the catchment are several *Natura 2000* sites designated under the EU Birds Directive<sup>1</sup> and Habitats Directive<sup>2</sup>: Mullaghanish Bog Special Area of Conservation (SAC), Mullaghanish to Musheramere Mountains Special Protection Area (SPA), St. Gobnet's Wood SAC, The Gearagh SAC and SPA, Cork Harbour SPA and Great Island Channel SAC.

Under Article 6(3) of the EU Habitats Directive, an "appropriate assessment" is required where any plan or project, either alone or 'in combination' with other plans or projects, could have an adverse effect on the integrity of a *Natura 2000* or European site. This requirement is implemented in Ireland through Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)<sup>3</sup>.

This report documents the assessment process to determine whether the proposed Lee CFRMP could have a significant effect on the integrity of the Mullaghanish Bog, Mullaghanish to Musheramere Mountains, St. Gobnet's Wood, The Gearagh, Cork Harbour and/or Great Island Channel *Natura 2000* sites. It updates the Habitats Directive Assessment published in February 2010, within the Strategic Environmental Assessment (SEA) Environmental Report and the CFRMP, to take account of subsequent changes in legislation and policy in Ireland and modifications to the listed special conservation interests and the conservation objectives of the European sites (as published on the NPWS website, 25/03/2013, unless otherwise stated).

### 1.2. Habitats Directive requirements

Article 6(3) of the EU Habitats Directive requires that:

*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*

---

<sup>1</sup> Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive') (the codified version of Council Directive 79/409/EEC as amended).

<sup>2</sup> Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (the 'Habitats Directive')

<sup>3</sup> Which supercedes the European Union (Natural Habitats) Regulations, SI 94/1997, as amended and Department of Environment, Heritage and Local Government Circular Letter SEA 1/08 & NPWS 1/08. Appropriate Assessment of Land Use Plans. 15 February, 2008



*not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

Consequently, Regulation 42 (1) of the European Communities (Birds and Natural Habitats) Regulations 2011 requires that, in Ireland:

*A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.*

Therefore, it must first be established, through an initial screening assessment, whether: (1) the proposed Plan is directly connected with or necessary for the management of a European site for nature conservation; and (2) it is likely to have a significant adverse effect on a European site, either individually or in combination with other Plans or projects. In undertaking this initial screening assessment, consultation should be undertaken with the National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government (DEHLG) (through the Development Applications Unit (DAU)).

Following screening, Regulation 42 (6) requires that:

*The public authority shall determine that an Appropriate Assessment of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site.*

In compliance with Article 6(3) of the EU Habitats Directive, this appropriate assessment must then determine whether or not the plan will adversely affect the integrity<sup>4</sup> of the European site. As part of this process, the advice of NPWS needs to be sought and considered. Should the appropriate assessment identify that a proposed Plan would have an adverse effect on the integrity of a European site, European Communities (Birds and Natural Habitats) Regulations 2011, Regulation 43 requires that further conditions must be satisfied before a Plan could be finalised.

### **1.3. Approach to and scope of this assessment**

Following the identification of the need for an assessment of the proposed Lee CFRMP under the requirements of the Habitats Directive, in line with the requirements of European Communities (Birds and Natural Habitats) Regulations 2011 and the 2009 DEHLG Guidance

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<sup>4</sup> The integrity of a site is the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.

for Planning Authorities<sup>5</sup>, and with reference to recent practice in Ireland<sup>6</sup>, it was established that the assessment would be undertaken in two phases: Stage 1 – Appropriate Assessment Screening and, if required, a subsequent, more detailed, Stage 2 – Appropriate Assessment (AA).

This report or Natura Impact Statement is the output from both the initial screening phase and the appropriate assessment phase. The screening assessment was undertaken in 2009 and was based on an examination of *Natura 2000* Site Synopses and Standard Data Forms, draft site Conservation Objectives and other documents provided by the NPWS, as well as readily accessible internet resources concerning the nature and wildlife value of the sites. It determined whether the proposed Lee CFRMP is likely to have a significant effect on the European site features and thus determined the need to proceed to the Stage 2 Appropriate Assessment. The appropriate assessment then involved a more detailed analysis of the potential situations for a significant effect, in order to determine whether the integrity of the European sites would be adversely affected by the CFRMP. This incorporated updated information on the listed special conservation interests and conservation objectives of the European sites, as well as other documents obtained from the NPWS website<sup>7</sup>,

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<sup>5</sup> DEHLG (2009/10) *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities*. 84pp.

<sup>6</sup> For example: Cork County Council (2009) *Habitats Directive Article 6 Assessment: River Basin Management Plans and Programmes of Measures - South Western RBD*; CAAS/Wicklow County Council (2008) *Appropriate Assessment Screening of the Wicklow Environs and Rathnew Local Area Plan 2008-2014*.

<sup>7</sup> <http://www.npws.ie/protectedsites/>



## 2. The Catchment Flood Risk Management Plan

### 2.1. Introduction

The River Lee rises in the Shehy mountains in the south west of Ireland and flows to Cork Harbour to the east. The river and its main tributaries, the rivers Sullane, Laney, Dripsey, Bride and Shournagh drain an area of more than 1,100km<sup>2</sup> upstream of Cork city. The river is partly controlled by the Carrigadrohid and Inniscarra hydroelectric dams owned by the Electricity Supply Board. The catchment also includes a number of smaller rivers and their estuaries that drain into Cork Harbour. These include the Glashaboy, Owennacurra and Owenboy Rivers.

Significant flooding occurs throughout the Lee catchment from time to time, affecting a number of towns and villages. Low lying areas of Cork City centre are affected by both fluvial and tidal flooding, for example, during the tidal flood event of October 2004 and more recently during the fluvial event of November 2009. Much of the flooding occurs during adverse weather conditions when heavy rainfall causes high river flows, and low pressure causes surges in Cork Harbour. High tides also impact on the level of flooding. Flood risk can also be increased by local conditions, for example: where bridges restrict high flows; where the build up of debris causes blockages; and as a result of environmental and land use changes.

Flood risk is likely to increase in the future with predicted changes in climate and sea level rise, ongoing development and other pressures that may arise. To address this, a catchment-based flood risk assessment and management study of the River Lee and its tributaries and estuary – the Lee catchment – has been undertaken by the Office of Public Works and its partners, Cork City Council and Cork County Council. The study covers Cork Harbour, the main watercourses and their estuaries, urban areas known to be at risk from flooding and areas subject to significant development pressure, both now and in the future, as shown on Figure 2-1.

This study is the primary pilot project for the OPW's Catchment Flood Risk Assessment and Management (CFRAM) Programme, and the associated development of CFRMPs, within Ireland.

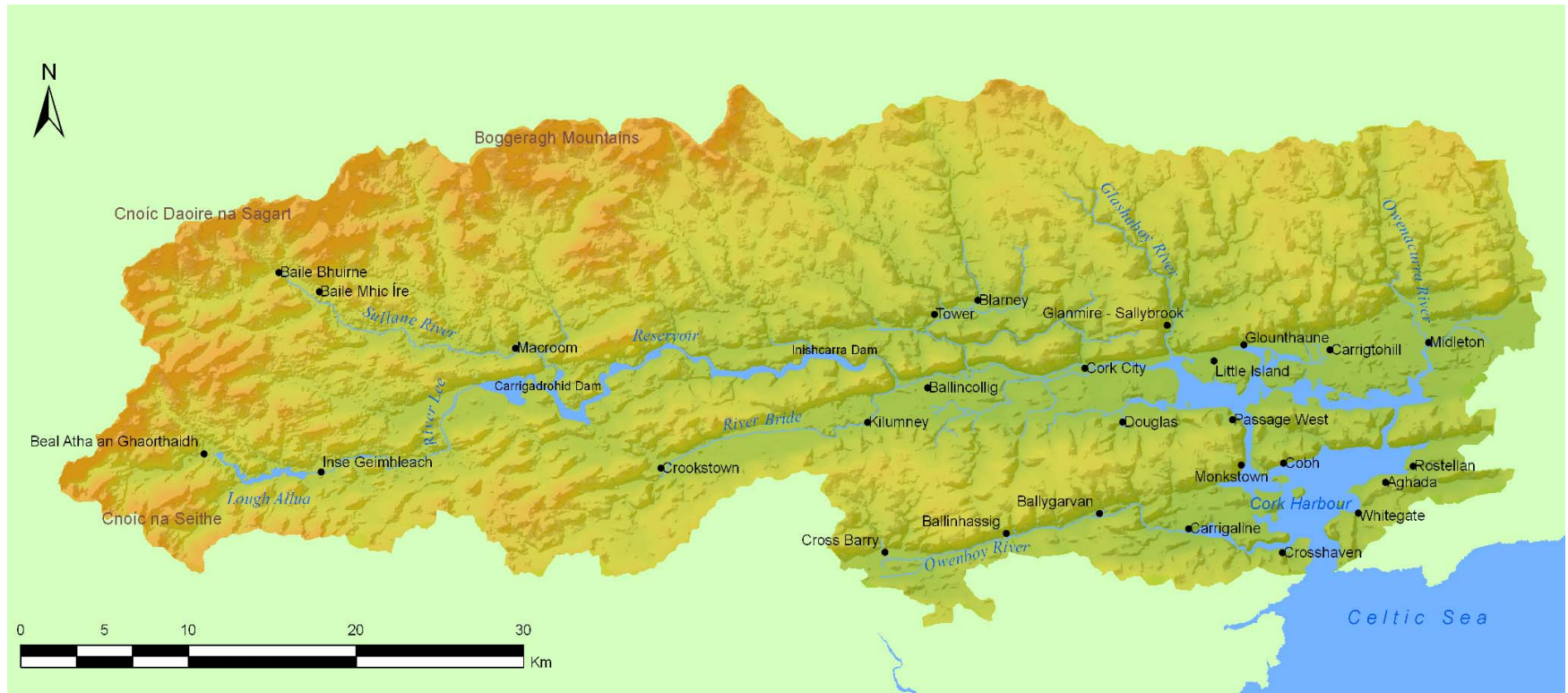


Figure 2-1: Lee catchment area

## 2.2. Proposed CFRMP actions and works

To simplify the process for option development in the Lee catchment, the catchment was divided into a number of assessment units, which are defined at four spatial scales:

- (i) **Catchment scale:** in this case the Lee catchment study area (~2,000km<sup>2</sup>);
- (ii) **Analysis unit (AU) scale:** these are large sub-catchments (e.g. Upper Lee or Owenboy) or areas of tidal influence (e.g. Cork Harbour). For fluvial AUs that have a tidal influence at their downstream end, there is overlap between this area of tidal influence and the Cork Harbour AU;
- (iii) **Areas of Potential Significant Risk (APSR):** for the option development process these are existing urban areas with high degrees of flood risk and hence economic damage;
- (iv) **Individual risk receptor (IRR):** an individual asset of particular economic or social value that has been identified as being prone to flooding and hence represents a significant risk in its own right, such as transport and utilities infrastructure, which may require specific consideration during the development of the flood risk management options.

The AUs and APSRs identified for the option assessment process are listed in Table 2-1 and shown on Figure 2-2.

*Table 2-1: AUs and APSRs for the Lee catchment (fluvial AUs that overlap with the Harbour/Tidal AU are shown in **bold**)*

| Catchment scale                                                                                                                                                                                                                                                                                                                                                                                                        | Analysis Unit         | APSRs                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Lee Catchment                                                                                                                                                                                                                                                                                                                                                                                                          | Upper Lee*            | Baile Bhúirne/Baile Mhic Íre, Macroom                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Owenboy*</b>       | Cross Barry; Carrigaline                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Glashaboy</b>      | Sallybrook/Glanmire                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Owennacurra</b>    | Midleton                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Carrigtohill**</b> | No urban areas at economic risk                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Lower Lee</b>      | Cork City; Ballincollig; Blarney/Tower; Crookstown; Kilmoney                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Tramore</b>        | Douglas/Togher                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                        | Kiln                  | No urban areas at economic risk                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                        | Harbour/Tidal area*   | Crosshaven; Monkstown/Passage West; Cobh; Little Island; Glounthaune; Rostellan/Aghada; Cork City; Carrigaline; Midleton; Sallybrook/Glanmire |
| <p>*Some urban areas, including Inse Geimhleach, Beal Atha an Gaorthaidh, Ballygarvan, Ballinhassig and Whitegate, were assessed as part of their respective AU rather than as individual APSRs</p> <p>**More detailed assessment is required in Carrigtohill due to the nature of the watercourses, ongoing development and work recently undertaken by Cork County Council at the Slatty Bridge Pumping Station.</p> |                       |                                                                                                                                               |

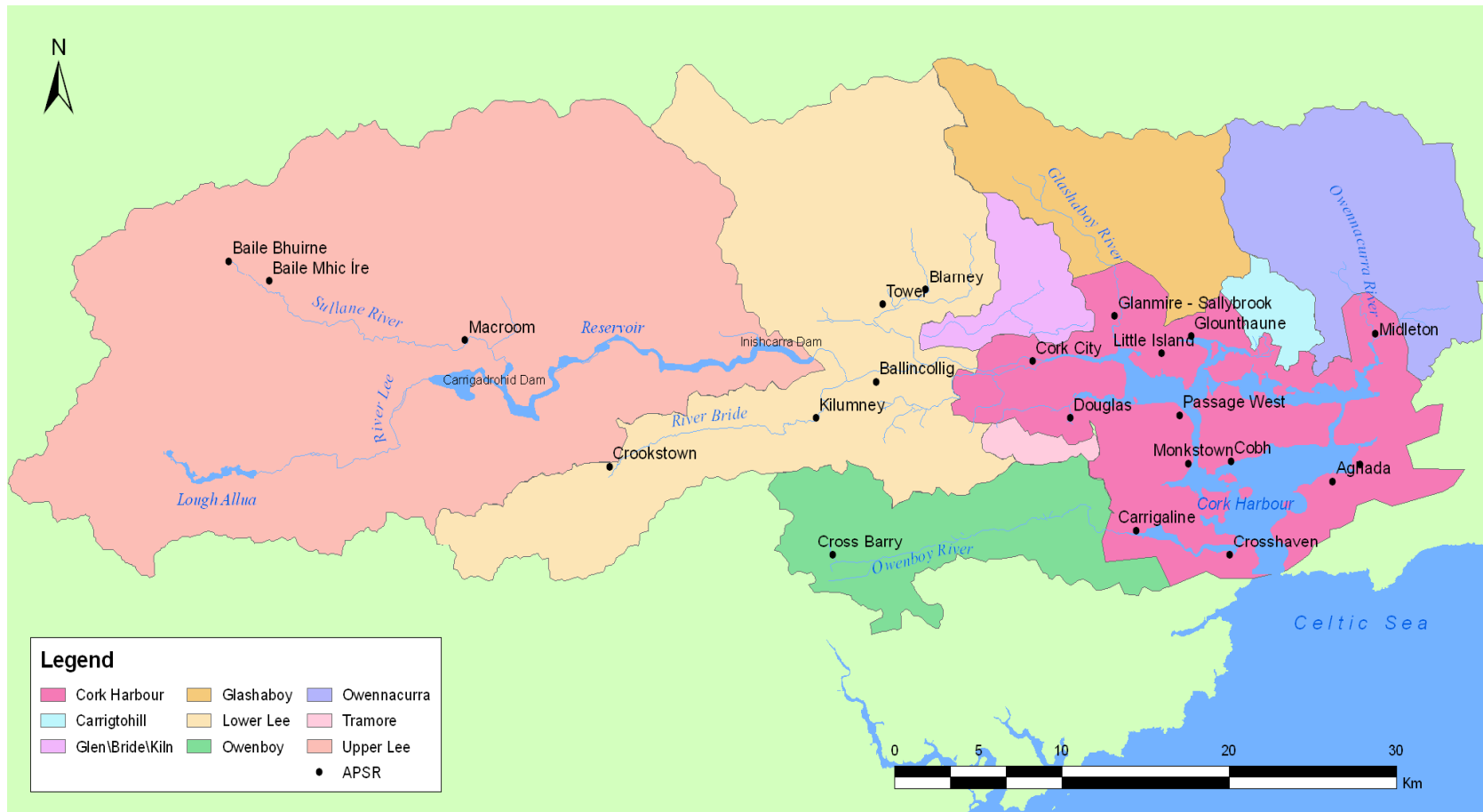


Figure 2-2: AUs and APSRs in the Lee catchment (overlap between areas of tidal influence in fluvial AUs, and the Cork Harbour AU, are not shown)

Following a comprehensive multi-criteria option assessment process<sup>8</sup>, preferred flood risk management options have been recommended in the CFRMP for each AU and APSR; these are summarised in Table 2-2.

Table 2-2: Preferred options identified for AUs and APSRs

| Spatial scale                                                                                         | Preferred Options                                                                                                                                           | Comments                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Analysis Unit (AU)</b>                                                                             |                                                                                                                                                             |                                                                                                                                                                                                                                                                |
| Upper Lee and Lower Lee AUs                                                                           | Fluvial flood forecasting and warning system, combined with targeted public awareness campaign and individual property protection                           | To include coverage of Baile Bhúirne/ Baile Mhic Íre, Macroom and Cork City, and also Crookstown, Kilmoney, and Ballincollig                                                                                                                                   |
| Lower Lee AU                                                                                          | Operation of Carrigadrohid and Inniscarra Dams to further optimise flood risk management potential, informed by flood forecasting                           | Potential benefits to downstream areas, including Cork City. This option is, however, only likely to have any significant benefits in terms of reducing flood risk if it is undertaken in conjunction with the Localised Works (refer to Cork City APSR below) |
| Harbour Area AU                                                                                       | Tidal flood forecasting/warning system, combined with a targeted public awareness and education campaign and individual property protection/ flood-proofing | Covers Cork City, Carrigaline; Monkstown/ Passage West; Glanmire/Sallybrook; Little Island; Glounthaune; Midleton; Rostellan/Aghada; and Cobh and other areas around the harbour                                                                               |
| Owenboy AU*                                                                                           | Fluvial flood forecasting system, combined with a targeted public awareness and education campaign and individual property protection                       | To include coverage of Carrigaline                                                                                                                                                                                                                             |
| Glashaboy AU*                                                                                         | Fluvial flood forecasting system, combined with a targeted public awareness and education campaign and individual property protection                       | To provide coverage of Glanmire/Sallybrook                                                                                                                                                                                                                     |
| Owennacurra AU*                                                                                       | Fluvial flood forecasting system, combined with a targeted public awareness and education campaign and individual property protection                       | To provide coverage of Midleton                                                                                                                                                                                                                                |
| * NB. APSRs around the Harbour Area to be covered by both fluvial and tidal flood forecasting systems |                                                                                                                                                             |                                                                                                                                                                                                                                                                |
| <b>Area of Potential Significant Risk (APSR)</b>                                                      |                                                                                                                                                             |                                                                                                                                                                                                                                                                |
| Baile Bhúirne/                                                                                        | Permanent flood walls and/or                                                                                                                                |                                                                                                                                                                                                                                                                |

<sup>8</sup> Based on the following high-level criteria: applicability; technical feasibility; economic feasibility; social acceptability; and environmental acceptability

| Spatial scale       | Preferred Options                                                                           | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Baile Mhic Íre      | embankments in Baile Mhic Íre                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Macroom             | Permanent flood walls and/or embankments                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Cork City           | Permanent flood walls and/or embankments to manage both tidal and fluvial risk              | <p>NB. "Localised Works" can be progressed as a stand-alone measure to provide a certain (not necessarily 100-yr) standard of protection against tidal and fluvial flooding, and potentially as a component of the improved dam operation option.</p> <p>NB. If tidal barriers are constructed at some time in the future the tidal defences would become redundant. The possible timescale for this is &gt;50 years and should not affect the decision making process at this stage.</p> |
| Douglas/Togher      | Improvement in channel conveyance at Togher (to manage fluvial risk)                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Carrigaline         | Permanent flood walls and/or revetments and/or embankments to manage tidal and fluvial risk |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Glanmire/Sallybrook | Permanent flood walls and/or embankments to manage fluvial risk                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Midleton            | Permanent flood walls and/or embankments to manage both tidal and fluvial risk              | <p>NB. If tidal barriers are constructed at some time in the future the tidal defences would become redundant. The possible timescale for this is &gt;50 years and should not affect the decision making process at this stage.</p>                                                                                                                                                                                                                                                       |
| Cobh                | Permanent flood/sea walls and/or revetments and/or embankments                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Blarney and Tower   | Proactive maintenance of existing flood defence embankment at Tower                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Little Island       | Improvement of existing defences                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Crookstown          | Permanent flood walls and/or embankments                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

Table 2-3 anticipates the possible outcome of discussions of the individual risk receptors with their owners, and adoption of the CFRMP components in Table 2-2. The IRRs listed in Table 2-3 are based on the criteria that they are at risk from greater than 100mm flood depth from a 1% AEP<sup>9</sup> fluvial event or 0.5% AEP tidal event.

*Table 2-3: Possible Solutions for Individual Risk Receptors.*

| Risk receptor                              | Owner           | AU/APSR             | Possible solution                                                                                                                                                              |
|--------------------------------------------|-----------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N22 at Baile Mhic Íre                      | Local authority | Baile Mhic Íre APSR | APSR defences + short-term arrangements for temporary road diversion during floods                                                                                             |
| N22 at Macroom                             | Local authority | Macroom APSR        | APSR defences + short-term arrangements for road diversion during floods                                                                                                       |
| Macroom Lackaduff WWTP                     | Local authority | Macroom APSR        | Localised flood defences                                                                                                                                                       |
| Macroom Waste Water Treatment Plant (WWTP) | Local authority | Macroom APSR        | Localised flood defences or relocation of WWTP                                                                                                                                 |
| Blarney/Tower WWTP                         | Local authority | Tower APSR          | Inspection and maintenance of existing defences                                                                                                                                |
| Lee Road Water Treatment Plant (WTP)       | Local authority | Cork City APSR      | Localised flood defences                                                                                                                                                       |
| N8 Lower Glanmire Road                     | Local authority | Cork City APSR      | Temporary road diversion during floods                                                                                                                                         |
| N8, N20, N22 and N27 in Cork City Centre   | Local authority | Cork City APSR      | APSR defences (+ potential Lower Lee AU option - see text regarding reservoir operation in Section 8.4.3) + short-term arrangements for temporary road diversion during floods |
| N22 on Carrigrohane Road                   | Local authority | Lower Lee AU        | Short-term arrangements for temporary road diversion during floods + potentially Lower Lee AU option (see text regarding reservoir operation in Section 8.4.3)                 |

<sup>9</sup> Annual exceedence probability,



| Risk receptor                                                  | Owner           | AU/APSR                                    | Possible solution                                                                               |
|----------------------------------------------------------------|-----------------|--------------------------------------------|-------------------------------------------------------------------------------------------------|
| Cork to Cobh railway line (three locations)                    | Iarnrod Éireann | Cork City, Little Island APSRs, Harbour AU | APSR defences in Little Island + temporary bus service during floods                            |
| Jack Lynch tunnel and N25 north and south of Jack Lynch Tunnel | Local authority | Harbour AU                                 | Inspection and maintenance of existing defences + potential for incremental raising if required |

### 3. The *Natura 2000* or European sites

#### 3.1. Introduction

There are seven European sites in the Lee catchment and these are listed below and shown on Figure 3-1:

- Mullaghanish to Musheramore Mountains Special Protection Area (SPA)
- Mullaghanish Bog Special Area of Conservation (SAC)
- St. Gobnet's Wood SAC
- The Gearagh SAC
- The Gearagh SPA
- Cork Harbour SPA
- Great Island Channel SAC

This assessment does not consider European sites outside the Lee catchment area boundary as they are not hydrologically connected to the Lee river system and will not be affected by the CFRMP. Downstream of Cork Harbour, the nearest European sites are Ballycotton Bay SPA and Sovereign Islands SPA, but these are approximately 20km east and west, respectively, of the harbour entrance. It is considered very unlikely that the preferred flood risk management options for the Lee catchment could have an effect on these sites.

The special conservation interests and conservation objectives of the seven sites under consideration (as published on the NPWS website, 25/03/2013, unless otherwise stated) are described in sections 3.2-3.8 below.

#### 3.2. Mullaghanish to Musheramore Mountains SPA [Site Code 004162]

Mullaghanish to Musheramore Mountains SPA comprises a substantial part of the Boggeragh/Derrynasaggart Mountains and is situated to the north of the Sullane River between Macroom and Baile Bhúirne. At its nearest point, the boundary of the SPA is approximately 900m from the river at Baile Bhúirne, and 400m from the north-eastern edge of St. Gobnet's Wood SAC (the Cascade Wood component – see section 3.4). Most of the site is over 200m in altitude and the principal habitats are upland bog, heath, grassland and coniferous plantations. The SPA is a stronghold for breeding hen harriers, providing excellent nesting and foraging habitat, as well as supporting a small breeding population of merlins. The principal habitat for the hen harriers is the mix of forestry and open areas, and some may nest in tall heather in unplanted bogs and heath.

Full details of the special conservation interests for which the site is identified are listed in Table 3-1.

*Table 3-1: Mullaghanish to Musheramore Mountains SPA special conservation interests<sup>10</sup>*

| Mullaghanish to Musheramore Mountains SPA special conservation interests                      |                        |
|-----------------------------------------------------------------------------------------------|------------------------|
| Birds listed on Annex 1 of Council Directive 2009/147/EC (under Article 4.1 of the Directive) |                        |
| <i>Circus cyaneus</i>                                                                         | Hen harrier (breeding) |

The generic conservation objective for Mullaghanish to Musheramore Mountains SPA is:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: Hen Harrier *Circus cyaneus* (breeding)<sup>11</sup>.

### 3.3. Mullaghanish Bog SAC [Site Code 001890]

Mullaghanish Bog SAC comprises a small area of mountain blanket bog, located 5km north-north-east of Baile Bhúirne around the summit of Mullaghanish Mountain on the Cork/Kerry border. Although small, it is considered to be a good quality mountain blanket bog which is remarkable for its intactness.

Full details of the special conservation interests for which the site is identified are listed in Table 3-2.

*Table 3-2: Mullaghanish Bog SAC special conservation interests<sup>12</sup>*

| Mullaghanish Bog SAC special conservation interests                                    |             |
|----------------------------------------------------------------------------------------|-------------|
| Habitat types listed in Annex II of Council Directive 92/43/EEC (* = priority habitat) | Common Name |
| <b>7130</b> * Blanket bogs (*if active bog)                                            | Blanket bog |

The generic conservation objective for Mullaghanish Bog SAC is:

- To maintain or restore the favourable conservation condition of the Annex I habitat for which the SAC has been selected: [7130] Blanket bog (\* if active only).<sup>13</sup>

<sup>10</sup> NPWS (2013) *Mullaghanish to Musheramore Mountains SPA 004162 Features of Interest*. <http://www.npws.ie/protectedsites/specialprotectionareas/specialprotectionareas/mullaghanish-to-musheramore-mountains-spa/> (Accessed 25/03/2013, at 10:15am)

<sup>11</sup> NPWS (2011) *Conservation objectives for Mullaghanish to Musheramore Mountains SPA [004162]. Generic Version 4.0*. Department of Arts, Heritage & the Gaeltacht. (Accessed 25/03/2013, at 10:15am)

<sup>12</sup> NPWS (2013) *Mullaghanish Bog SAC 001890 Features of Interest*. <http://www.npws.ie/protectedsites/specialareasofconservation/specialareasofconservation/mullaghanish-bog-sac/> (Accessed 25/03/2013, at 10:15am)

<sup>13</sup> NPWS (2011) *Conservation objectives for Mullaghanish Bog SAC [001890]. Generic Version 3.0*. Department of Arts, Heritage & the Gaeltacht. (Accessed 25/03/2013, at 10:15am)

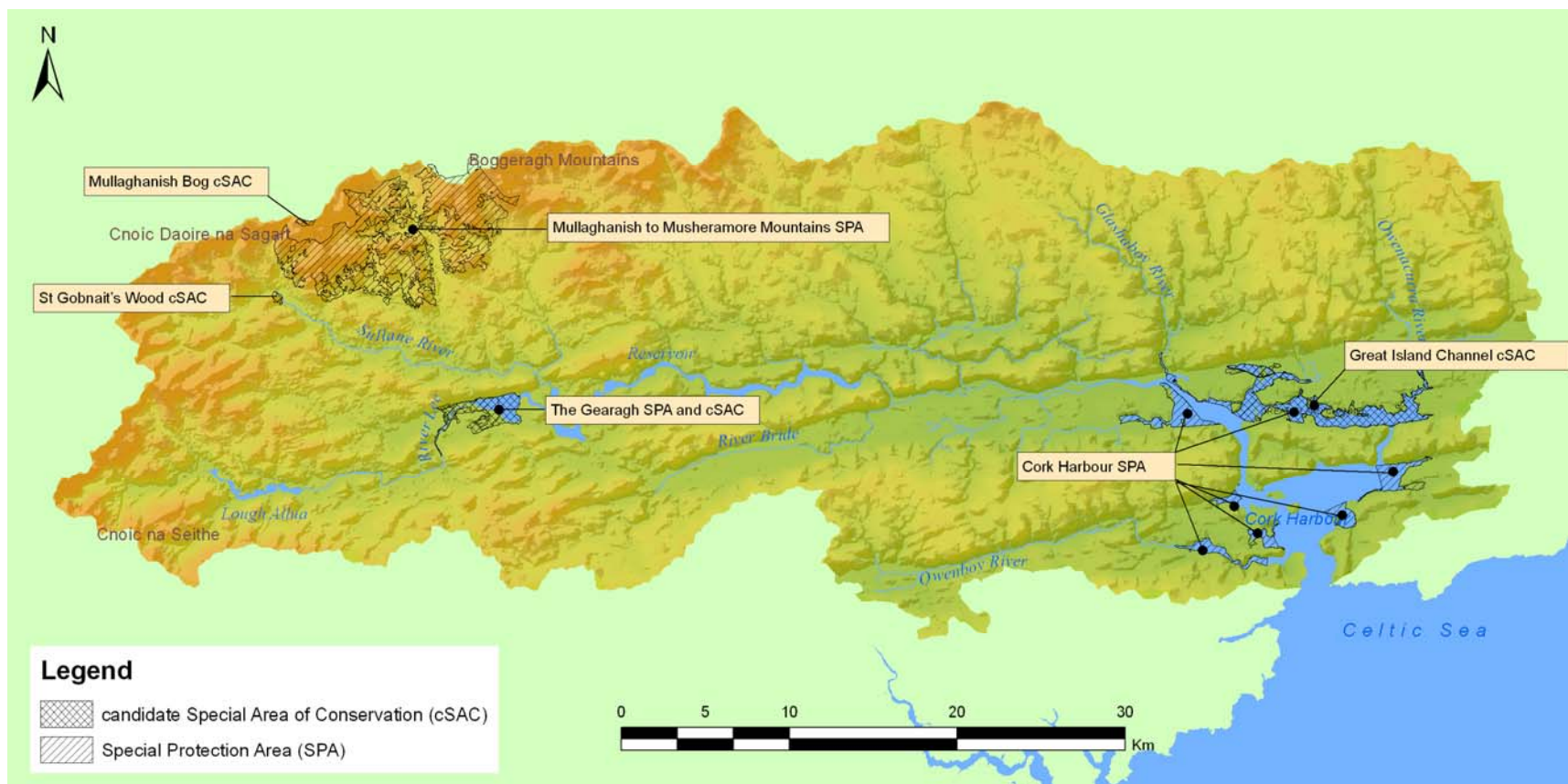


Figure 3-1: Natura 2000 or European sites within the catchment (Source: NPWS) (Note that SACs are now fully designated and no longer only candidates)

### 3.4. St. Gobnet's Wood SAC [Site Code 000106]

St. Gobnet's Wood SAC covers an area of 52.51ha and comprises a relatively large complex of oak woodland, situated on rocky slopes on either side of the River Sullane at Baile Bhúirne. The area of woodland on the north side of the river is known as Cascade Wood, and St. Gobnet's Wood itself is on the south side. The woodland is of value as a good example of old oak woodland and is notable for its particularly rich ground flora. It is also habitat for the Kerry spotted slug *Geomalacus maculosus* and a foraging area for seven species of bat.

Full details of the special conservation interests for which the site is identified are listed in Table 3-3.

Table 3-3: St. Gobnet's Wood SAC special conservation interests<sup>14</sup>

| St.Gobnet's Wood SAC special conservation interests                                                                                                                                                    |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Habitat types listed in Annex I of Council Directive 92/43/EEC (* = priority habitat)                                                                                                                  | Common Name                           |
| <b>91A0</b> Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles (Category B: good representativity)                                                                        | Oak woodland with holly and hard fern |
| <b>91E0</b> * Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) (Category D: non-significant presence) | Alluvial forest with alder and ash    |

The generic conservation objective for St. Gobnet's Wood SAC is:

- To maintain or restore the favourable conservation condition of the the Annex 1 habitat for which the SAC has been selected: 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles.<sup>15</sup>

Note that, whilst habitat type 91E0 is listed as a special conservation interest, it does not feature in the generic conservation objective for the SAC, presumably because of its non-significant presence in the SAC.

### 3.5. The Gearagh SAC [Site Code 000108]

The Gearagh SAC covers an area of 557.95ha and comprises a 7km section of the River Lee, including the confluence with the River Toon, and is located c.2km south-west of Macroom. It is situated in a wide flat valley and the eastern part of the site has been flooded by the Carrigadrohid dam and is subject to artificial fluctuations in water levels. The site contains the only extensive alluvial forest in Western Europe west of the Rhine, and there is also a good,

<sup>14</sup> NPWS (2013) St. Gobnet's Wood SAC 000106 Features of Interest.  
<http://www.npws.ie/protectedsites/specialareasofconservationsac/stgobnetswoodsac/> (Accessed 25/03/2013 at 10:15am)

<sup>15</sup> NPWS (2011) Conservation objectives for St. Gobnet's Wood SAC [000106]. Generic Version 3.0. Department of Arts, Heritage & the Gaeltacht.

though small, example of an intact oak woodland. The aquatic riverine vegetation is well-developed, areas of alluvial grassland are important for wintering waterfowl, and otters occur throughout the site.

Full details of the special conservation interests for which the site is identified are listed in Table 3-4.

Table 3-4: The Gearagh SAC special conservation interests<sup>16</sup>

| The Gearagh SAC special conservation interests                                                                                                                                                           |                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Habitat types listed in Annex I of Council Directive 92/43/EEC (* = priority habitat)                                                                                                                    | Common Name                                                             |
| <b>3260</b> Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation (Category A: excellent representativity)                         | Plain and submountainous rivers with floating water crowfoot vegetation |
| <b>91A0</b> Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles (Category B: good representativity)                                                                          | Oak woodland with holly and hard fern                                   |
| <b>91E0</b> * Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) (Category A: excellent representativity) | Alluvial forest with alder and ash                                      |
| Mammals listed in Annex II of Council Directive 92/43/EEC                                                                                                                                                |                                                                         |
| <b>1355</b> <i>Lutra lutra</i>                                                                                                                                                                           | Otter                                                                   |

The generic conservation objective for The Gearagh SAC is:

- To maintain or restore the favourable conservation condition of the Annex I habitats and the Annex II species for which the SAC has been selected:
  - o [91A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles;
  - o [3260] Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation;
  - o [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*);
  - o [1355] *Lutra lutra*.<sup>17</sup>

<sup>16</sup> NPWS (2013) *The Gearagh SAC 000108 Features of Interest*.  
<http://www.npws.ie/protectedsites/specialareasofconservationsac/thegearahsac/> (Accessed 25/03/2013, 10:15am)

<sup>17</sup> NPWS (2011) *Conservation objectives for The Gearagh SAC [000108]. Generic Version 3.0*. Department of Arts, Heritage & the Gaeltacht.

### 3.6. The Gearagh SPA [Site Code 004109]

The Gearagh SPA covers an area of 322.79ha from Annahala Bridge westwards to Toon bridge and, therefore, covers the central and western parts of the SAC. The site supports important populations of wintering waterfowl, including swans, dabbling duck, diving duck and some waders. Six of the species have populations of national importance. The principal habitat for birds is a shallow lake which is fringed by wet woodland, scrub and grassland that is prone to flooding. Habitat quality is good and the site provides both feeding and roost sites for the birds.

Full details of the special conservation interests for which the site is identified are listed in Table 3-5.

*Table 3-5: The Gearagh SPA special conservation interests<sup>18</sup>*

| The Gearagh SPA special conservation interests                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Regularly occurring migratory birds not listed on Annex 1 of Council Directive 2009/147/EC (under Article 4.2 of the Directive)</b> |
| <i>Anas penelope</i> Wigeon<br><i>Anas crecca</i> Teal<br><i>Anas platyrhynchos</i> Mallard<br><i>Fulica atra</i> Coot                 |
| <b>Also under Article 4.2 of the Directive</b>                                                                                         |
| Wetlands                                                                                                                               |

New generic or site specific conservation objectives have not yet been published (25/03/2013) for the Gearagh SPA. However, the draft main conservation objective for The Gearagh SPA is:

- To maintain the special conservation interests for this SPA at favourable conservation status: wetland and waterbirds.<sup>19</sup>

### 3.7. Cork Harbour SPA [Site Code 004030]

Cork Harbour is a large, sheltered bay system covering an area of 430km<sup>2</sup>, and incorporates the estuaries of several rivers – principally the Rivers Lee, Douglas, Tramore, Owenboy and Owennacurra. The SPA covers an area of 1,428ha and comprises the main intertidal areas, including all of the North Channel, the Douglas Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy Estuary, Whitegate Bay and the Rostellan inlet. Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country.

<sup>18</sup> NPWS (2013) *The Gearagh SPA 004109 Features of Interest*.

<http://www.npws.ie/protectedsites/specialprotectionareasspa/thegearaghspa/> (Accessed 25/03/2013, at 13:00)

<sup>19</sup> Draft conservation objectives supplied by NPWS (R. Jeffrey, *pers. comm.*) in 2009.



Full details of the special conservation interests for which the site is identified are listed in Table 3-6.

Table 3-6: Cork Harbour SPA special conservation interests<sup>20</sup>

| Cork Harbour SPA special conservation interests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Birds listed on Annex 1 of Council Directive 2009/147/EC (under Article 4.1 of the Directive)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Pluvialis apricaria</i> Golden plover (wintering)<br><i>Limosa lapponica</i> Bar-tailed godwit (wintering)<br><i>Sterna hirundo</i> Common tern (breeding)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Regularly occurring migratory birds not listed on Annex 1 of Council Directive 2009/147/EC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>Tachybaptus ruficollis</i> Little grebe (wintering)<br><i>Podiceps cristatus</i> Great crested grebe (wintering)<br><i>Phalacrocorax carbo</i> Cormorant (wintering)<br><i>Ardea cinerea</i> Grey heron (wintering)<br><i>Tadorna tadorna</i> Shelduck (wintering)<br><i>Anas penelope</i> Wigeon (wintering)<br><i>Anas crecca</i> Teal (wintering)<br><i>Anas acuta</i> Pintail (wintering)<br><i>Anas clypeata</i> Shoveler (wintering)<br><i>Mergus serrator</i> Goosander (wintering)<br><i>Haematopus ostralegus</i> Oystercatcher (wintering)<br><i>Pluvialis squatarola</i> Grey plover (wintering)<br><i>Vanellus vanellus</i> Lapwing (wintering)<br><i>Calidris alpina</i> Dunlin (wintering)<br><i>Limosa limosa</i> Black-tailed godwit (wintering)<br><i>Numenius arquata</i> Curlew (wintering)<br><i>Tringa totanus</i> Redshank (wintering)<br><i>Chroicocephalus ridibundus</i> Black-headed gull (wintering)<br><i>Larus canus</i> Common gull (wintering)<br><i>Larus fuscus</i> Lesser black-backed gull (wintering) |
| Also under Article 4.2 of the Directive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Wetlands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

The generic conservation objective for Cork Harbour SPA is:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.<sup>21</sup>

<sup>20</sup> NPWS (2013) Cork Harbour SPA 004030 Features of Interest.

<http://www.npws.ie/protectedsites/specialprotectionareasspa/corkharboursipa/> (Accessed 25/03/2013, at 13:00)

### 3.8. Great Island Channel SAC [Site Code 001055]

Great Island Channel SAC covers an area of 1443.21ha and comprises the north-eastern part of Cork Harbour. It includes all of the Great Island Channel, the intertidal areas between Fota Island and Little Island, and also the estuary of the Dungourney and Owennacurra Rivers as far as Midleton. The site is of ecological importance for its examples of intertidal mud and sand flats and Atlantic salt meadows of the estuarine type. Both habitats are fairly extensive in area and of moderate to good quality. The site has high ornithological importance, supporting regularly c.50% of the wintering waterfowl of Cork Harbour. In addition to the estuarine habitats, the site includes some wet grassland areas which are used by roosting birds, as well as some broad-leaved woodland at Fota Island.

Full details of the special conservation interests for which the site is identified are listed in Table 3-7.

Table 3-7: Great Island Channel SAC special conservation interests<sup>22</sup>

| Great Island Channel SAC special conservation interests                                                            |                                                             |
|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Habitat types listed in Annex I of Council Directive 92/43/EEC (* = priority habitat)                              | Common name                                                 |
| <b>1140</b> Mudflats and sandflats not covered by sea water at low tide (Category B: good representativity)        | Mudflats and sandflats not covered by sea water at low tide |
| <b>1330</b> Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) (Category B: good representativity) | Atlantic salt meadows (saltmarshes)                         |
| <b>1130</b> Estuaries (Category D: non-significant presence)                                                       | Estuaries                                                   |
| <b>1320</b> Spartina swards ( <i>Spartinion maritimae</i> ) (Category D: non-significant presence)                 | Cord-grass swards (saltmarshes)                             |

The generic conservation objective for Great Island Channel SAC is:

- To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected:
  - o [1140] Mudflats and sandflats not covered by seawater at low tide;
  - o [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).<sup>23</sup>

<sup>21</sup> NPWS (2011) *Conservation objectives for Cork Harbour SPA [004030]. Generic Version 4.0.* Department of Arts, Heritage & the Gaeltacht. (Accessed 25/03/2013, at 13:00)

<sup>22</sup> NPWS (2013) *Great Island Channel SAC 001058 Features of Interest.* <http://www.npws.ie/protectedsites/specialareasofconservationsac/greatislandchannelsac/> (Accessed 25/03/2013, at 14:30)

<sup>23</sup> NPWS (2011) *Conservation objectives for Great Island Channel SAC [001058]. Generic Version 3.0.* Department of Arts, Heritage & the Gaeltacht.

Note that, whilst habitat types 1130 and 1320 are listed as a special conservation interest, they do not feature in the generic conservation objective for the SAC, presumably because of their non-significant presence in the SAC.

## 4. Screening Assessment

### 4.1. Initial screening

The preparation of the Lee CFRMP is not necessary for the management of any of the European sites in the River Lee catchment. Therefore, further assessment of the potential impacts of this Plan is required under Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

### 4.2. Identification of likely impacts on European sites

This section reports the results of the screening assessment, identifying whether the preferred flood risk management options identified in the Lee CFRMP are likely to have a significant impact, either alone or in combination with other projects and plans, on the European sites within the area of the catchment to be affected by the plan. It was considered that none of options for the Individual Risk Receptors (IRR) are likely to have a significant impact on the European sites as they consist of localised works or operations such as: flood defences around specific installations; maintenance of existing local defences; temporary traffic diversions and bus services during floods. The assessment described below is, therefore, based entirely on the options for the AUs and APSRs and was undertaken in parallel with the Strategic Environmental Assessment (SEA).

Where there is uncertainty about the likelihood of a preferred option having a significant impact on a site, but a risk exists, the precautionary principle is applied so that it is assumed that a significant impact is likely. The precautionary principle also applies to the identification of the potential for in-combination effects which was also undertaken as part of the SEA. At this screening stage, the assessment of in-combination effects was restricted to the identification of projects and plans that are relevant to the AUs and APSRs being considered, and was investigated further in the next stage of the assessment – the Appropriate Assessment.

The screening assessment was undertaken in 2009 on the basis of the designated features identified at the time in the European sites documentation described in section 1.3, and that is reflected in the results presented in Table 4-1.

Table 4-1: Screening assessment of the potential effects of the proposed Lee CFRMP on European sites in the catchment, based on Site Synopses and the Natura 2000 Standard Data Forms correct in September 2009.

| European sites, interest features and present condition <sup>24</sup>                                                    | CFRMP preferred options and potential issues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Identification of the likelihood of a significant effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mullaghanish to Musheramore Mountains SPA</b>                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>Birds listed on Annex 1 of Directive 2009/147/EC (Hen harrier, Merlin)</li> </ul> | <p><i>Upper Lee and Lower Lee AUs</i><br/>Preferred option: Fluvial flood forecasting and warning system, combined with targeted public awareness campaign and individual property protection.</p> <p><i>Baile Bhúirne/ Baile Mhic Íre APSR</i><br/>Preferred option: Permanent flood walls and/or embankments in Baile Mhic Íre.</p> <p>Potential issues:</p> <ul style="list-style-type: none"> <li>Change in flood inundation extent and frequency.</li> <li>Habitat destruction or damage.</li> <li>Disturbance.</li> </ul> | <p><i>Upper Lee and Lower Lee AUs</i><br/>The application of the preferred option for the Upper Lee and Lower Lee AUs would not result in a change of flood risk to Mullaghanish to Musheramore Mountains SPA beyond the baseline situation. It is, therefore, concluded that <b>no significant effect is likely</b>.</p> <p><i>Baile Bhúirne/ Baile Mhic Íre APSR</i><br/>The application of the preferred option in Baile Mhic Íre would involve the building of a new embankment along the left bank of the river channel, approximately 900m from the SPA. Owing to the distance and the fact that most of the SPA is over 200m in altitude, well above the flood plain, it is concluded that <b>no significant effect is likely</b>.</p> <p>All the other AUs and APSRs are downstream of the site, and effects are unlikely to result from their preferred options.</p> |
| <b>Mullaghanish Bog SAC</b>                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>Blanket bog</li> </ul>                                                            | <p><i>Upper Lee and Lower Lee AUs</i><br/>Preferred option: Fluvial flood forecasting and warning system, combined with targeted public awareness campaign</p>                                                                                                                                                                                                                                                                                                                                                                  | <p><i>Upper Lee and Lower Lee AUs</i><br/>The application of the preferred option for the Upper Lee and Lower Lee AUs would not result in a change of flood risk to Mullaghanish Bog SAC, beyond the baseline situation. It is, therefore, concluded that <b>no significant effect is likely</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

<sup>24</sup> As described in the Site Synopses and the Natura 2000 Standard Data Forms.

| European sites, interest features and present condition <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                      | CFRMP preferred options and potential issues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Identification of the likelihood of a significant effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>and individual property protection.</p> <p><i>Baile Bhúirne/ Baile Mhic Íre APSR</i><br/>Preferred option: Permanent flood walls and/or embankments in Baile Mhic Íre.</p> <p>Potential issues:</p> <ul style="list-style-type: none"> <li>• Change in flood inundation extent and frequency.</li> </ul>                                                                                                                                                                                                                                                                                                                            | <p><i>Baile Bhúirne/ Baile Mhic Íre APSR</i><br/>The application of the preferred option in Baile Mhic Íre would involve the building of a new embankment along the left bank of the river channel, approximately 5km from the SAC. Owing to the distance and the high altitude of the SAC, it is concluded that <b>no significant effect is likely</b>.</p> <p>All the other AUs and APSRs are downstream of the site, and additional effects are unlikely to result from their preferred options.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>St. Gobnet's Wood SAC</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• Oak woodland with holly and hard fern</li> <li>• Alluvial forest with alder and ash</li> </ul> <p>Present condition and vulnerability:</p> <ul style="list-style-type: none"> <li>• The site is partially degraded through the presence of exotic trees and an area of dense <i>Rhododendron ponticum</i> and <i>Prunus laurocerasus</i>.</li> <li>• Vulnerable to further spread of regenerating exotic trees and to invasion by <i>Rhododendron</i>.</li> </ul> | <p><i>Upper Lee and Lower Lee AUs</i><br/>Preferred option: Fluvial flood forecasting and warning system, combined with targeted public awareness campaign and individual property protection.</p> <p><i>Baile Bhúirne/ Baile Mhic Íre APSR</i><br/>Preferred option: Permanent flood walls and/or embankments in Baile Mhic Íre.</p> <p>The options for the downstream AUs and APSRs are not considered to have any implications for the site because of their geographical/ hydrological position.</p> <p>Potential issues:</p> <ul style="list-style-type: none"> <li>• Change in flood inundation extent and frequency.</li> </ul> | <p><i>Upper Lee and Lower Lee AUs</i><br/>The application of the preferred option for the Upper Lee and Lower Lee AUs would not result in a change of flood risk to St. Gobnet's Wood SAC, beyond the baseline situation. It is, therefore, concluded that <b>no significant effect is likely</b>.</p> <p><i>Baile Bhúirne/ Baile Mhic Íre APSR</i><br/>The application of the preferred option in Baile Mhic Íre would involve the building of a new embankment along the left bank of the river channel, towards the southern end of St Gobnet's Wood SAC (on the right bank). Although the embankment would be outside the SAC, it would reduce floodplain storage along the left bank and may raise water levels and cause increased flood risk along the right bank of the channel. This may pose a risk to St. Gobnet's Wood as there is the potential for increased flooding of the lower parts of the wood, which could cause the composition of plant communities to change. It is, therefore, concluded that <b>a significant effect is likely</b>.</p> <p>All the other AUs and APSRs are downstream of the site, and additional effects are unlikely to result from their preferred options.</p> |

| European sites, interest features and present condition <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | CFRMP preferred options and potential issues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Identification of the likelihood of a significant effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>Habitat destruction or damage.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | There is a potential for in-combination effects with the South Western River Basin District (RBD) Management Plan, Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001-2020 and local area plans and development plans.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>The Gearagh SAC</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>Alluvial forest with alder and ash</li> <li>Plain and submountainous rivers with floating water crowfoot vegetation</li> <li>Oak woodland with holly and hard fern</li> <li>Mammals: Otter</li> </ul> <p>Present condition and vulnerability:</p> <ul style="list-style-type: none"> <li>The eastern part of the site is subject to artificial fluctuations in water levels</li> <li>No major threats to the site, although some damage to marginal areas from drainage attempts and grazing/ poaching by cattle. Illegal removal of timber may occur from time to time. The aquatic communities could be adversely affected by eutrophication.</li> </ul> | <p><i>Upper Lee and Lower Lee AUs</i><br/>Preferred option: Fluvial flood forecasting and warning system, combined with targeted public awareness campaign and individual property protection.</p> <p><i>Lower Lee AU</i><br/>Preferred Option: Operation of Carrigadrohid and Inniscarra Dams to further optimise flood risk management potential, informed by integrated flood forecasting.</p> <p>The options for Macroom APSR and the downstream AUs and APSRs are not considered to have any implications for the site because of their geographical/ hydrological position.</p> <p>Potential issues:</p> <ul style="list-style-type: none"> <li>Change in flood inundation extent and frequency.</li> <li>Disturbance</li> </ul> | <p><i>Upper Lee and Lower Lee AUs</i><br/>The application of the preferred option for the Upper Lee and Lower Lee AUs would not result in a change of flood risk to The Gearagh SAC, beyond the baseline situation. It is, therefore, concluded that <b>no significant effect is likely</b>.</p> <p><i>Lower Lee AU</i><br/>The application of the preferred option in Lower Lee AU would involve a reduction in levels in the Carrigadrohid and Inniscarra reservoirs prior to a flood event, and a possible maintenance of lower levels at certain times of year. This could lead to a lowering of water levels in the Gearagh and adversely affect the wetland habitats and species of the SAC, but there is uncertainty at present as to the likelihood, extent or effect of any water level changes. Nevertheless, as a result of uncertainty, the precautionary principle is applied and it is concluded that <b>a significant effect is likely</b>.</p> <p>All the other AUs and APSRs are downstream of the site, or not hydrologically connected to the site, and additional effects are unlikely to result from their preferred options.</p> <p>There is a potential for in-combination effects with the South Western River Basin District (RBD) Management Plan, Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001-2020 and local area plans and development plans.</p> |
| <b>The Gearagh SPA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>Birds listed on Annex 1 of Council</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <i>Upper Lee and Lower Lee AUs</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <i>Upper Lee and Lower Lee AUs</i><br>The application of the preferred option for                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



| European sites, interest features and present condition <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | CFRMP preferred options and potential issues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Identification of the likelihood of a significant effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| <p>Directive 79/409/EEC (Whooper swan, Golden plover)</p> <ul style="list-style-type: none"> <li>Regularly occurring migratory birds not listed on Annex 1 of Council Directive 79/409/EEC (Cormorant, Wigeon, Teal, Pintail, Gadwall, Mallard, Shoveler, Lapwing, Curlew, Pochard, Tufted duck, Goldeneye, Coot)</li> </ul> <p>Present condition and vulnerability:</p> <ul style="list-style-type: none"> <li>Habitat quality is good and the site provides both feeding and roosting sites for the birds on the lake and surrounding wet grassland.</li> <li>There are no imminent threats to the wintering bird populations as the site is a nature reserve. However, some disturbance from illegal shooting.</li> </ul> | <p>Preferred option: Fluvial flood forecasting and warning system, combined with targeted public awareness campaign and individual property protection.</p> <p><i>Lower Lee AU</i><br/>Operation of Carrigadrohid and Inniscarra Dams to further optimise flood risk management potential, informed by integrated flood forecasting.</p> <p>The options for Macroom APSR and the downstream AUs and APSRs are not considered to have any implications for the site because of their geographical/hydrological position.</p> <p>Potential issues:</p> <ul style="list-style-type: none"> <li>Change in flood inundation extent and frequency.</li> <li>Disturbance</li> </ul> | <p>the Upper Lee and Lower Lee AUs would not result in a change of flood risk to The Gearagh SPA, beyond the baseline situation. It is, therefore, concluded that <b>no significant effect is likely</b>.</p> <p><i>Lower Lee AU</i><br/>The application of the preferred option in Lower Lee AU would involve a reduction in levels in the Carrigadrohid and Inniscarra reservoirs prior to a flood event, and a possible maintenance of lower levels at certain times of year. This could lead to a lowering of water levels in the Gearagh and adversely affect the SPA species and their habitats, but there is uncertainty at present as to the likelihood, extent or effect of any water level changes. Nevertheless, as a result of uncertainty, the precautionary principle is applied and it is concluded that <b>a significant effect is likely</b>.</p> <p>All the other AUs and APSRs are downstream of the site, or not hydrologically connected to the site, and additional effects are unlikely to result from their preferred options.</p> <p>There is a potential for in-combination effects with the South Western River Basin District (RBD) Management Plan, Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001-2020 and local area plans and development plans.</p> |
| <b>Cork Harbour SPA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>Birds listed on Annex 1 of Directive 2009/147/EC habitats (Golden plover, Bar-tailed godwit, Whooper swan, Ruff, Common tern)</li> <li>Regularly occurring migratory birds not listed on Annex 1 of Directive</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p><i>Upper Lee and Lower Lee AUs, Harbour Area AU, Owenboy AU, Glashaboy AU, Owennacurra AU</i> all have similar preferred options involving flood forecasting and warning systems, public awareness</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>The application of the preferred option for the Upper Lee and Lower Lee AUs, Harbour Area AU, Owenboy AU, Glashaboy AU, Owennacurra AU would not result in a change of flood risk to Cork Harbour SPA, beyond the baseline situation. It is, therefore, concluded that <b>no significant effect is likely</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| European sites, interest features and present condition <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | CFRMP preferred options and potential issues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Identification of the likelihood of a significant effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| <p>2009/147/EC habitats (Little grebe, Great crested grebe, Cormorant, Grey heron, Shelduck, Wigeon, Teal, Pintail, Gadwall, Mallard, Shoveler, Goosander, Oystercatcher, Grey plover, Lapwing, Dunlin, Black-tailed godwit, Curlew, Redshank, Greenshank, Turnstone, Black-headed gull, Common gull, Pochard, Tufted duck, Goldeneye, Coot, Ringed plover, Knot, Lesser black-backed gull, Spotted redshank, Green sandpiper)</p> <p>Present condition and vulnerability:</p> <ul style="list-style-type: none"> <li>• The quality of most of the estuarine habitats is good.</li> <li>• There are no serious imminent threats to the wintering birds.</li> <li>• Though the intertidal areas receive polluted water, there are no apparent significant impacts on the flora and fauna. Oil pollution from shipping is a general threat.</li> <li>• Recreational activities are high in some areas, including jet skiing which causes disturbance to roosting birds. High tide roosts occur on saltmarshes, stony</li> </ul> | <p>and education campaigns, and individual property protection.</p> <p><i>Lower Lee AU</i><br/>Preferred option: Operation of Carrigadrohid and Inniscarra Dams to further optimise flood risk management potential, informed by integrated flood forecasting.</p> <p><i>Carrigaline APSR</i><br/>Preferred option: Permanent flood walls and/or revetments and/or embankments to manage tidal and fluvial risk.</p> <p><i>Midleton APSR</i><br/>Preferred option: Permanent flood walls and/or embankments to manage both tidal</p> | <p><i>Lower Lee AU</i><br/>The application of the preferred option in Lower Lee AU would involve a reduction in levels in the Carrigadrohid and Inniscarra reservoirs prior to a flood event. This could potentially impact on the Cork Harbour SPA as a result of changes in flood flows downstream into the River Lee estuary. The normal physical and biological functioning of estuaries depends in part on the pattern of freshwater inflow, which influences salinity gradients, turbidity and organic matter inputs. Changes could therefore affect the habitats and food supplies of the SPA birds in the River Lee estuary. However, this risk is anticipated to be low given the natural variability of river flow into the estuary and the buffering effect of the distance between the works and the Cork Harbour SPA. It is, therefore, concluded that <b>no significant effect is likely</b>.</p> <p><i>Carrigaline APSR</i><br/>The application of the preferred option in Carrigaline APSR would involve the location of flood walls within/adjacent to the SPA boundaries. Construction of defences downstream of the eastern bridge would result in temporary damage to intertidal habitats, albeit localised, and disturbance to bird populations using the mudflat areas, although this could be reduced if winter working is avoided. In the long term, this option, combined with sea level rise, could result in coastal squeeze and a loss of habitat. The potential impact of this option is considered to be low but, as a result of uncertainty, the precautionary principle is applied and it is concluded that <b>a significant effect is likely</b>.</p> <p><i>Midleton APSR</i><br/>The application of the preferred option in Midleton APSR would involve the construction of flood walls/embankments along the eastern bank of the Owennacurra estuary, in south Midleton, and within the</p> |

| European sites, interest features and present condition <sup>24</sup>                                                                                                                                                       | CFRMP preferred options and potential issues                                                                                      | Identification of the likelihood of a significant effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| <p>shorelines, and fields adjacent to the shore.</p> <ul style="list-style-type: none"> <li>Extensive areas of estuarine habitats have been (re)claimed since the 1950s and further land claim remains a threat.</li> </ul> | <p>and fluvial risk.</p>                                                                                                          | <p>boundaries of the Cork Harbour SPA. However, the works would be restricted to the eastern margin of the estuary and are only likely to directly impact on intertidal habitats along a narrow strip of mudflat between the main channel and Bailick Road. Although the proposed defences would replace existing ones, temporary damage to the intertidal habitats are likely, during construction, along a 10-20m wide strip. The works would also have the potential to cause temporary disturbance to bird populations in this part of the estuary, although this could be reduced if winter working is avoided. In the long term, this option, combined with sea level rise, could result in coastal squeeze and a loss of habitat. The potential impact of this option is considered to be low but, as a result of uncertainty, the precautionary principle is applied and it is concluded that <b>a significant effect is likely</b>.</p> |
|                                                                                                                                                                                                                             | <p><i>Douglas/ Togher APSR</i><br/>Preferred option: Improvement in channel conveyance in Togher (to manage fluvial risk)</p>     | <p><i>Douglas/ Togher APSR</i><br/>The application of the preferred option in Togher, to improve channel conveyance, has the potential to increase volumes of flood flows downstream into the upper parts of the estuary. This would present a risk of potential physical changes to the estuarine habitats within the SPA with resulting impacts on waterbird populations. However, the risk of this option affecting flood flow volumes and frequencies, beyond the range of natural variation, is anticipated to be very low. It is, therefore, concluded that <b>no significant effect is likely</b>.</p>                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                             | <p><i>Cork City APSR</i><br/>Preferred option: Permanent flood walls and/or embankments to manage both tidal and fluvial risk</p> | <p><i>Cork City APSR</i><br/>The application of the preferred option in Cork City APSR would involve construction of permanent flood walls and/or embankments to manage both tidal and fluvial risk. The construction of flood walls would not affect the Cork Harbour SPA, as this is situated over 3km downstream. It is, therefore, concluded that <b>no significant effect is likely</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| European sites, interest features and present condition <sup>24</sup> | CFRMP preferred options and potential issues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Identification of the likelihood of a significant effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                       | <p><i>Glanmire/Sallybrook APSR</i><br/>Preferred option: Permanent flood walls and/or embankments to manage fluvial risk</p> <p><i>Little Island APSR</i><br/>Preferred option: Improvement of existing defences</p> <p><i>Cobh APSR</i><br/>Preferred option: Permanent flood/sea walls and/or revetments and/or embankments</p> <p>Potential issues across the APSRs:</p> <ul style="list-style-type: none"> <li>• Change in flood inundation extent and frequency.</li> <li>• Downstream hydrological changes.</li> <li>• Habitat destruction or damage.</li> <li>• Disturbance</li> </ul> | <p><i>Glanmire/Sallybrook APSR</i><br/>The application of the preferred option in Glanmire/Sallybrook APSR would involve the construction of permanent flood walls and/or embankments to manage fluvial risk. However, the proposed flood walls lie more than 2km upstream of the boundaries of the SPA. As such, there is no potential for direct impacts on these sites through the construction of this structure. The new structure would be set back from the river bank so would have no effect on flows in the channel. It is, therefore, concluded that <b>no significant effect is likely</b>.</p> <p><i>Little Island APSR</i><br/>The application of the preferred option in Little Island APSR would involve the improvement of existing defences. There is potential for temporary encroachment on the intertidal habitats of the Cork Harbour SPA, during the course of the works, and disturbance to birds using the habitats. It is uncertain at this stage the extent of the effect, consequently the precautionary principle is applied and it is concluded that <b>a significant effect is likely</b>.</p> <p><i>Cobh APSR</i><br/>The Cobh APSR is separated by over 1km of open estuary from the nearest part of the Cork Harbour SPA. The application of the preferred option for the Cobh APSR would involve works restricted to an artificial frontage, with no significant connectivity with the SPA. Consequently, although there is likely to be temporary loss of or disturbance to littoral flora and fauna on artificial habitat during the construction of the floodwalls, there is unlikely to be any effect on Cork Harbour SPA. It is, therefore, concluded that <b>no significant effect is likely</b>.</p> <p>Baile Bhúirne/ Baile Mhic Íre APSR, Macroom APSR, Crookstown APSR and Blarney/Tower APSR are between 15 and 60km upstream of Cork Harbour, and it is unlikely that any effects would result from the application of their preferred options.</p> <p>There is a potential for in-combination effects with the South Western River Basin District</p> |

| European sites, interest features and present condition <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CFRMP preferred options and potential issues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Identification of the likelihood of a significant effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (RBD) Management Plan, Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001-2020 and local area plans and development plans.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Great Island Channel SAC</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>• Estuaries;</li> <li>• Mudflats and sandflats not covered by sea water at low tide;</li> <li>• Atlantic salt meadows;</li> <li>• Cord-grass swards</li> </ul> <p>Present condition and vulnerability:</p> <ul style="list-style-type: none"> <li>• The site is relatively undisturbed compared with the rest of Cork Harbour. The mud and sand flats and the Atlantic salt meadows are extensive and of moderate to good quality.</li> <li>• The site receives polluted waters from agricultural, domestic and industrial sources, although levels of pollutants in the water and sediments are not excessive and the site appears to have a normal macro-invertebrate fauna.</li> <li>• A major road has recently been constructed across intertidal flats in the north-western sector, and land claim continues to be a threat.</li> <li>• Cord grass (<i>Spartina</i>) is well</li> </ul> | <p><i>Harbour Area AU</i>, Preferred option: Tidal flood forecasting/warning system, combined with a targeted public awareness and education campaign and individual property protection/ flood-proofing</p> <p><i>Owennacurra AU</i>, Preferred option: Fluvial flood forecasting system, combined with a targeted public awareness and education campaign and individual property protection</p> <p><i>Middleton APSR</i>, Preferred option: Permanent flood walls and/or embankments to manage both tidal and fluvial risk</p> | <p>The application of the preferred options for the <i>Harbour Area AU</i> and <i>Owennacurra AU</i> would not result in a change of flood risk to Great Island Channel SAC, beyond the baseline situation. It is, therefore, concluded that <b>no significant effect is likely</b>.</p> <p><i>Middleton APSR</i></p> <p>The application of the preferred option in Middleton APSR would involve the construction of flood walls/embankments along the eastern bank of the Owennacurra estuary, in south Middleton, and within the boundaries of the Great Island Channel SAC. However, the works would be restricted to the eastern margin of the estuary and are only likely to directly impact on intertidal habitats along a narrow strip of mudflat between the main channel and Bailick Road. Although the proposed defences would replace existing ones, temporary damage to the intertidal habitats are likely, during construction, along a 10-20m wide strip. In the long term, this option, combined with sea level rise, could result in coastal squeeze and a loss of habitat. The potential impact of this option is considered to be low but, as a result of uncertainty, the precautionary principle is applied and it is concluded that <b>a significant effect is likely</b>.</p> |

| European sites, interest features and present condition <sup>24</sup>        | CFRMP preferred options and potential issues                                                                                                                                                                                                                                   | Identification of the likelihood of a significant effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| established and may have caused some alterations to the intertidal habitats. | <p><i>Little Island APSR</i><br/>Preferred option: Improvement of existing defences</p> <p>Potential issues across the APSRs:</p> <ul style="list-style-type: none"> <li>• Change in flood inundation extent and frequency</li> <li>• Habitat destruction or damage</li> </ul> | <p><i>Little Island APSR</i><br/>The application of the preferred option in Little Island APSR would involve the improvement of existing defences. There is potential for temporary encroachment on the intertidal habitats of the Great Island Channel SAC, during the course of the works. It is uncertain at this stage the extent of the effect, consequently the precautionary principle is applied and it is concluded that <b>a significant effect is likely</b>.</p> <p>Baile Bhúirne/ Baile Mhic Íre APSR, Macroom APSR, Crookstown APSR and Blarney/Tower APSR are between 15 and 60km upstream of Cork Harbour, and Cork City APSR, Douglas/ Togher APSR, Carrigaline APSR, Cobh APSR are separated from the Great Island Channel cSAC by the Great Island itself and/or the open waters of Cork Harbour, and it is unlikely that any effects would result from the application of their preferred options.</p> <p>There is a potential for in-combination effects with the South Western River Basin District (RBD) Management Plan, Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001-2020 and local area plans and development plans.</p> |

#### 4.3. Conclusions and Recommendations

The proposed Lee CFRMP has the potential to have significant effects, either alone or in-combination, on the ecological integrity of five of the *Natura 2000* or European sites considered: St. Gobnet's Wood SAC, The Gearagh SAC & SPA, Cork Harbour SPA and Great Island Channel SAC. These are summarised below:

- As a result of the application of the preferred option for *Baile Bhúirne/Mhic Íre APSR*, there is a risk of increased flooding of St. Gobnet's Wood which may affect SAC interest features through changes in plant community composition.
- As a result of the application of the preferred option for the *Lower Lee AU*, there is a risk of lowered water levels in The Gearagh which may affect SAC and SPA interest features through a change in the conditions of the wetland habitats.
- There is a risk that the application of the preferred options for *Carrigaline APSR*, *Middleton APSR* and *Little Island APSR* may cause habitat damage in Great Island Channel SAC and both habitat damage and disturbance to birds in the Cork Harbour

SPA, particularly if works are undertaken during the peak season(s) for migratory waterfowl populations, and, in the long term, may lead to loss of habitat in both sites through coastal squeeze.

This conclusion means that the assessment should proceed to Stage 2 and an appropriate assessment should be undertaken of the CFRMP, focussing on the potential significant adverse effects highlighted above. The subsequent appropriate assessment is documented in Chapter 5.



## 5. Appropriate Assessment

### 5.1. Introduction to the appropriate assessment

The screening stage (Stage 1) has concluded that the Lee CFRMP has the potential to have significant effects, either alone or in-combination, on the ecological integrity of five of the seven European sites considered, and therefore an appropriate assessment (Stage 2) is required. Table 5-1 is based on, summarises and updates Table 4-1 of the Stage 1 screening assessment, highlighting the special conservation interest features of the European sites which are potentially sensitive and exposed to impacts arising from the implementation of the Lee CFRMP. The special conservation interests and conservation objectives of the seven sites under consideration (as published on the NPWS website, 25/03/2013, unless otherwise stated) are described in Chapter 3.

The detailed appropriate assessment that follows in Sections 5.2-5.6 analyses the potential risks to each of these European sites to determine whether the CFRMP will adversely affect its integrity. It also identifies specific avoidance or mitigation measures to ensure that the plan has no adverse effect on the integrity of the European sites. Finally, a summary and conclusion of the assessment are provided in Section 5.7 and Table 5-2.

This assessment at the Plan level does not remove the need for an Appropriate Assessment at the project level, regardless of whether or not the project is consistent with the CFRMP. As a result of uncertainties concerning the potential impacts of the preferred CFRMP options on the European sites, detail emerging at the scheme or project design stage may identify additional impacts which have not been assessed here. Consequently, any scheme or project arising out of the plan will be assessed to ensure any adverse effects on the integrity of European sites are avoided.

*Table 5-1: European Sites and features potentially sensitive and exposed to risks arising from the proposed Lee CFRMP, based on site details correct in March 2013 (see sections 1.3 and 3.1).*

| Features potentially affected                                                                                                                                                                        | Risks to site                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>St. Gobnet's Wood SAC</b>                                                                                                                                                                         |                                                                                                                                                                         |
| <ul style="list-style-type: none"> <li>• Oak woodland with holly and hard fern</li> <li>• Alluvial forest with alder and ash (non-significant presence)</li> </ul>                                   | <i>Baile Bhúirne/ Mhic Íre APSR.</i> Potential for increased flooding of the lower parts of the wood, which could cause the composition of plant communities to change. |
| <b>The Gearagh SAC</b>                                                                                                                                                                               |                                                                                                                                                                         |
| <ul style="list-style-type: none"> <li>• Alluvial forest with alder and ash</li> <li>• Plain and submountainous rivers with floating water crowfoot vegetation</li> <li>• Mammals (otter)</li> </ul> | <i>Lower Lee AU.</i> Potential for a lowering of water levels in the Gearagh which could adversely affect the wetland habitats and species of the SAC.                  |
| <b>The Gearagh SPA</b>                                                                                                                                                                               |                                                                                                                                                                         |
| <ul style="list-style-type: none"> <li>• Birds listed in Annex 1 of Directive 2009/147/EC</li> <li>• Other regularly occurring migratory birds</li> <li>• Wetland</li> </ul>                         | <i>Lower Lee AU.</i> Potential for a lowering of water levels in the Gearagh which could adversely affect the SPA species and their wetland habitats.                   |
| <b>Cork Harbour SPA</b>                                                                                                                                                                              |                                                                                                                                                                         |
| <ul style="list-style-type: none"> <li>• Birds listed in Annex 1 of Directive 2009/147/EC</li> <li>• Other regularly occurring migratory birds</li> </ul>                                            | <i>Carrigaline APSR, Middleton APSR, Little Island APSR.</i> Temporary damage to intertidal habitats of the SPA, and potential                                          |

| Features potentially affected                                                                                                                                                              | Risks to site                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Wetland</li> </ul>                                                                                                                                  | temporary disturbance to bird populations, during construction. Potential long term habitat loss resulting from coastal squeeze.                                     |
| <b>Great Island Channel SAC</b>                                                                                                                                                            |                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>Estuaries</li> <li>Mudflats and sandflats not covered by sea water at low tide</li> <li>Atlantic salt meadows</li> <li>Cord-grass swards</li> </ul> | <i>Midleton APSR, Little Island APSR.</i> Potential encroachment on intertidal habitats of the SAC. Potential long term habitat loss resulting from coastal squeeze. |

## 5.2. St. Gobnet's Wood SAC

### 5.2.1. Potential risk to site resulting from CFRMP

Potential for increased flooding of the lower parts of the wood, as a result of the preferred option for Baile Bhúirne/ Baile Mhic Íre APSR.

### 5.2.2. Special conservation interests potentially exposed to risk

- Oak woodland with holly and hard fern
- Alluvial forest with alder and ash (non-significant presence)

### 5.2.3. Ecological value of potentially affected features

Old "oak woodland with holly and hard fern" is the principal habitat on the site, and has been assessed as a good example of its type. The canopy is dominated by a mixture of birch *Betula* sp., beech *Fagus sylvatica*, ash *Fraxinus excelsior*, sessile oak *Quercus petraea*, and the occasional alder *Alnus glutinosa*, most of which are 10 - 14m high. The soil is described in the *Natura 2000* site data form as brown earth to brown podzolic, moist and relatively fertile over most of the area, but especially in the vicinity of the small stream near the south-eastern boundary. Seepage areas and rock outcrops occur, and small areas of "Alluvial forest with alder and ash" occur in damper areas, as indicated by the presence of alder, ash and willow *Salix* spp., but this habitat type is deemed to have a non-significant presence in the site and will not be assessed further.

The shrub, herb and ground layers contain a number of characteristic species of "oak woodland with holly and hard fern", namely: holly *Ilex aquifolium*, several ferns including hard fern *Blechnum spicant*, and a number of bryophytes.

### 5.2.4. Conservation objectives

The generic conservation objective for St. Gobnet's Wood SAC is:

- To maintain or restore the favourable conservation condition of the the Annex I habitat for which the SAC has been selected: [91A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles.<sup>25</sup>

#### 5.2.5. Condition of site and management

The *Natura 2000* Data Form (2000) describes the site as “partially degraded through the presence of exotic trees and an area of dense rhododendron *Rhododendron ponticum* and cherry laurel *Prunus laurocerasus*”. The NPWS Site Synopsis states that removal of rhododendron and some of the other exotic species from the woodland is ongoing, and the rehabilitation of the riverside woodland has also been successfully carried out. Regeneration of native species is poor, and future management may focus on the removal of invasive sycamore and beech.

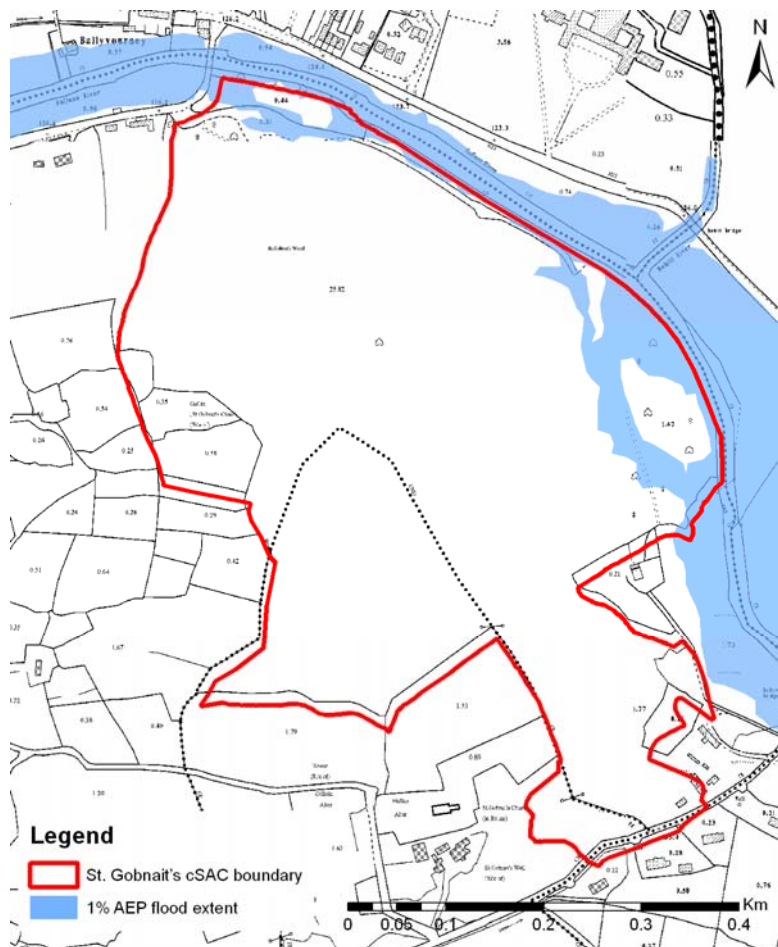
#### 5.2.6. Potential impact of scheme alone

St Gobnet’s Wood is currently in the floodplain as shown in Figure 5-1 and the proportion of the woodland currently at risk of flooding (under a 1% AEP<sup>26</sup> flood) is approximately 10% of the total wooded area.

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<sup>25</sup> NPWS (2011) *Conservation objectives for St. Gobnet's Wood SAC [000106]. Generic Version 3.0.* Department of Arts, Heritage & the Gaeltacht.

<sup>26</sup> AEP = Annual exceedance probability.



*Figure 5-1 Extent of flooding at St. Gobnet's Wood for a 1% AEP flood.*

The application of the preferred option in Baile Bhúirne/ Baile Mhic Íre APSR would involve the building of a new embankment along the left bank of the river channel in Baile Mhic Íre, towards the southern end of St. Gobnet's Wood SAC (which is on the right bank). Although the embankment would be outside the SAC, it would reduce floodplain storage along the left bank and result in a small increase in water levels upstream of Baile Bhúirne Bridge (<0.1m) and in the vicinity of the wood. There may, therefore, be a slight increase in flood risk to the wood as a result of this increase in water levels but there is unlikely to be an increase in the frequency of flooding of the wood as a result of proposed defences.

In principle, there is a risk to the interest features of St. Gobnet's Wood SAC as the potential for increased flooding of the lower parts of the wood could cause the composition of plant communities to change. However, an increase in water level of <0.1m is not likely to affect a significant area of the woodland, and published research suggests that the principal factor affecting tree species composition in floodplain woodlands appears to be flood duration – total

annual flood duration in the case of oak and ash<sup>27</sup>. The resilience of woodland in relation to flooding is demonstrated by their recognised role in flood alleviation. Research has demonstrated that the presence of trees and associated woody debris in floodplain woodland slows down flood flows and enhances flood storage<sup>28</sup>. As flood duration in the area of St. Gobnet's Wood is not expected to change as a result of the preferred option, it is considered that the preferred option is not likely to adversely affect the integrity of the site and its component features.

#### 5.2.7. Potential impact of scheme in-combination

A number of other plans and strategies were examined that could potentially affect the European Site in-combination with the Lee CFRMP, including the Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001 and Macroom Electoral Area Local Area Plan (LAP) Review. A potential opportunity was identified in the CFRMP to combine with road improvement works (N22 Ballincollig-Macroom-Baile Bhúirne) proposed in the Cork County Development Plan, but this is not expected to create any additional impacts. The CFRMP also takes account of predicted development and population changes identified in the Macroom LAP. Consequently, no significant adverse 'in-combination' effects were identified at the strategic level. The requirements of the draft South Western River Basin District Management Plan were integrated with the Lee CFRMP, through the Strategic Environmental Assessment (SEA) process, and a separate assessment of potential in-combination effects with this plan was not, therefore, considered necessary.

Nevertheless, any potential for in-combination effects at a local level, as a result of the design/nature of projects implemented through the CFRMP and the other plans, will be assessed in more detail as part of project specific Appropriate Assessments and Environmental Impact Assessment (EIA) processes, and the six yearly CFRMP review cycle, to ensure that any interactions do not arise that would adversely affect the integrity of St. Gobnet's Wood SAC.

#### 5.2.8. Measures to avoid adverse effects

The extent and frequency of past and potential future flooding of St. Gobnet's Wood should be examined at the project stage, with reference to a map of the wood showing the distribution of the SAC interest features, and in consultation with NPWS, in order to confirm whether further measures are required to avoid adverse effects. This should be supported by vegetation surveys, if necessary, to determine the distribution of the SAC special conservation interest features.

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<sup>27</sup> Vreugdenhaill, S.J., Kramer, K. & Pelsma, T. (2006) Effects of flooding duration, frequency and depth on the presence of spalings of six woody species in north-west Europe. *Forest Ecology and Management* 236 (1), 47-55.

<sup>28</sup> Thomas, H. & Nisbet, T. R. (2007) An assessment of the impact of floodplain woodland on flood flows. *Water and Environment Journal* 21 (2), 114-126.

A review of the plans listed in section 5.2.7 will be undertaken at the project stage as part of the project level Appropriate Assessment, in order to determine whether any in-combination effects are likely and whether further measures are required to avoid adverse effects.

### 5.3. The Gearagh SAC

#### 5.3.1. Potential risk to site resulting from CFRMP

Potential for a lowering of water levels in the Gearagh, as a result of implementation of the preferred option for the Lower Lee AU.

#### 5.3.2. Special conservation interests potentially exposed to risk

- Oak woodland with holly and hard fern
- Alluvial forest with alder and ash
- Plain and sub-mountainous rivers with floating water crowfoot vegetation
- Mammals (otter)

#### 5.3.3. Ecological value of potentially affected features

The Gearagh is a mixed deciduous riverine woodland<sup>29</sup> formed on the braided river channel of the River Lee, and comprising a series of wooded islands separated by a complex network of interlinking channels (2 to 6m wide). The area has probably been wooded throughout the post-glacial era and its character has been produced by frequent flooding. It represents the only extensive alluvial forest in Europe west of the Rhine, despite the fact that about half of the original area was destroyed 1954/55 for the creation of the reservoir, and the most natural remnants of the original forest exist upstream of Toon Bridge, at the western end of the site.

The *Natura 2000* Data Form describes “Alluvial forest with alder and ash” (a priority habitat under the Habitats Directive) as being the predominant woodland type, with “Oak woodland with holly and hard fern” as a secondary habitat. However, the description in the Site Synopsis suggests that the situation is complex, stating that “the islands in the Gearagh consist of rather dry alluvium, and support an almost closed canopy of pedunculate oak<sup>30</sup> *Quercus robur*, ash *Fraxinus excelsior* and birch *Betula* spp. The understorey is of hazel *Corylus avellana*, holly *Ilex aquifolium* and hawthorn *Crataegus monogyna*. Willows *Salix* spp. and alder *Alnus glutinosa* are largely confined to channel margins and waterlogged areas”.

<sup>29</sup> Emmerson, M. (No date) The Gearagh. <http://www.ucc.ie/staff/memmers/Gearagh.htm> (08/10/09)

<sup>30</sup> Note that this habitat type comprises a range of woodland types dominated by mixtures of oak (sessile oak *Quercus petraea* and/or pedunculate oak *Q. robur*) and birch (silver birch *Betula pendula* and/or downy birch *B. pubescens*).  
<http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H91A0> (08/10/09)

Information was not available on the riverine habitats and running water, except that the *Natura 2000* Data Form describes the aquatic riverine vegetation as being well-developed, and states that otters occur throughout the site.

#### 5.3.4. Conservation objectives

The generic conservation objective for The Gearagh SAC is:

- To maintain or restore the favourable conservation condition of the Annex I habitats and the Annex II species for which the SAC has been selected:
  - o [91A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles.
  - o [3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation;
  - o [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*).
  - o [1355] Otter *Lutra lutra*<sup>31</sup>

#### 5.3.5. Condition of site and management

According to the *Natura 2000* Data Form (1996) there are no major threats to this site, although damage to marginal areas from drainage attempts and grazing/poaching by cattle may occur in some areas, and illegal removal of timber may occur from time to time. The aquatic communities could be adversely affected by eutrophication. It is stated that the eastern part of the site has been flooded by a dam, and is subject to artificial fluctuations in water levels, but no mention is made of any effects of these water level fluctuations on the SAC features.

#### 5.3.6. Potential impact of scheme alone

The application of the preferred option in Lower Lee AU would involve a reduction in levels in both the Carrigadrohid and Inniscarra reservoirs prior to a flood event, and a possible maintenance of lower levels at certain times of year. This could lead to a lowering of water levels in the Gearagh and adversely affect the wetland habitats and species of the SAC, but there is uncertainty at present as to the likelihood, extent or effect of any water level changes. However, as the woodland habitats are located upstream of the reservoir<sup>32</sup> and are based on the braided channels and linked to fluvial water flows and natural floods, they are unlikely to be affected by any reductions in reservoir levels. Similarly, the riverine habitats and otters are principally linked to the fluvial areas.

The implementation of the preferred option for the Lower Lee AU may not, therefore, adversely affect the integrity of The Gearagh SAC and its component features.

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<sup>31</sup> NPWS (2011) *Conservation objectives for The Gearagh SAC [000108]. Generic Version 3.0.* Department of Arts, Heritage & the Gaeltacht.

<sup>32</sup> NPWS Site Synopsis for 000108 The Gearagh.



### 5.3.7. Potential impact of scheme in-combination

A number of other plans and strategies were examined that could potentially affect the European Site in-combination with the Lee CFRMP, including Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001, Macroom Electoral Area LAP Review and Macroom Town Development Plan. However, there are no significant proposals within the vicinity that could have a synergistic or additive effect with the CFRMP proposals for water level management in both the Carrigadrohid and Inniscarra reservoirs. Consequently, no significant adverse 'in-combination' effects were identified at the strategic level. The requirements of the draft South Western River Basin District Management Plan were integrated with the Lee CFRMP, through the SEA process, and a separate assessment of its potential in-combination effects was not, therefore, necessary.

Nevertheless, any potential for in-combination effects at a local level, as a result of the design/nature of projects implemented through the draft CFRMP and the other plans, will be assessed in more detail as part of project specific Appropriate Assessments and EIA processes, and the six yearly CFRMP review cycle, to ensure that any interactions do not arise that would adversely affect the integrity of The Gearagh SAC.

### 5.3.8. Measures to avoid adverse effects

At the project stage, the current management regime of the reservoir and the SAC will be investigated and modelling undertaken of present and future water level changes in relation to maps of habitat distribution, if available. Surveys will also be undertaken, if necessary, and data reviewed on the impact of managing other similar reservoirs. This information will then be used to determine the likelihood of an adverse effect and, if necessary, identify suitable mitigation measures in consultation with NPWS.

A review of the plans listed in Section 5.3.7 will be undertaken at the project stage as part of the project level Appropriate Assessment, in order to re-assess whether any in-combination effects are likely and whether further measures are required to avoid adverse effects.

## 5.4. The Gearagh SPA

### 5.4.1. Potential risk to site resulting from CFRMP

Potential for a lowering of water levels in the Gearagh, as a result of implementation of the preferred option for the Lower Lee AU.

### 5.4.2. Special conservation interests potentially exposed to risk

- Regularly occurring migratory birds listed in Annex 1 of Council Directive 2009/147/EC
- Wetland

### 5.4.3. Ecological value of potentially affected features

The wintering waterfowl assemblage of the Gearagh is of international importance and includes swans, dabbling duck, diving duck and waders. The four species listed have populations of national importance (all figures are average peaks for the 5 winters 1995/96-1999/00): wigeon (1,080), teal (1,194), mallard (584) and coot (308).

The principal habitats for waterfowl are a shallow lake between Annahala Bridge and Lee Bridge, which is continuous with the Carrigadrohid reservoir, and fringing wet woodland and grassland that are prone to flooding. Waterfowl graze, forage and roost on these grasslands, as well as the muddy fringes of the lake which vary in extent depending on water levels in the reservoir. Habitat quality is reported as good.

#### 5.4.4. Conservation objectives

The draft main conservation objective for The Gearagh SPA is:

- To maintain the special conservation interests for this SPA at favourable conservation status: wetland and waterbirds.

#### 5.4.5. Condition of site and management

According to the *Natura 2000* Data Form (2004) there are no imminent threats to the wintering bird populations as the site is a nature reserve, although some disturbance is caused to the birds by illegal shooting. Although it is stated that the habitats fringing the lake (reservoir) are prone to flooding, and that mudflats appear at times of low water, no mention is made of any effects of these water level fluctuations on the SPA bird populations.

#### 5.4.6. Potential impact of scheme alone

The application of the preferred option in the Lower Lee AU would involve a reduction in levels in both the Carrigadrohid and Inniscarra reservoirs prior to a flood event, and a possible maintenance of lower levels at certain times of year. This could lead to a lowering of water levels in the Gearagh and adversely affect the SPA species and their habitats, but there is uncertainty at present as to the likelihood, extent or effect of any water level changes beyond the current range. It is likely that the SPA bird community benefit from, or exploit, the current water level fluctuations in that periodic lowering of water levels exposes food resources in the mud and shallow water that are otherwise inaccessible to all but the relatively few diving ducks that occur.

Considering that the waterbird community and its habitats are already adjusted or adapted to unpredictably fluctuating water levels, the implementation of the preferred option for the Lower Lee AU may not adversely affect the integrity of The Gearagh SPA and its component features, provided that water levels do not vary beyond the current range.

#### 5.4.7. Potential impact of scheme in-combination

A number of other plans and strategies were examined that could potentially affect the European Site in-combination with the Lee CFRMP, including Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001, Macroom Electoral Area LAP Plan Review and Macroom Town Development Plan. However, there are no significant proposals within the vicinity that could have a synergistic or additive effect with the CFRMP proposals for water level management in both the Carrigadrohid and Inniscarra reservoirs. Consequently, no significant adverse 'in-combination' effects were identified at the strategic level. The requirements of the draft South Western River Basin District Management Plan were integrated with the Lee CFRMP, through the SEA process, and a separate assessment of its potential in-combination effects was not, therefore, necessary.

Nevertheless, any potential for in-combination effects at a local level, as a result of the design/nature of projects implemented through the draft CFRMP and the other plans, will be

assessed as part of project specific Appropriate Assessments and EIA processes, and the six yearly CFRMP review cycle, to ensure that any interactions do not adversely affect the integrity of The Gearagh SPA.

#### 5.4.8. Measures to avoid adverse effects

In advance of the project stage, Irish Wetland Bird Survey data for the Gearagh will be obtained from BirdWatch Ireland/ NPWS and, if necessary, targeted surveys will be undertaken to determine the distribution of birds in the reservoir.

At the project stage, the current management regime of the reservoir and the SPA will be investigated and modelling undertaken of present and future water level changes in relation to maps of habitat and bird distribution. Data on the impact of managing other similar reservoirs will also be reviewed. This information will then be used to determine the likelihood of an adverse effect and, if necessary, identify suitable mitigation measures in consultation with NPWS.

A review of the plans listed in Section 5.4.7 will be undertaken at the project stage as part of the project level Appropriate Assessment, in order to re-assess whether any in-combination effects are likely and whether further measures are required to avoid adverse effects.

### 5.5. Cork Harbour SPA

#### 5.5.1. Potential risk to site resulting from CFRMP

During construction of the preferred options for Carrigaline APSR, Midleton APSR and Little Island APSR there is a potential for temporary damage to intertidal habitats, and disturbance to bird populations. In the long term, there is a potential for habitat loss as a result of coastal squeeze.

#### 5.5.2. Special conservation interests potentially exposed to risk

- Birds listed in Annex 1 of Directive 2009/147/EC
- Other regularly occurring migratory birds
- Wetland

#### 5.5.3. Ecological value of potentially affected features

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country. The five-year average annual waterfowl count for the entire harbour complex was 50,786 for the period 1999/2000-2003/04, and the peak count<sup>33</sup> was 72,366. Of particular note is that the site supports an internationally important population of Redshank, and a further 15 species have populations of national importance.

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<sup>33</sup> The sum of the peaks for each species.

The ecological value of each of the areas of the SPA that are potentially affected by the CFRMP is summarised below. It is also possible that a proportion of the bird populations use terrestrial habitats adjacent to the estuary but outside the SPA boundary, especially at high tide, but the extent of this is not known.

- *Owenboy estuary* (Carrigaline APSR). The upper reaches of the Owenboy estuary (upstream of the narrow channel) are where the majority of the wintering waterfowl occur, and it is here that proposed works would be located. Mean and peak counts of wintering waterfowl in the estuary for the period 1999/2000 – 2003/04 were 1,482 and 2,094 respectively<sup>34</sup>, representing, in both cases, 2.9% of the total for the whole of Cork harbour. This is a significant proportion of the harbour population, following the widely accepted “1% rule”<sup>35</sup>. The most numerous species, according to the NPWS site synopsis, are dunlin, redshank and curlew, although Cork Harbour Bird Atlas<sup>36</sup> maps indicate that it is also of some importance for golden plover, mallard and shelduck. The bird habitats exposed at low tide in this part of the estuary are almost entirely intertidal mudflats, which provide an important foraging site. A narrow channel runs along the south side of the estuary at low tide, and a very small area of saltmarsh is located to the east of the proposed works site.
- *Ballynacorra River* (Midleton APSR). The Ballynacorra River is the estuary of the Owennacurra River and forms a north-eastern spur of Cork Harbour. The proposed works for Midleton APSR would be located on the eastern bank of the upper reaches of this estuary. Mean and peak counts of wintering waterfowl in the estuary for the period 1999/2000 – 2003/04 were 533 and 791 respectively, representing, in each case, 1% of the total for the whole of Cork harbour. This is a significant proportion of the harbour population, following the widely accepted “1% rule”. The Cork Harbour Bird Atlas maps indicate that the Ballynacorra estuary is particularly important for lapwings and teal.
- *Dunkettle* (Little Island APSR). The Dunkettle area of Cork harbour is in the north-western corner, at the confluence of the Lee and Glashaboy Rivers. Mean and peak counts of wintering waterfowl in the count area for the period 1999/2000 – 2003/04 were 4510 and 7491 respectively, representing 8.9% and 10.4% of the total for the whole of Cork harbour. This is a very significant proportion of the harbour population, following the widely accepted “1% rule”, despite covering a relatively small area of the harbour. Relatively high densities of seven species occur here - bar-tailed godwits, cormorants, curlew, dunlin, golden plover, lapwing and oystercatcher.

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<sup>34</sup> Data from Cork Harbour Bird Atlas <http://corkharbourbirds.ucc.ie/> (08/10/09)

<sup>35</sup> This is an arbitrary threshold that was developed under the Ramsar Convention, so that a wetland is considered important in a national (e.g. Great Britain or all-Ireland) context if it regularly holds 1% or more of one waterbird species, sub-species or population (in Great Britain or the island of Ireland respectively), and of international importance if it regularly supports the same proportion of the relevant international population. Normally this is measured by calculating the five-year peak mean for each species and expressing this as a percentage of the national/international population estimates. It is often been extended, as in this case, to assess the importance of individual sites or local populations within a wetland.

<sup>36</sup> Cork Harbour Bird Atlas, *Op.cit.*

#### 5.5.4. Conservation objectives

The generic conservation objective<sup>37</sup> for Cork Harbour SPA is:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:
  - o Golden plover, Bar-tailed godwit, Common tern, Little grebe, Great crested grebe, Cormorant, Grey heron, Shelduck, Wigeon, Teal, Pintail, Shoveler, Goosander, Oystercatcher, Grey plover, Lapwing, Dunlin, Black-tailed godwit, Curlew, Redshank, Black-headed gull, Common gull, Lesser black-backed gull.

#### 5.5.5. Condition of site and management

According to the *Natura 2000* Data Form (2003), there are no serious imminent threats to the wintering birds of Cork Harbour SPA. However, it reported that recreational activities are high in some areas, including jet skiing which causes disturbance to roosting birds. General and potential threats come from: aquatic pollution (although there are no apparent significant ecological impacts at present); oil pollution as a result of shipping; and land claim for industrial, port-related and road projects.

#### 5.5.6. Potential impact of scheme alone

1. *Carrigaline APSR*. The application of the preferred option in Carrigaline APSR would involve the location of flood walls along the SPA boundary in the Owenboy estuary. Construction of defences on the south bank of the estuary, downstream of the eastern bridge would comprise:
  - o c.400m of flood wall constructed above the high tide level
  - o c.360m of flood wall replacing an existing wall running alongside the road.

During construction of both these walls, there is likely to be some disturbances to intertidal habitats along the alignment of the defence as a result of excavation for foundations, temporary works, etc. The footprint of the works is estimated to be no more than 10-20m in width along the alignment of the defences. Once constructed, the walls are not expected to affect the intertidal habitat over and above what is already in place. In the long term, however, the maintenance of the existing line of defence may lead to habitat loss as a result of coastal squeeze.

The intertidal area here is very narrow, confined between the low water channel and the current defences, and is unlikely to be used by more than a few foraging birds. However, there is potential for temporary disturbance to bird populations using the wider mudflat areas, as a result of noise and activity associated with the works. Considering that SPA bird populations use this part of the Owenboy River estuary in significant numbers, this could result in a significant adverse effect. Nevertheless,

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<sup>37</sup> NPWS (2011) *Conservation objectives for Cork Harbour SPA [004030]. Generic Version 4.0.* Department of Arts, Heritage & the Gaeltacht. (Accessed 25/03/2013, at 13:00)

given the presence of the Crosshaven Road running close to the estuary shore, and the evident habituation of the bird populations in this part of the estuary to current activity and noise levels associated with the road, their response to additional activity may be limited. A study by IECS (2007)<sup>38</sup> on the Humber estuary in England concluded that birds become habituated to regular construction noise below 70dB. Consequently, it is not clear that the proposed construction activities will represent a significant increase in noise and activity levels in relation to the present conditions which are tolerated by the estuary birds. It is very likely that birds will be displaced from the immediate vicinity of the active construction sites as a result of personnel and plant on the bank, but the effects on more distant birds are more difficult to assess. However, the birds may become habituated to the new activity within a number of days thus reducing the magnitude of the effect.

It is recommended that mitigation measures should be implemented to ensure that potential disturbance to SPA bird populations is reduced to a minimum. It is recommended that the works are undertaken, as far as possible, between April and August to avoid the main migration and wintering period, and that any piling work is undertaken using a non-percussive piling technique to reduce noise levels. Provided that these mitigation measures are implemented, the application of the preferred option for the Carrigaline APSR may not adversely affect the integrity of the SPA and its constituent features.

2. *Midleton APSR*. The application of the preferred option for Midleton APSR would involve the construction of flood walls/embankments along the eastern bank of the Owennacurra/Ballynacorra estuary, in south Midleton, and within the boundaries of the Cork Harbour SPA. However, the works would be restricted to the eastern margin of the estuary and are only likely to directly impact on intertidal habitats along a narrow strip of mudflat between the main channel and Bailick Road. Although the proposed defences would replace existing ones, temporary damage to the intertidal habitats are likely, during construction, along a 10-20m wide strip. The works would have the potential to cause temporary disturbance to bird populations in this part of the estuary but there is unlikely to be a significant impact on their habitats in the short term. In the long term, however, the maintenance of the existing line of defence may lead to habitat loss as a result of coastal squeeze.

However, provided that the same mitigation measures are implemented as in the case of Carrigaline APSR, the application of the preferred option for the Midleton APSR may not adversely affect the integrity of the SPA and its constituent features.

3. *Little Island APSR*. The application of the preferred option for Little Island APSR would involve the improvement of a sluice beneath the N25 motorway. The sluice is over 300m from the boundary of the SPA, and the works would be screened from the main intertidal habitats and birds and by embankments and motorway access

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<sup>38</sup> IECS (2007) *Avifaunal disturbance assessment: flood defence works*. Institute of Estuarine and Coastal Studies, University of Hull. Report to the Environment Agency.

roads<sup>39</sup>. In addition, the baseline level of noise from the motorway and nearby industrial site at Inchera is likely to be such that noise from the works will not have any effect on the birds. It is, therefore, concluded that the preferred option for Little Island APSR will not adversely affect the integrity of the SPA and its constituent features.

#### 5.5.7. Potential impact of scheme in-combination

A number of other plans and strategies were examined that could potentially affect the European Site in-combination with the Lee CFRMP, including Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001, Cork City Development Plan 2009-2015, South Docks LAP, Carrigaline Electoral Area LAP Review 2010-2020, Middleton Electoral Area LAP Review and Blarney Electoral Area LAP Review 2010-2020. This review has revealed that Carrigaline and Middleton have been designated as 'Developing Areas', and both towns will receive a degree of priority for future infrastructure development. This is likely to stimulate further growth in these areas, which could increase pressure on the SPA bird populations, particularly as a result of disturbance. The potential for further development in the Little Island area has also been identified as a result of both the plans reviewed and the flood protection measures proposed by the CFRMP. Consequently, there is potential for significant adverse 'in-combination' effects. The requirements of the draft South Western River Basin District Management Plan were integrated with the Lee CFRMP, through the SEA process, and a separate assessment of potential in-combination effects was not, therefore, necessary.

The potential for in-combination effects at a local level, as a result of the design/nature of projects implemented through the draft CFRMP and the other plans, will be further assessed as part of project specific Appropriate Assessments and EIA processes, and the six yearly CFRMP review cycle, to ensure that any interactions do not adversely affect the integrity of Cork Harbour SPA.

#### 5.5.8. Measures to avoid adverse effects

The works should be undertaken, as far as possible, between April and August to avoid the main migration and wintering period, and any piling work should be undertaken using a non-percussive piling technique to reduce noise levels.

Irish Wetland Bird Survey data for the estuaries will be obtained from BirdWatch Ireland/NPWS in advance of the project stage and, if necessary, targeted surveys will be undertaken to determine the distribution of birds in the estuaries in relation to the location of the works. The information obtained will inform a more detailed assessment of the likelihood of an adverse effect and the need for any further measures, to be undertaken in consultation with NPWS.

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<sup>39</sup> There is a small area of mudflat in front of the sluice, but it is surrounded by embankments and roads, and, at most, only a few individual birds are likely to use the site.



A review of the plans listed in section 5.5.7 will be undertaken at the project stage as part of the project level Appropriate Assessment, in order to re-assess whether any in-combination effects are likely and whether further measures are required to avoid adverse effects.

The potential for intertidal habitat creation on the estuaries should be investigated in order to replace habitat likely to be lost through coastal squeeze.

## 5.6. Great Island Channel SAC

### 5.6.1. Potential risk to site resulting from CFRMP

*Midleton APSR* and *Little Island APSR* – potential encroachment on intertidal habitats of the SAC, and potential temporary disturbance to bird populations using the habitats. In the long term, there is potential for habitat loss as a result of coastal squeeze.

### 5.6.2. Special conservation interests potentially exposed to risk

- Mudflats and sandflats not covered by sea water at low tide;
- Atlantic salt meadows;
- Estuaries (non-significant presence);
- Cord-grass swards (non-significant presence).

### 5.6.3. Ecological value of potentially affected features

The ecological value of each of the areas of the SAC that are potentially affected by the CFRMP is summarised below: It is also possible that a proportion of the bird populations use terrestrial habitats adjacent to the estuary but outside the SAC boundary, especially at high tide, but the extent of this is not known.

- *Ballynacorra River* (Midleton APSR). The Ballynacorra River is the estuary of the Owennacurra River and forms a north-eastern spur of Cork Harbour. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel. The estuarine area is occupied principally by mudflats at low tide, but saltmarshes are extensive in the northern section north of the N25 motorway.
- *Little Island* (Little Island APSR). The part of the SAC that is within the APSR is the western edge between Glounthaune and Carrigrenan Point/Harbour Point Cork. Mudflats are extensive at the northern (Glounthaune) end and on the other side of the subtidal channel between Foaty and Marino Point, but only narrow intertidal mudflats extend along the rest of Little Island. Only small patches of saltmarsh exist in this part of the SAC.

#### 5.6.4. Conservation objectives

The generic conservation objective<sup>40</sup> for Great Island Channel SAC is:

- To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected:
  - o [1140] Mudflats and sandflats not covered by seawater at low tide
  - o [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

#### 5.6.5. Condition of site and management

According to the *Natura 2000* Data Form (2000), the greatest threats to the site's conservation significance come from road works, infilling, sewage outflows and possible marina developments. The site receives polluted waters from agricultural, domestic and industrial sources, although surveys indicate that pollution levels in the water and sediments are not excessive, and the site appears to have a normal macro-invertebrate fauna. The Midleton sewage outfall was relocated to a more favourable location in the early 1990s. Cord grass *Spartina* is well established and may have caused some alterations to the intertidal and salt marsh habitats.

#### 5.6.6. Potential impact of scheme alone

**Midleton APSR.** The application of the preferred option in Midleton APSR would involve the construction of flood walls/embankments along the eastern bank of the Owennacurra/Ballynacorra estuary, in south Midleton, and within the boundaries of the Great Island Channel SAC. However, the works would be restricted to the eastern margin of the estuary and are only likely to directly impact on intertidal habitats along a narrow strip of mudflat between the main channel and Bailick Road. Although the proposed defences would replace existing ones, temporary damage to the intertidal habitats are likely, during construction, along a 10-20m wide strip. In the long term, however, the maintenance of the existing line of defence may lead to habitat loss as a result of coastal squeeze.

The application of the preferred option for the Midleton APSR may not adversely affect the integrity of the SAC and its constituent features in the short to medium term. In the long term, however, coastal squeeze may adversely affect the SAC.

**Little Island APSR.** Although the Little Island APSR is partially within the Great Island Channel SAC, this does not include the western side where the proposed works would be located. The proposed works site is approximately 3.6km upstream of the SAC boundary and the effects of the works will be very localised. It is, therefore, concluded that the preferred option for Little Island APSR will not adversely affect the integrity of the SAC and its component features.

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<sup>40</sup> NPWS (2011) *Conservation objectives for Great Island Channel SAC [001058]. Generic Version 3.0.* Department of Arts, Heritage & the Gaeltacht.

#### 5.6.7. Potential impact of scheme in-combination

A number of other plans and strategies were examined that could potentially affect the European Site in-combination with the Lee CFRMP, including Cork County Development Plan 2009-2015, Cork Area Strategic Plan (CASP) 2001 and the Midleton Electoral Area LAP Review. This review has revealed that Midleton has been designated as a 'Developing Area', and the town will receive a degree of priority for future infrastructure development. This is likely to stimulate further growth in this area, and the potential for further development in the Little Island area has also been identified as a result of both the plans reviewed and the flood protection measures proposed by the CFRMP. However, no significant adverse 'in-combination' effects on the SAC were identified at the strategic level. The requirements of the draft South Western River Basin District Management Plan and a number of sectoral plans and strategies were integrated with the Lee CFRMP, through the SEA process, and a separate assessment of potential in-combination effects was not, therefore, necessary.

Nevertheless, any potential for in-combination effects at a local level, as a result of the design/nature of projects implemented through the CFRMP and the other plans, will be assessed as part of project specific Appropriate Assessments and EIA processes, and the six yearly CFRMP review cycle, to ensure that any interactions do not adversely affect the integrity of Great Island Channel SAC.

#### 5.6.8. Measures to avoid adverse effects

The potential for intertidal habitat creation on the estuary will be investigated in order to replace habitat likely to be lost through coastal squeeze.

A review of the plans listed in section 5.6.7 will be undertaken at the project stage as part of the project level Appropriate Assessment, in order to re-assess whether any in-combination effects are likely and whether further measures are required to avoid adverse effects.

### 5.7. Summary and Conclusion

This appropriate assessment has been carried out considering the likely effects of the implementation of the preferred options identified in the Lee CFRMP, alone and in-combination, on the integrity of five *Natura 2000* or European sites: St. Gobnet's Wood SAC, The Gearagh SAC, The Gearagh SPA, Cork Harbour SPA and Great Island Channel SAC. The special conservation interests and conservation objectives of the seven sites under consideration are as published on the NPWS website, 25/03/2013, unless otherwise stated.

Table 5-2 summarises the results of the appropriate assessment, and it is concluded that:

- The implementation of the Lee CFRMP may not, alone, adversely affect the integrity of St. Gobnet's Wood SAC, but modelling and possible survey at the project stage will confirm this or indicate measures to avoid adverse effects. Implementation of any necessary measures, and recognition of the site as a constraint, would ensure that the Plan has no adverse effect on the integrity of the SAC.
- The implementation of the Lee CFRMP may not, alone, adversely affect the integrity of The Gearagh SAC and SPA, but modelling and possible survey at the project stage will confirm this or indicate measures to avoid adverse effects. Implementation of any necessary measures, and recognition of the sites as a constraint, would ensure that the Plan has no adverse effect on the integrity of the SAC and SPA.

- Provided that mitigation measures are implemented in relation to the application of the preferred options for Carrigaline APSR and Midleton APSR, the CFRMP will not, alone, adversely affect the integrity of the Cork Harbour SPA and Great Island Channel SAC. The mitigation measures concern the collection of data on bird distribution; timing of the proposed works to avoid the main bird migration and wintering season; and the reduction of noise levels by using, for example, non-percussive piling techniques.
- The implementation of the Lee CFRMP may, in the long term, lead to some habitat loss in Cork Harbour SPA and Great Island Channel SAC, as a result of coastal squeeze caused by sea level rise and the maintenance of the existing line of defence. However, within the area of Cork Harbour SPA and Great Island Channel SAC, the CFRMP only identifies flood risk management interventions for the following local areas: Dunkettle and the upper reaches of the Owenboy and Ballynacorra estuaries. At these locations, there is a limited amount of foreshore and, although the defences will be set back from the estuary habitats as much as possible, they are very constrained to landward by existing roads and buildings. However, the total length of defences involved is only approximately 2km, representing less than an estimated 2% of the combined SPA and SAC shore. It is therefore proposed that at the strategic level there is no adverse impact on Cork Harbour SPA and Great Island Channel SAC represented by coastal squeeze in these areas, BUT the nature and size of the local impact needs to be assessed at the scheme or project development stage when the required mitigation or compensation can be investigated.
- The implementation of the Lee CFRMP has the potential to adversely affect the integrity of Cork Harbour SPA in-combination with other plans and projects, and there may also be the potential for such impacts on other European sites depending on the design/nature of projects implemented through the CFRMP and the other plans. However, the nature and size of the local impact will be assessed at the scheme or project development stage when the required mitigation or compensation can be investigated, and the project specific Habitats Directive assessment and EIA process, and the six yearly CFRMP review cycle, will ensure that any interactions do not adversely affect the integrity of the *Natura 2000* sites.

Integral to the CFRMP's scheme or project designs will be measures to avoid or minimise potentially negative environmental impacts. Individual schemes or projects will be designed to incorporate standard and specific mitigation measures, and the construction phase will follow good site practices, with the aim of ensuring that there are no adverse effects on the integrity of the *Natura 2000* sites, following ongoing discussions with NPWS. These measures will be described in the individual scheme or project specific Appropriate Assessments.

Table 5-2: Summary of the appropriate assessment of the potential effects of the proposed Lee CFRMP on Natura 2000 sites in the catchment

| Special conservation interests and potential issues (not including features with a non-significant presence)                                                        | Conservation objectives                                                                                                                                                                                                                                                                                                                    | Contribution of feature to ecological structure and function of site                                                                                                                                                                                                   | Contribution of management or unauthorised sources to feature and/or the feature condition                                                                                                                                                                                                                                                                                                                                                   | Adverse effect of proposal alone and in-combination on feature and/or site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Can adverse effects be avoided?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Adverse effect on integrity?                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <b>St. Gobnet's Wood SAC:</b> <i>Baile Bhúirne/ Baile Mhic Íre</i> APSR, Preferred Option: Permanent flood walls and/or embankments in Baile Mhic Íre.              |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>Oak woodland with holly and hard fern</li> </ul> <p>Potential issues: increased flooding of the lower parts of the wood.</p> | <p>The generic conservation objective for St. Gobnet's Wood SAC is:</p> <ul style="list-style-type: none"> <li>To maintain or restore the favourable conservation condition of the Annex I habitat for which the SAC has been selected: 91A0 - Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles.</li> </ul> | <p>Old "oak woodland with holly and hard fern" is the principal habitat on the site, and has been assessed as a good example of its type. The shrub, herb and ground layers contain a number of characteristic species of "oak woodland with holly and hard fern".</p> | <p>The site is "partially degraded through the presence of exotic trees and an area of dense rhododendron and cherry laurel". Removal of rhododendron and some of the other exotic species from the woodland is ongoing, and the rehabilitation of the riverside woodland has also been successfully carried out. Regeneration of native species is poor, and future management may focus on the removal of invasive sycamore and beech.</p> | <p><b>Alone</b><br/>Building a new embankment along the left bank of the river channel would reduce floodplain storage along the left bank and result in a small increase in water levels in the vicinity of the wood.</p> <p>Approximately 10% of the wood is currently at risk of flooding, and there may be a slight increase in flood risk as a result of an increase in water levels. There is unlikely to be an increase in the frequency of flooding.</p> <p>In principal, the potential for increased flooding of the lower parts of the wood could cause the composition of plant communities to change. However, an increase in water level of &lt;1m is not likely to affect a significant area of the woodland, and the principal factor affecting tree species composition in floodplain woodlands is flood duration. As flood duration in the area of St. Gobnet's Wood is not expected to change as a result of the preferred option, it is considered that it may not have a significant ecological effect.</p> <p><b>In-combination</b><br/>No significant adverse 'in-combination' effects were identified at the 'strategic level, although there is potential for such impacts at a local level depending on the design/nature of projects implemented through the CFRMP and the other plans.</p> | <p><b>Alone – Yes</b><br/>No adverse effects are expected from the scheme alone, but modelling and possible survey at project stage will confirm this or indicate measures to avoid adverse effects.</p> <p><b>In-combination - Yes</b><br/>A review of other plans will be undertaken at the project stage as part of the project level Appropriate Assessment. This project specific Appropriate Assessment and EIA process, and the six yearly CFRMP review cycle, will ensure that the interactions do not adversely affect the integrity of</p> | <p><b>Alone – No</b><br/>It is unlikely that an adverse effect on the integrity of the St. Gobnet's Wood SAC will occur as a result of the scheme alone.</p> <p><b>In-combination – No</b><br/>It is unlikely that there will be an in-combination adverse effect on the integrity of St. Gobnet's Wood SAC.</p> <p>The CFRMP recognises St. Gobnet's Wood SAC as a constraint in the scheme design and this will be taken forward to the project stage to avoid adverse</p> |

| Special conservation interests and potential issues (not including features with a non-significant presence)                                                                                                                                                                                                   | Conservation objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Contribution of feature to ecological structure and function of site                                                                                                                                                                                                                                                                                                                                              | Contribution of management or unauthorised sources to feature and/or the feature condition                                                                                                                                                                                                                                                                                                                                                  | Adverse effect of proposal alone and in-combination on feature and/or site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Can adverse effects be avoided?                                                                                                                                                                                                                                                                                                                                                                                       | Adverse effect on integrity?                                                                                                                                                                                                                                                                                                                                    |
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| <b>The Gearagh SAC:</b> Lower Lee AU, Preferred Option: Operation of Carrigadrohid and Inniscarra Dams to further optimise flood risk management potential, informed by integrated flood forecasting.                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>Alluvial forest with alder and ash</li> <li>Plain and submountainous rivers with floating water crowfoot vegetation</li> <li>Oak woodland with holly and hard fern</li> <li>Mammals (otter)</li> </ul> <p>Potential issue: lowering of water levels in the Gearagh.</p> | <p>The generic conservation objective for The Gearagh SAC is to maintain or restore the favourable conservation condition of the Annex I habitats and the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>[91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles.</li> <li>[3260] Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation;</li> <li>[91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion</li> </ul> | <p>The character of the area has been produced by frequent flooding. The most natural forest remnants exist at the western end of the site. The islands in the river consist of rather dry alluvium, and support an almost closed canopy of pedunculate oak, ash and birch. The understorey is of hazel, holly and hawthorn. Willows and alder are largely confined to channel margins and waterlogged areas.</p> | <p>There are no major threats to this site, although damage to marginal areas from drainage attempts and grazing/poaching by cattle may occur in some areas, and illegal removal of timber may occur from time to time. The aquatic communities could be adversely affected by eutrophication. It is stated that the eastern part of the site has been flooded by a dam, and is subject to artificial fluctuations in water levels, but</p> | <p><b>Alone</b><br/>The preferred option would involve a reduction in levels in the Carrigadrohid and Inniscarra reservoirs prior to a flood event, and a possible maintenance of lower levels at certain times of year. This could lead to a lowering of water levels in the Gearagh and adversely affect the wetland habitats and species of the SAC, but there is uncertainty at present as to the likelihood, extent or effect of any water level changes.</p> <p>However, as the woodland habitats are located upstream of the reservoir, and linked to fluvial water flows and natural floods, they are unlikely to be affected by any reductions in reservoir levels. Similarly, the riverine habitats and otters are principally linked to the fluvial areas.</p> <p><b>In-combination</b><br/>No significant adverse 'in-combination' effects were identified at the 'strategic level, although there is potential for such impacts at a local level depending on the design/nature of actions implemented through the CFRMP and the other</p> | <p><b>Alone – Yes</b><br/>No adverse effects are expected from the scheme alone, but modelling and possible survey at project stage will confirm this or indicate measures to avoid adverse effects.</p> <p><b>In-combination - Yes</b><br/>A review of other plans will be undertaken at the project stage as part of the project level Appropriate Assessment. This project specific Appropriate Assessment and</p> | <p><b>Alone – No</b><br/>It is unlikely that an adverse effect on the integrity of The Gearagh SAC will occur as a result of the scheme alone.</p> <p><b>In-combination – No</b><br/>It is unlikely that there will be an adverse in-combination effect on the integrity of The Gearagh SAC.</p> <p>The CFRMP recognises The Gearagh SAC as a constraint in</p> |

| Special conservation interests and potential issues (not including features with a non-significant presence)                                                                                                  | Conservation objectives                                                                                                                                                                                   | Contribution of feature to ecological structure and function of site                                                                                                                                                                                           | Contribution of management or unauthorised sources to feature and/or the feature condition                                                                                                                                                                                          | Adverse effect of proposal alone and in-combination on feature and/or site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Can adverse effects be avoided?                                                                                                                                                                                                                                         | Adverse effect on integrity?                                                                                                                                                                                                                |
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|                                                                                                                                                                                                               | albae).<br>• [1355] Otter <i>Lutra lutra</i> <sup>41</sup>                                                                                                                                                | Aquatic riverine vegetation well-developed. Otters occur throughout the site.                                                                                                                                                                                  | no mention is made of any effects of these water level fluctuations on the SAC features.                                                                                                                                                                                            | plans.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | EIA process, and the six yearly CFRMP review cycle, will ensure that the interactions do not adversely affect the integrity of The Gearagh SAC.                                                                                                                         | the scheme design and this will be taken forward to the project stage to avoid adverse effects.                                                                                                                                             |
| <b>The Gearagh SPA:</b> <i>Lower Lee AU</i> , Preferred Option: Operation of Carrigadrohid and Inniscarra Dams to further optimise flood risk management potential, informed by integrated flood forecasting. |                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>Regularly occurring migratory species: Wigeon, Teal, Mallard, Coot</li> <li>Wetland</li> </ul> Potential issues: lowering of water levels in the Gearagh.              | Draft conservation objective:<br><ul style="list-style-type: none"> <li>To maintain the special conservation interests for this SPA at favourable conservation status: wetland and waterbirds.</li> </ul> | The principal habitats for waterfowl are a shallow lake between Annahala Bridge and Lee Bridge, which is continuous with the Carrigadrohid reservoir, and fringing wet woodland and grassland that are prone to flooding. Waterfowl graze, forage and roost on | There are no imminent threats to the wintering bird populations as the site is a nature reserve, although some disturbance is caused to the birds by illegal shooting. The habitats fringing the lake (reservoir) are prone to flooding, and mudflats appear at times of low water. | <b>Alone</b><br>The preferred option would involve a reduction in levels in the Carrigadrohid and Inniscarra reservoirs prior to a flood event, and possible maintenance of lower levels at certain times of year. This could lead to lowering of water levels in the Gearagh and adversely affect SPA species and their habitats, but there is uncertainty at present as to the likelihood, extent or effect of any water level changes beyond the current range.<br><br>It is likely that the SPA bird community benefit from, or exploit, the current water level fluctuations in that periodic lowering of water levels exposes food resources in the mud and shallow water that are otherwise inaccessible to all but the relatively | <b>Alone – Yes</b><br>No adverse effects are expected from the scheme alone, but modelling, data analysis and possible survey at project stage will confirm this or indicate measures to avoid adverse effects.<br><br><b>In-combination - Yes</b><br>A review of other | <b>Alone – No</b><br>It is unlikely that an adverse effect on the integrity of The Gearagh SPA will occur as a result of the scheme alone.<br><br><b>In-combination – No</b><br>It is unlikely that there will be an adverse in-combination |

<sup>41</sup> NPWS (2011) *Conservation objectives for The Gearagh SAC [000108]. Generic Version 3.0.* Department of Arts, Heritage & the Gaeltacht.



| Special conservation interests and potential issues (not including features with a non-significant presence)                                                                                                                                                                                                                                      | Conservation objectives                                                                                                                                                                            | Contribution of feature to ecological structure and function of site                                                                                                                                                                                                                                                                                  | Contribution of management or unauthorised sources to feature and/or the feature condition                                                                                                                                                                                       | Adverse effect of proposal alone and in-combination on feature and/or site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Can adverse effects be avoided?                                                                                                                                                                                                                                                                    | Adverse effect on integrity?                                                                                                                                                                                                                               |
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|                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                    | these grasslands, as well as the muddy fringes of the lake which vary in extent depending on water levels in the reservoir.                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                  | few diving ducks that occur. Considering that the water bird community and its habitats are already adjusted or adapted to unpredictably fluctuating water levels, there may not be a significant ecological effect, provided that water levels do not vary beyond the current range.<br><br><b>In-combination</b><br>No significant adverse 'in-combination' effects were identified at the strategic level, although there is potential for such impacts at a local level depending on the design/nature of actions implemented through the CFRMP and the other plans.                                                                                                                                                                                                                | plans will be undertaken at the project stage as part of the project level Appropriate Assessment. The project specific Appropriate Assessment and EIA process, and the six yearly CFRMP review cycle, will ensure that the interactions do not adversely affect the integrity of the Gearagh SPA. | effect on the integrity of The Gearagh SPA.<br><br>The CFRMP recognises The Gearagh SPA as a constraint in the scheme design and this will be taken forward to the project stage to avoid adverse effects.                                                 |
| <b>Cork Harbour SPA:</b> Carrigaline APSR, Preferred Option: Permanent flood walls and/or revetments and/or embankments to manage tidal and fluvial risk. Midleton APSR, Preferred Option: Permanent flood walls and/or embankments to manage both tidal and fluvial risk. Little Island APSR, Preferred Option: Improvement of existing defences |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>Birds listed in Annex 1 of Council Directive 2009/147/EC (Golden plover, Bar-tailed godwit, Common tern)</li> <li>Other regularly occurring migratory species (Little grebe, Great crested grebe, Cormorant, Grey heron, Shelduck, Wigeon, Teal, Pintail, Shoveler,</li> </ul>                             | The generic conservation objective for Cork Harbour SPA is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA. | <ul style="list-style-type: none"> <li>Owenboy estuary (upstream of the narrow channel), holds 2.9% of the total waterfowl of Cork harbour/ the SPA. The intertidal mudflats are an important foraging site.</li> <li>The Ballynacorra River is the estuary of the Owennacurra River and holds 1% of the waterfowl.</li> <li>The Dunkettle</li> </ul> | There are no serious imminent threats to the wintering birds of Cork Harbour SPA. However, recreational activities are high in some areas, including jet skiing which causes disturbance to roosting birds. General and potential threats come from: aquatic pollution (although | <b>Alone</b><br>Carrigaline APSR and Midleton APSR. The proposed flood walls will be along the SPA boundary in the Owenboy and Owennacurra/ Ballynacorra estuaries. During construction, there will be some disturbances to intertidal habitats in a 10-20m wide strip along the alignment of the defences, as a result of excavation for foundations, temporary works, etc. In the long term, maintenance of the existing line of defence may lead to habitat loss through coastal squeeze. There is potential for disturbance to bird populations using the mudflat areas, as a result of noise and activity associated with the works. However, given the presence of roads running close to the estuary shore, and the evident habituation of the bird populations in the estuaries | <b>Alone</b><br><b>Yes - Carrigaline and Midleton APSRs:</b><br>Undertaking the works between April and August will avoid the main migration and wintering period, and the use of a non-percussive piling technique will reduce noise disturbance. Use bird survey data to guide mitigation        | <b>Alone – No</b><br>It is unlikely that an adverse effect on the integrity of Cork Harbour SPA will occur as a result of the scheme alone.<br><br><b>In-combination – No</b><br>It is unlikely that there will be an adverse in-combination effect on the |

| Special conservation interests and potential issues (not including features with a non-significant presence)                                                                                                                                                                                                                                                | Conservation objectives                                                                                                                               | Contribution of feature to ecological structure and function of site                                                                                                                                                       | Contribution of management or unauthorised sources to feature and/or the feature condition                                                                                     | Adverse effect of proposal alone and in-combination on feature and/or site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Can adverse effects be avoided?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Adverse effect on integrity?                                                                                                                                                                          |
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| <p>Goosander, Oystercatcher, Grey plover, Lapwing, Dunlin, Black-tailed godwit, Curlew, Redshank, Black-headed gull, Common gull, Lesser black-backed gull)</p> <p>Potential issues: temporary damage to intertidal habitats and disturbance to bird populations, during construction; loss of habitat in the long term as a result of coastal squeeze.</p> |                                                                                                                                                       | <p>area of Cork harbour is in the north-western corner, and holds 8.9% - 10.4% of the waterfowl. This is a very significant proportion of the SPA population, despite covering a relatively small area of the harbour.</p> | <p>there are no apparent significant ecological impacts at present); oil pollution as a result of shipping; and land claim for industrial, port-related and road projects.</p> | <p>to current activity and noise levels associated with the roads, their response to additional activity may be limited.</p> <p><i>Little Island APSR.</i> The application of the preferred option for Little Island APSR would involve the improvement of a sluice beneath the N25 motorway. The sluice is over 300m from the boundary of the SPA, and the works would be screened from the main intertidal habitats and birds and by embankments and motorway access roads. In addition, the baseline level of noise from the motorway and nearby industrial site at Inchera is likely to be such that noise from the works will not have any effect on the birds.</p> <p><b>In-combination</b><br/>The potential for significant adverse 'in-combination' effects was identified at the 'strategic level, as a result of further developments proposed for the Carrigaline, Middleton and Little Island areas which could act in synergy with the CFRMP to increase disturbance pressures on SPA bird species.</p> | <p>measures. Investigate potential for intertidal habitat creation.<br/><b>N/A - Little Island APSR:</b> No adverse effects are expected.</p> <p><b>In-combination - Yes</b><br/>A review of other plans will, therefore, be undertaken at the project stage as part of the project level Appropriate Assessment. This project specific Appropriate Assessment and EIA process, and the six yearly CFRMP review cycle, will ensure that the interactions do not adversely affect the integrity of Cork Harbour SPA.</p> | <p>integrity of Cork Harbour SPA.</p> <p>The CFRMP recognises Cork Harbour SPA as a constraint in the scheme design and this will be taken forward to the project stage to avoid adverse effects.</p> |
| <b>Great Island Channel SAC:</b> <i>Middleton APSR</i> , Preferred Option: Permanent flood walls and/or embankments to manage both tidal and fluvial risk. <i>Little Island APSR</i> Preferred Option: Improvement of existing defences                                                                                                                     |                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                       |
| <ul style="list-style-type: none"> <li>Mudflats and sandflats not covered by sea water at low tide</li> <li>Atlantic salt</li> </ul>                                                                                                                                                                                                                        | <p>The generic conservation objective for Great Island Channel SAC is to maintain or restore the favourable conservation condition of the Annex I</p> | <ul style="list-style-type: none"> <li>The Ballynacorra River is the estuary of the Owennacorra River and provides the main source of</li> </ul>                                                                           | <p>The SAC receives polluted waters from agricultural, domestic and industrial sources, but pollution levels</p>                                                               | <p><b>Alone</b><br/><i>Middleton APSR.</i> The proposed flood walls/ embankments along the eastern bank of the Owennacorra/Ballynacorra estuary, in south Middleton, would be on the boundary of the SAC. However, the works are only likely to directly</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p><b>Alone Yes - Middleton APSR:</b> Investigate the possibility of intertidal habitat</p>                                                                                                                                                                                                                                                                                                                                                                                                                             | <p><b>Alone – No</b><br/>It is unlikely that an adverse effect on the integrity of Great Island Channel</p>                                                                                           |

| Special conservation interests and potential issues (not including features with a non-significant presence)                                  | Conservation objectives                                                                                                                                                                                 | Contribution of feature to ecological structure and function of site                                                                                                                                                                                                                                                                                                                                                                                             | Contribution of management or unauthorised sources to feature and/or the feature condition                                                                                                                                                                                                    | Adverse effect of proposal alone and in-combination on feature and/or site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Can adverse effects be avoided?                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Adverse effect on integrity?                                                                                                                                                                                                                                                                                                                                                          |
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| <p>meadows</p> <p>Potential issues: encroachment on intertidal habitats; loss of habitat in the long term as a result of coastal squeeze.</p> | <p>habitats for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Mudflats and sandflats not covered by sea water at low tide;</li> <li>• Atlantic salt meadows;</li> </ul> | <p>freshwater to the SAC. The area is occupied principally by mudflats at low tide, but saltmarshes are extensive in the northern section north of the N25 motorway.</p> <ul style="list-style-type: none"> <li>• Little Island. The part of the SAC that is in the APSR is the western edge between Glounthaune and Carrigrenan Point/Harbour Point Cork. Mudflats are extensive, but only small patches of saltmarsh exist in this part of the SAC.</li> </ul> | <p>are not excessive, and the macro-invertebrate fauna appears normal. Greatest threats come from road works, infilling, sewage outflows and possible marina developments. Cord grass is well established and may have caused some alterations to the intertidal and salt marsh habitats.</p> | <p>impact on intertidal habitats along a narrow strip (10-20m) of mudflat between the main channel and Bailick Road. Temporary damage will occur during construction, but there is unlikely to be a significant permanent impact. In the long term, maintenance of the existing line of defence may lead to habitat loss through coastal squeeze.</p> <p><i>Little Island APSR.</i> Although the Little Island APSR is partially within the Great Island Channel SAC, this does not include the western side where the proposed works would be located. The proposed works site is approximately 3.6km upstream of the SAC boundary and the effects of the works will be very localised. It will not, therefore, have any effect on the SAC.</p> <p><b>In-combination</b><br/>No significant adverse 'in-combination' effects were identified at the 'strategic level, although there is potential for such impacts at a local level depending on the design/nature of actions implemented through the CFRMP and the other plans.</p> | <p>creation.</p> <p><b>N/A - Little Island APSR:</b> No adverse effects are expected.</p> <p><b>In-combination - Uncertain</b><br/>A review of other plans will, therefore, be undertaken at the project stage as part of the project level Appropriate Assessment. This project specific Appropriate Assessment and EIA process, and the six yearly CFRMP review cycle, will ensure that the interactions do not adversely affect the integrity of Great Island Channel SAC.</p> | <p>SAC will occur as a result of the scheme alone.</p> <p><b>In-combination – No</b><br/>It is unlikely that there will be an adverse in-combination effect on the integrity of Great Island Channel SAC.</p> <p>The CFRMP recognises Great Island Channel SAC as a constraint in the scheme design and this will be taken forward to the project stage to avoid adverse effects.</p> |

## Glossary of terms

**Alluvial** Found on or in deposits of sand, silt, clay, gravel, or other matter deposited by flowing water, as in a riverbed or floodplain.

**Analysis Unit** These cover large spatial scale and are large sub-catchments or areas of tidal influence.

**Annual exceedence probability (AEP)** Historically, the likelihood of a flood event was described in terms of its return period. For example, a 1 in 100 year event could be expected to be equalled or exceeded on average once every 100 years. However, there is a tendency for this definition to be misunderstood. There is an expectation that if such an event occurs, it will not be repeated for another 100 years. However, this is not the case; to try to avoid the misunderstanding, flood events are expressed in terms of the chance of them occurring in any year. This can be stated in two ways, namely a percentage or a probability. Taking the above example, we would say that this event has a one per cent, or 1 in 100, chance of being equalled or exceeded in any year.

**Areas of Potential Significant Risk (APSR)** are existing urban areas with high degrees of flood risk and hence economic damage.

**Assessment Unit** Define the spatial scale at which flood risk management options are assessed. Assessment Units are defined on four spatial scales ranging in size from largest to smallest as follows: catchment scale, Analysis Unit (AU) scale, Areas of Potential Significant Risk (APSR) and Individual Risk Receptors (IRR).

**Biodiversity** Biological diversity, the number and abundance of species present.

**Birds Directive** European Community Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended). The Directive is implemented in Ireland through The Wildlife Act 1976, as amended and the European Communities (Birds and Natural Habitats) Regulations 2011. It establishes a comprehensive system for the protection of all wild birds.

**Catchment** A surface water catchment is the total area of land that drains into a watercourse.

**Catchment Flood Risk Management Plan (CFRMP)** is a large-scale strategic planning framework for the integrated management of flood risks to people and the developed and natural environment in a sustainable manner.

**Coastal squeeze** The term 'coastal squeeze' is applied to the situation where the extent of coastal habitats is diminishing as it is 'squeezed' between fixed landward boundaries (artificial or otherwise) and the rising sea level.

**Conservation objectives** These are goals or broad targets describing the desired state of a habitat, species population or conservation site.

**Dabbling duck** Species of ducks that feed at the water's surface rather than diving for their food.

**Estuary** A semi-enclosed coastal body of water with one or more rivers or streams flowing into it, and with an open connection to the sea.

**Estuarine** Formed in, found in or pertaining to estuaries.

**EU Directive** Legislation issued by the European Union that is binding on Member States in terms of the result to be achieved, but leaves choice as to methods.

**Eutrophication** Excessive growth of plant life, especially algae, produced in waters rich in mineral and organic nutrients, and causing water quality and ecological problems.

**Favourable conservation status** The status of natural habitats and species whose natural range, areas covered and populations are stable or increasing, and are likely to continue as such for the foreseeable future.

**Flood Defence** A structure (or system of structures) for the alleviation of flooding from rivers or the sea.

**Flood event** An occurrence of flooding.

**Flood Risk** The level of flood risk is the product of the frequency or likelihood of flood events and their consequences (such as loss, damage, harm, distress and disruption).

**Flood Risk Management** The activity of understanding the probability and consequences of flooding, and seeking to modify these factors to reduce flood risk to people, property and the environment. This should take account of other water level management and environmental requirements, and opportunities and constraints. It is not just the application of physical flood defence measures.

**Flood Risk Management Measure** Structural and non-structural interventions that modify flooding and flood risk either through changing the frequency of flooding, or by changing the extent and consequences of flooding, or by reducing the vulnerability of those exposed to flood risks.

**Flood Risk Management Option** Can be either a single flood risk management measure in isolation or a combination of more than one measure to manage flood risk.

**Flood Warning** To alert people of the danger to life and property within a community.

**Floodplain** Any area of land over which water flows or is stored during a flood event or would flow but for the presence of flood defences.

**Fluvial** Pertaining to a watercourse (river, stream or lake).

**Geomorphology** The science concerned with understanding the form of the Earth's land surface and the processes by which it is shaped, both at the present day as well as in the past.

**Groundwater** Water occurring below ground in natural formations (typically rocks, gravels and sands). The subsurface water in the zone of saturation, including water below the water table and water occupying cavities, pores and openings in underlying soils and rocks.

**Habitat** The place where an organism or species normally lives and is characterised by its physical characteristics and/or dominant type of vegetation.

**Habitats Directive** European Community Directive (92/43/EEC) on the Conservation of Natural Habitats and of Wild Flora and Fauna. Known as the 'Habitats Directive', and is implemented in Ireland through the European Communities (Birds and Natural Habitats) Regulations 2011. It establishes a system to protect certain fauna, flora and habitats deemed to be of European conservation importance.

**In-combination** This refers to the assessment of the effects of more than one scheme acting together.

**Individual Risk Receptors** Essential infrastructure assets such as a motorway or potentially significant environmentally polluting sites.

**Intertidal** This refers to habitats that exist between high tide and low tide levels.

**Inundation** To cover with water - especially flood waters.

**Land Management** Various activities relating to the practice of agriculture, forestry, etc.

**Land Use** Various designations of activities, developments, cropping types, etc, for which land is used.

**Local Authority Development Plans** Development plans are the blueprint for the planning and development of within a local authority area. Each plan sets out the overall planning policies of the local authority, and consists of a written statement and a series of maps.

**Natura 2000** European network of protected sites which represent areas of the highest value for natural habitats and species of plants and animals which are rare, endangered or vulnerable in the European Community. The *Natura 2000* network will include two types of area. Areas may be designated as Special Areas of Conservation (SAC) where they support rare, endangered or vulnerable natural habitats and species of plants or animals (other than birds). Where areas support significant numbers of wild birds and their habitats, they may become Special Protection Areas (SPA). SACs are designated under the Habitats Directive and SPAs are classified under the Birds Directive. Some very important areas may become both SAC and SPA.

**Ramsar site** Wetland site of international importance designated under the Ramsar Convention on Wetlands of International Importance 1971, primarily because of its importance for waterfowl.

**Riparian** Relating to the strip of land on either side of a watercourse.

**River Basin Management Plan** describes the unique characteristics of each river basin, and the pressures it faces from pollution and over-use. The Lee Catchment forms part of the South Western River Basin District.

**Riverine** Pertaining to a watercourse (river or stream) and its floodplain.

**Special Area for Conservation (SAC)** SACs are internationally important sites, protected for their habitats and non-bird species. They are designated, as required, under the EC Habitats Directive.

**Special Protection Area (SPA)** SPAs are sites of international importance for breeding, feeding and roosting habitat for bird species. They are designated, as required, under the EC Birds Directive.

**Species richness** A measure of the number of species in a particular area.

**Strategic Environmental Assessment (SEA)** Assessment under EU Directive 2001/41/EC. SEA is a multi-staged process, designed to enable the integration of environmental considerations at key stages of the plan development process and maximise the potential for environmental impacts to be minimised.

**Surface Water** Water in rivers, estuaries, ponds and lakes.

**The Office of Public Works (OPW)** The lead agency with responsibility for flood risk management in Ireland.

**Tidal** Related to the sea and its tide.

**Waders** Also known as shorebirds. Birds that feed in intertidal habitats, especially mud and sand flats, and shallow freshwater habitats. Typical species are curlew, oystercatcher and redshank.

**Water courses** Water features include rivers, lakes, ponds, canals, harbours and coastal waters.

**Waterfowl** Ducks, geese, waders and other water birds such as moorhens, coots, grebes and herons.

**Water Framework Directive (WFD)** EU Water Framework Directive 2000/60/EC sets out a system for the integrated and sustainable management of river basins so that the ecological quality of waters is maintained in at least a good state or is restored. The Directive lays down a six-yearly cycle of river basin planning.

**Wetland** Wetlands are areas of marsh, fen, peatland or water, with water that is fresh, brackish or salt, including shallow areas of sea.

**Wildfowl** Ducks, geese and waders.

**Wildfowling** The practice of hunting ducks, geese, or other waterfowl, either for food, sport, or both.