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Limerick Regeneration

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Introduction

1.1 Protection of biodiversity

Biodiversity is a contraction of the words 'biological diversity' and describes the enormous variability in species, habitats and genes that exist on Earth. It is an integral component of our heritage while also providing food, building materials, fuel and clothing, maintaining clean air, water, soil fertility and pollinating crops. A study by the Department of Environment, Heritage and Local Government placed the economic value of biodiversity to Ireland at €2.6 billion annually (Bullock et al., 2008) for these 'ecosystem services'.

All life depends on biodiversity and its current global decline is a major challenge facing humanity. In 1992, at the Rio Earth Summit, this challenge was recognised by the United Nations through the Convention on Biological Diversity which has since been ratified by 193 countries, including Ireland. Its goal to significantly slow down the rate of biodiversity loss on Earth has been echoed by the European Union, which set a target date of 2010 for halting the decline. This target was not met but in 2010 in Nagoya, Japan, governments from around the world set about redoubling their efforts and issued a strategy for 2020 called 'Living in Harmony with Nature'. In 2011 the Irish Government incorporated the goals set out in this strategy, along with its commitments to conservation biodiversity under national and EU law, in the second national biodiversity action plan (Dept. of Arts, Heritage and the Gaeltacht, 2011).

The main policy instruments for arresting the decline in biodiversity have been the Birds Directive of 1979 and the Habitats Directive of 1992. These Directives require member states to designate areas of their territory that contain important bird populations in the case of the former; or a representative sample of important or endangered habitats and species in the case of the latter. These areas are known as Special Protection Areas (SPA) and Special Areas of Conservation (SAC) respectively. Collectively they form a network of sites across the European Union known as Natura 2000. A recent report into the economic benefits of the Natura 2000 network concluded that "there is a new evidence base that conserving and investing in our biodiversity makes sense for climate challenges, for saving money, for jobs, for food, water and physical security, for cultural identity, health, science and learning, and of course for biodiversity itself" (EC, 2013).

Unlike traditional nature reserves or national parks, Natura 2000 sites are not 'fenced-off' from human activity and are frequently in private ownership. It is the responsibility of the competent national authority to ensure that 'good conservation status' exists for their SPAs and SACs and specifically that Article 6(3) of the Directive is met. Article 6(3) requires that an 'appropriate assessment' (AA) be carried out for these sites where projects, plans or proposals are likely to have an effect. In some cases this is obvious from the start, for instance where a road is to pass through a designated site. However, where this is not the case, a preliminary screening must first be carried out to determine whether or not a full AA is required.

1.2 Methodology

The assessment was carried out in accordance with the following methodologies and guidelines:

- 'Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC' (Oxford Brookes, 2001).
- 2. 'Appropriate Assessment of Plans and Projects in Ireland'. (Department of Environment, Heritage and Local Government, 2009)
- 3. The 'Guidelines for Ecological Impact Assessment in the United Kingdom' by the Institute of Ecology and Environmental Management (IEEM, 2006).
- 4. 'Appropriate Assessment of plans' (Scott-Wilson et al., 2009)

Reference is also made to the Circulars from the Department of Environment, Community and Local Government on the transposition of the Habitats Directive and the Strategic Environmental Assessment Directive into Irish law: Letter PSSP 6/2011; Letter PSSP 5/2001; and Circular NPW 1/10 & PSSP 2/10.

In accordance with the above mentioned guidance notes, the following steps are followed:

Step 1: Analysis of the Natura 2000 network This involves assessing the current status of SACs and SPAs within the zone of influence of the plan and underlying trends affecting them. This is done through a combination of literature review, site survey, and consultation with relevant stakeholders.

Step 2: Analysis of the Framework Implementation Plan (henceforth referred to as the LRFIP) Identifying aspects of the draft LRFIP that may effect the integrity of the Natura 2000 network.

Step 3: Analysis of other plans

Identifying aspects of other plans or projects that may act 'in combination' with the LRFIP to effect the integrity of the Natura 2000 network.

Step 4: Determination of significance

Determination whether any of these effects, either alone or in combination with other plans and projects, will be significant.

Step 5: Avoidance or mitigation

Recommendation of avoidance or mitigation measures to ensure that no significant effects occur to the integrity of the Natura 2000 network.

The AA process is an iterative one where the report actively identifies potential effects, the plan or project is then modified to avoid or mitigate these effects, and then the new plan is re-assessed until such point as no significant effects are predicted to occur. It is also important to note that the 'appropriate assessment' is made by the relevant competent authority, in this case Limerick City Council. This Natura Impact Report (NIR) is prepared to aid them in that decision.

In the event that significant effects remain in the final version of the plan, then it can only proceed where all alternatives to the plan have been fully examined and there are 'Imperative Reasons of Overriding Public Interest' (IROPI) as per Article 6(4) of the Directive. Where there are impacts to priority habitats the development can only proceed for reasons of human health and safety, important environmental reasons or other reasons that have been approved by the European Commission. Compensatory measures must be provided and both the Minister for Environment, Community and Local Government and the European Commission must be informed.

2.0 Step 1 – Analysis of the Plan area

2.1 Location and extent

The Limerick Regeneration Areas are in four distinct parcels of land within the boundary of Limerick City. Collectively they are shown in figure 1.

2.1.1 Moyross

The Moyross area is located along the northern fringes of the city. It is bisected by a mainline railway line and is composed of significant areas of urban/built development. It does however contain areas of wetland habitat associated with the River Shannon and which are within the boundary of the Lower River Shannon SAC. A new road route, the Coonagh-Knockalisheen Distributor Road, has been approved by An Bord Pleanála and will pass to the north of developed areas within Moyross. Figure 2 shows the relationship between the regeneration area and the aforementioned SAC.

2.1.2 St. Mary's park

St. Mary's park is located on the north side of Limerick city centre. It is surrounded to the west and north by the River Shannon, to the east by the Abbey River, and to the south by Limerick city. Habitat mapping has been carried out by OPENFIELD due to the sensitive nature of the natural environment in this area. This is shown in figure 3 along with the boundary of the Regeneration Area and the SAC.

2.1.3 Ballinacurra and Southill

Ballinacurra are both located to the south of Limerick city centre and are largely enclosed within other suburban areas of the city. Unlike the two previous Regeneration Areas they are not near the Lower River Shannon SAC and no sensitive habitats associated with this SAC have been recorded from within these areas.

2.2 Natura 2000 sites within the Zone of Influence

Best practice guidance (DoE, 2009) recommends that all Natura 2000 sites within 15km of the plan boundary be initially screened for impacts. This is a somewhat arbitrary distance and may be modified as this process progresses. Within this radius seven SACs and one SPA have been identified from the NPWS website (www.npws.ie). These are shown in figure 4.



Figure 1: Boundaries of the four areas within Limerick City that are part of the Regeneration project



Figure 3: Moyross Regeneration area (in red line) and the Lower River Shannon SAC (in green) showing overlap of the two areas



Wet grassland - GS4

Lower River Shannon SAC

Figure 2: Overview of St. Mary's park and King's Island showing the boundary of the Lower River Shannon SAC. It also shows the extent of sensitive habitats and known locations of alien invasive species.



Figure 4: 15km radius of LRFIP boundary (from www.npws.ie).

2.2.1 The Lower River Shannon SAC

This is a very large SAC that stretches from Killaloe to Loop head/Kerry head and is over 720 km2 in area. The reasons why this area falls under the SAC designation are set out in the site qualifying interests. They are either habitat types listed in Annex I or species listed in Annex II of the Habitats Directive. This information is provided by the National Parks and Wildlife Service (NPWS) and is shown in table 1 below.

2.2.2 The River Shannon and River Fergus Estuaries SPA

The estuaries of these two rivers form the largest expanse of intertidal mudflats in Ireland. SPAs are designated for their internationally important species (listed on Annex I of the Birds Directive) or population sizes (>1% of the global population or >20,000 individuals). Most recent available data indicate that a mean of 10,235 birds utilised the area during the winters from 2006-11 (Crowe et al., 2012). This includes internationally important numbers of Mute swan Cygnus olor and Whooper swan C. cygnus and nationally important numbers of Shelduck Tadorna tadorna, Wigeon Anas penelope, Teal A. crecca, Cormorant Phalacrocorax carbo, Dunlin Charadrius alpina, Black-tailed godwit Limosa limosa and Curlew Numenius arquata. The SPA's features of interest (analogous to qualifying interests for SACs) include all these species (with the exception of Mute swan) plus Light-bellied brent goose Branta bernicula hrota,

Code	Habitat/Species Type
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1150	Coastal lagoons
1230	Vegetated sea cliffs of the Atlantic and Baltic coasts
1310	Salicornia and other annuals colonizing mud and sand
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
1410	Mediterranean salt meadows (Juncetalia maritimi)
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
1110	Sandbanks which are slightly covered by sea water all the time
1160	Large shallow inlets and bays
1170	Reefs
1220	Perennial vegetation of stony banks
1320	Spartina swards (Spartinion maritimae)
6410	Molinia meadows on calcareous, peaty or claey-silt-laden soils (Molinion caeruleae)
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
1099	Lampetra fluviatilis River lamprey
1096	Lampetra planeri Brook lamprey
1095	Petromyzon marinus Sea lamprey
1106	Salmo salar Atlantic salmon
1349	Tursiops truncatus Bottle-nosed dolphin
1355	Lutra lutra Otter
1029	Margaritifera margaritifera Freshwater pearl mussel

Table 1: Qualifying interests for the Lower River Shannon SAC (from NPWS)

Pintail A. acuta, Scaup Aythya marila, Shoveler Anas clypeata, Ringed plover Charadrius hiaticula, Golden plover Pluvialis apricaria, Grey plover Pluvialis squatarola, Lapwing Vanellus vanellus, Knot Calidris canutus, Bar-tailied godwit L. lapponica, Redshank Tringa totanus, Greenshank T. nebularia and Blackheaded gull Chroicocephalus ridibundus.

2.2.3 Glenomra Wood SAC

This is a small area of deciduous woodland with populations of protected mammals (Badger Meles meles, Pine marten Martes martes and Hare Lepus timidus hibernicus) and amphibian (Common frog Rana temporaria). Table 2 details its qualifying interests. It has a single qualifying interest: the priority habitat type 'Old sessile oak woods with Ilex and Blechnum in the British Isles (code: 91Ao).

2.2.4 Danes Hole Poulnalecka SAC

This is a small cave that is concealed under a broadleaved woodland. It is home to an internationally important population of the Annex II (Habitats Directive) listed Lesser Horseshoe bat Rhinolophus hipposideros. The SAC contains a winter hibernating roost and a summer maternity roost, as well as vital foraging grounds for this species.

2.2.5 Ratty River Cave SAC

Similar to the Danes Hole Poulnalecka SAC this is an internationally important roost for the Lesser Horseshoe bat, a species only found in some west of Ireland counties.

2.2.6 Askeaton Fen Complex SAC

This area is a mosaic of wetland habitats from marsh dominated by the Saw Sedge Cladium mariscum to wet grassland and scrub. It is of importance for rare water beetles and has two qualifying interests as detailed in table 5. Cladium fens are a priority habitat type indicating their importance at a European level.

2.2.7 Slieve Bernagh Bog SAC

This is an upland area centred on the peaks of Moylussa and Cragnamurragh and is predominantly composed of upland blanket bog habitat. It is home to distinctive peatland species as well as important birds such the Annex I (Birds Directive) listed Hen Harrier Circus cyaneus. The effects of the LRFIP must be measured against the SAC's/SPA's conservation objectives. However for most of these SACs management plans have not been prepared and so only generic conservation objectives are available. The NPWS does state that the integrity of the area is dependent upon the following generic conservation objective:

To maintain or restore the favourable conservation condition of the species/habitats listed as Special Conservation Interests [features of interest]/qualifying interests for this SPA/SAC.

Favourable conservation status of a habitat is achieved when:

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

Code	Habitats/Species Type
8310	Caves not open to the public
91A0	Old sessile oak woods with Ilex and Blechnum in British Isles
1303	Rhinolophus hipposideros

Table 2: Qualifying interests for the Danes Hole Poulnalecka SAC

Code	Habitats/Species Type
8310	Caves not open to the public
1303	Rhinolophus hipposideros

Table 3: Qualifying interests for the Ratty River Cave SAC

Code	Habitats/Species Type
7210	Cladium fens
7230	Alkaline fens

Table 4: Qualifying interests for the Askeaton Fen SAC

Code	Habitats/Species Type
7130	Blanket bog (*active only)
4010	Northern Atlantic wet heaths with Erica tetralix
4030	European dry heaths

Table 5: Qualifying interests for Slieve Bernagh Bog SAC

The favourable conservation status of a species is achieved when:

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

Specific conservation objectives have been set for the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. While it is not necessary to reproduce these in full they do discuss each qualifying interest/feature of interest in detail and define objectives in line with the generic objectives cited above (NPWS, 2012).

Figures 2 & 3 show the location of Natura 2000 sites in the immediate vicinity of the Moyross and St. Mary's Park/King's Island areas respectively. As can be seen a significant portion of the LRFIP area is located within the SAC boundary in these two Regeneration Areas. The Southill and Ballinacurra Regeneration Areas are not within or adjacent to any Natura 2000 area or associated with habitats or species listed in Annexes I or II of the Habitats Directive respectively.

2.3 Literature review

A 'site synopsis' report is available for the Lower River Shannon SAC however this does not give specific habitat or species distribution data that pertains directly to the St. Mary's Park or Moyross areas. This report can be downloaded from the NPWS at http://bit.ly/16D9zaN.

St. Mary's Park

In 2007 an ecological study was carried out by Mr

Roger Goodwillie and this focussed on the portion of King's island within the SAC boundary (Goodwillie, 2007). It found no species of flora protected under the Flora Protection Order (Statutory Instrument No. 94 of 1999. Flora (Protection) Order). This survey delineated the study area into three zones: an upper, dry area (A); a middle, species poor, wet area (B); and a lower, wet, species rich area (C). This delineation is reproduced in figure 5. While the island can be considered within the floodplain of the Shannon, extensive human interference, particularly through drainage and the construction of an embankment encircling the island, has resulted in this degree of variation. Goodwillie concludes that with the exception of the lower zone, the area is of low floristic diversity and so of low ecological value. While a habitat map is not given, the report states that only one habitat type, Alluvial wet woodlands (code: 91Eo), is present, and, contrary to the statement in the report, this is a priority habitat type (DG Environment, 2003). The exact location, extent, or condition of this habitat is not given.

The report also notes that the two wet zones are a habitat for a number of wetland bird species, including the Whooper swan Cygnus cygnus, a bird listed under Annex I of the Birds Directive. The river is also home to Otter Lutra lutra which is listed on Annex II of the Habitats Directive and is among the qualifying interests of the SAC. The report suggests that Otter may use the wet area of land for foraging.

The Status of EU Protected Habitats and Species in Ireland (NPWS, 2008) publishes the status and distribution of Annex I habitats and Annex II species in Ireland. It shows that of the habitats and species listed in table 1, only the following are present within the 10km square around the site:

Habitats:

- Estuaries (code: 1130)
- Tidal mudflats and sandflats (code: 1140)



Figure 5: Goodwillie delineation of habitats (Goodwillie, 2007 extract)

- Atlantic salt meadows (code: 1330)
- Floating river vegetation (code: 3260)
- Molinia meadows (code: 6410)
- Alluvial forests (code: 91Eo)

Species:

- River lamprey (code: 1099)
- Brook lamprey (code: 1096)
- Sea lamprey (code: 1095)
- Atlantic salmon (code: 1106)
- Otter (code: 1355)

This list does not refer to Annex I habitats or Annex II species not listed as qualifying interests for the site but may be present within this portion of the SAC.

While Bottle-nosed dolphin (code: 1349) are recorded from this 50 km square, they are not normally associated with the upper reaches of tidal rivers.

The Shannon at this point is known to be tidal and so

would not provide suitable habitat for breeding Atlantic salmon. However, all migratory fish that spawn in the catchment, upstream of Limerick, must pass through the river at this point. The presence of Otter in this area was not recorded during the most recent national Otter survey (Bailey et al., 2006) however this does not confirm its absence.

Freshwater pearl mussels are known from the Cloon river in county Clare, downstream of Limerick city (Moorkens, 1999).

All three Lamprey species are known from the lower Shannon catchment and spawn in tributaries upstream of Limerick city (Kurtz & Costello, 1999).

Water quality across Ireland is monitored by the Environmental Protection Agency (EPA). The tidal portion of the lower river Shannon was most recently assessed as 'unpolluted' and of 'good' stautus under the Water Framework Directive. The nearest freshwater monitoring station, at Athlunkard Bridge, meanwhile was determined to be Q3-4. This figure is equivalent to an Ecological Quality Ratio of 0.7, or of 'moderate' status under the Water Framework Directive (data from www.epa.ie).

The NPWS maintain a 'mapviewer' tool on their web site (www.npws.ie) which indicates records of protected species within 10 km squares. St. Mary's park is located within the R55 square and five protected plants are listed. These are given in table 2 but do not indicate the absence of other rare or protected species.

None of these species was recorded during the series of surveys carried out by Goodwillie although as an aquatic plant, the Opposite-leaved pondweed was not within the scope of this report. The Conservation Objectives report from NPWS for the Lower River Shannon indicate the presence of the protected Triangular Clubrush Schoenoplectus triqueter to the north-east of King's Island.

An indicative habitat map of the Regeneration Area is shown in figure 2. It shows that seven Fossitt habitats are present. The species list gathered during the site survey carried out by OPENFIELD in January 2010 is short due to seasonal constraints and so is augmented with results from the Goodwillie study. These data are presented in Annex I of this report. The main habitats are buildings and artificial surfaces – BL3 and amenity grassland – GA2. These are low in species diversity and consequently are of minimal biodiversity value. For this reason these areas are not included within the SAC boundary.

To the east of the St. Mary's park estate and also on the western banks of the Shannon there are strips of recolonising bare ground – ED2. This area has been subject to grazing, dumping and infill and is higher in elevation than the adjacent wet area. While this habitat can be species rich it is mostly colonised by opportunistic plants that are common and widespread. This area is associated with foraging birds and, during the summer, is likely to attract butterflies and other insects. The habitats and species here are of moderate biodiversity value and are not associated with the SAC or its qualifying interests. It is adjacent to, but outside the SAC boundary.

The stretches of the Shannon and Abbey rivers surrounding King's island are lowland/depositing river – FW2 and constitute the primary feature of the SAC. An Otter Lutra lutra was observed swimming in the river along with Mute swan Cygnus olor, Moorhen Gallinula chloropus, Greylag goose Anser anser, Grey heron Ardea cinerea, Cormorant Phalacrocorax carbo and Little grebe Tachybaptus ruficollis. The Otter is listed on Annex II of the Habitats Directive and is one of the SAC's qualifying interests.

Along the river banks, and fringing almost the entire island, there is a strip of riparian woodland – WN5. It is dominated with Willow Salix sp. with occasional Alder Alnus glutinosa and Ash Fraxinus excelsior. On the island's western shore this fringe is narrow and in some places there is open grassland (with Creeping buttercup Ranunculus repens and Reed canary grass Phalaris arundinacea). This area is wet grassland – GS4 and is a part of the rivers' floodplain. However on the

Species	Habitat (Parnell et al., 2012)	Record status (Preston et al., 2002)
Colchicum autumnale Autumn crocus	Meadows and river banks	pre-1970
Groenlandia densa Opposite-leaved pondweed	Ditches, streams and canals [aquatic]	Current
Hordeum secalinum Meadow barley	Damp places, chiefly near the sea	Current
Mentha pulegium Penny royal	Damp sandy places	pre-1970
Scirpus triqueter Triangular club rush	Tidal mud	Present

Table 6: Qualifying interests for Slieve Bernagh Bog SAC

eastern shore it is much more developed and uninterrupted. This habitat is an example of the Annex I priority type Alluvial forests (91Eo) and is one of the rarest native woodland types in Ireland (Little et al., unknown year). It is of high biodiversity value and home to a range of woodland species as well as being vital for the preservation of water quality and the prevention of bank erosion. During the survey it had been reported that a pair of Kingfisher Alcedo atthis were foraging along the river (passerby, pers. comm.). The Kingfisher is listed on Annex I of the Birds Directive.

The raised embankment circling the island separates the main channel of the river from the land within. A series of drainage ditches – FW4 connect the drier land to the north and west with the wet fields in the east. It would appear that these drains feed water into the wet area rather than away from it and are connected to the river via an outlet pipe on the western side. This is a one-way valve which would indicate that the wetland is not directly connected to the floodplain of the river. However, consultation with the OPW and Limerick city council suggests that some interaction is likely due to the large volume of water that is seen during flood events. It was their opinion that this is certainly happening and is due either to the valve being occasionally faulty or water flowing over the top of the embankment at high tides. It must therefore be assumed that the wetland is part of the river's flood plain and provides storage of water during flood events. The nature of the drainage ditches vary from open trenches with Reed canary grass, to stretches with open water and abundant overhanging Willow. This habitat is connected to the SAC via the area's hydrology.

The large area of wet fields to the east is approximately 11.7 hectares in extent and is entirely within the SAC boundary. At the time of the survey it was not possible to walk through this area due to the depth of water and nature of the soft mud. Apart from the abundance of Yellow iris Iris pseudacorus and occasional Bulrush Typha sp. in the wetter margins, it was not possible to identify many of the species. Goodwillie surveyed this area thoroughly during his surveys in 2007. He delineated two zones in this area with a wet, species rich area to the west and a drier area to the east with lower species diversity (see figure 5). This distinction was not visible during the winter months. From Goodwillie's description of this area it is tentatively deduced that it is an example of tall-herb swamps – FS1. This is due to the presence of standing water (which distinguishes it from marsh) and the presence of species such as Brooklime Veronica beccabunga, Water forget-me-not Myosotis scorpioides, Water plantain Alisma plantago-aquatica, Fool's water-cress Apium nodiflorum, and Reed sweet grass Glyceria maxima. This habitat type is not listed among the SAC's qualifying interests however it is associated with the Annex I listed habitat 'Hydrophilous tall herb' (6430). In addition to their important habitat function wetlands such as these perform important tasks such as flood alleviation, water purification, the prevention of erosion and the cycling of carbon (Otte, 2003).

This area contains abundant bird life with flocks of Mute swan, Whooper swan Cygnus cygnus (numbering around 22 individuals), Lapwing Vanellus vanellus, Mallard Anas platyrhynchos, Black headed gull Larus ridibundus, Snipe Gallinago gallinago, Teal Anas crecca, and Redshank Tringa totanus. The Whooper swan is listed under Annex I of the Birds Directive. A national census of Whooper swan that took place in January 2010 showed that the wintering population of this bird had increased by 6% since the previous count in 2005 (Boland et al., 2010). The birds utilise a variety of habitats and the St. Mary's Park population is not sufficiently large to be of national importance. Around the fringes there were Robin Erithacus rubecula, Rook Corvus frugilegus, Treecreeper Certhia familiaris, Wren Troglodytes troglodytes, Grey wagtail Motacilla cinerea, Blue tit Parus caeruleus, Dunnock Prunella modularis, Starling Sturnus vulgaris, Linnet Carduelis cannabina, Red wing Turdus iliacus, Chaffinch Fringilla coelobs, Pied wagtail Motacilla alba, Great tit Parus major, Blackbird Turdus merula, House sparrow Passer domesticus, Hooded crow Corvus corone, and Magpie Pica pica.

In summary it can be seen that the area designated as SAC is important for qualifying interests such as freshwater fish, Otter and riparian woodland, but also for features outside the qualifying interests – particularly wintering wetland birds, but also Kingfisher and possibly an Annex I wetland habitat (hydrophilous tall herbs). These habitats perform important functions in the regulation of water flow and the moderation of water quality as well as being valuable for the maintenance of biodiversity in general.

It should be noted that the southern portion of King's

Island was not included in this survey however from aerial photography it can be concluded that this area is made up of buildings and artificial surfaces.

In April 2013 additional survey work was carried out on lands across the Shannon River from St. Mary's Park where a proposed bridge is to be located. This showed that the lands here are composed of recolonising bare ground and amenity grassland. Historic mapping shows that the former area is reclaimed land and evidence of this infill can still be seen today. While the river margin has been colonised with a single line of trees, Salix purpurea, some of which are large, it cannot be considered alluvial woodland because of its structure and function (or rather lack thereof). To the rear of this line there has been extensive colonisation of the alien invasive Japanese Knotweed Fallopia japonica and occasional stands of the Giant Hogweed Heracleum mantegazzianum. Further upstream an area of amenity grassland and buildings affords no margin of riparian vegetation whatever. Further still the land enters the boundary of the SAC and here there are areas of high value riparian woodland.

Moyross

The Knockalisheen Marsh is composed of two distinct land parcels: one large area to the north lying in county Clare; and the smaller area to the south. These areas are described in a site synopsis report for the associated proposed Natural Heritage Area (NPWS, 1997). The larger area is composed of species rich wet grassland and fen and is notable for important flora such as Marsh Helleborine Epipactis palustris and Skullcap Scutellaria galericulata. The southern land parcel is briefly described as "a reedbed of Common Reed Phragmites australis and Bulrush Typha sp."

A brief 'ecological overview' of the Moyross Regeneration Area was produced in April 2008 by EirEco. It described the development site as "isolated open water with reed swamp" and suggests that there is "potential to appeal at least part of the cSAC" (EirEco, 2008). No further details are given as part of this assessment.

2.4 Consultation

2.4.1 NPWS

Written requests for consultation observations have been submitted to the NPWS on a number of occasions since early 2010 in relation to previous iterations of the LRFIP and specific projects within the Regeneration Areas of Moyross and St. Mary's Park. While it is not necessary to detail all of this the most recent correspondence was received in March 2012 in relation to the then Framework Implementation Masterplan for St. Mary's Park. This is reproduced as an appendix to this report.

It states that "given the scale of the development, the provision for three new river bridge crossings, a marina, a flood defence system and extensive demolition and reconstruction of the area, there are likely to be significant effects on the cSAC in the absence of mitigation (siltation, pollution, disturbance, change in flood regime, etc.), and an appropriate assessment is very probably necessary."

It goes on to pose the following questions:

- 1. Will there be direct or indirect loss of habitats for Annex I or II habitat types or species?
- 2. Will there be direct or indirect effects on water quality as a result of the demolition or construction associated with the plan?
- 3. Are there any contaminated or hazardous waste sites in the area of the plan, which could cause deterioration in water quality if disturbed during demolition or construction?
- 4. What will be hydrological impacts of implementing the plan be? Will there be changes in flood regime?
- 5. What will the effects in combination with other plans and projects in the Limerick City area?
- 6. Are their breeding otters in or near the area which would be susceptible to disturbance as a result of the implementation of the plan?
- 7. What guidance for siltation, pollution and invasive species control will be followed in implementing the plan?
- To what extent will the principles of SUDS be adopted in the plan? The wording used for SUDS in the draft South Hill/Ballinacurra Masterplan (September 2008) should be used in this plan, but sufficient spaces must be allowed to ensure SUDS is feasible.

It also went to say that "particular attention should be given to the following:

- a. Opposite leaved pondweed (Groenlandia densa) (listed on the Flora Protection Order under the Wildlife Acts of 1976-2010) occurs in the Limerick Canal;
- b. Whooper swans (listed on Annex I of the Birds

Directive) are known to use the area;

- c. Kingfisher (listed on annex I of the Birds Directive) are very likely to use the area;
- d. Bat species (all bat species are protected by the Wildlife Acts of 1976-2010 and are listed on Annex IV of the Habitats Directive). Daubenton's bats are very likely to use the area and have been recorded less than 1km from the plan area.

On January 29th 2010, as part of consultation for a previous iteration of the LRFIP, there was an on-site meeting with the regional NPWS ranger Ms Elaine Keegan. The area was walked and the status of the various habitats was discussed. It was agreed that the riparian woodland that fringes the north of the island is a priority Annex I habitat. The connection between the wetland and the river was discussed and while an outfall pipe was noted on the western shore this was likely to contain a one-way valve. It was not possible to conclude whether the wetland was directly part of the rivers' floodplain. The importance of the wetland to wintering birds was also discussed despite the fact that this group is not included in the SAC's qualifying interests.

On July 2nd 2013 a meeting was held with NPWS personnel, Mr Jervis Good and Ms Elaine Keegan, at City Hall, Limerick. This focussed on the St. Mary's Park/King's Island area as this is where impacts to sensitive habitats and species are most likely to occur. NPWS was keen that the options for bridge crossings to/from the island be explored in terms of the potential impacts arising from the Plan. Following a site visit it was confirmed that woodland areas fringing the Abbey river are priority alluvial woodland habitat and that any loss of this habitat would require an application to the Department of Arts, Heritage and the Gaeltacht and the European Commission under Article 6(4) of the Habitats Directive. This provision allows projects to proceed under 'Imperative Reasons of Overriding Public Interest' within certain constraints – including that all alternative options have been explored and that compensatory habitat be developed.

2.4.2 Shannon Regional Fisheries Board (ShRFB)

In a brief telephone conversation in 2010 Mr Michael Fitzsimmons of the SRFB (now Inland Fisheries Ireland) confirmed the importance of the lower Shannon river as a passing through point for migratory fish including Atlantic salmon and Lamprey species. He also emphasised that it is an important estuary for breeding Allis shad Alosa alosa, which, although not among the SAC's qualifying interests, are listed on Annex II and V of the Habitats Directive.

He stated that river water quality is likely to have improved in recent years as a result of the Limerick main drainage scheme which has prevented much untreated, or undertreated wastewater from entering the Shannon.

2.4.3 The Office of Public Works (OPW)

Mr Michael Collins, regional engineer with the OPW in Limerick was familiar with the St. Mary's Park area. The outflow pipe and valve to the west of the island is not maintained by the OPW however he felt certain that during flood events, which are mostly driven by the tides, the wetland area is inundated with river water. This may be happening either through the outfall pipe (if the valve was faulty) or by flowing over the top of the embankment.

2.4.4 Limerick County Council

Mr John O'Saughnessy, engineer with Limerick city council confirmed that the aforementioned outflow pipe is regularly maintained by his offices. He also stated that during flood events, such as that in November 2009, water is known to spill over the embankment in this area.

2.5 Trends affecting the site

The greater proportion of the Lower River Shannon SAC is water dependant and recent trends have seen an improvement in water quality. The recently completed Limerick main drainage scheme, which upgraded wastewater treatment facilities in the city, is likely to have been a significant contributor to this trend. This is corroborated by EPA data.

There is no management plan for the Lower River Shannon SAC and so trends in the status of its habitats and species are difficult to determine. Nationally the status of all Habitats Directive habitats and species have been assessed as per Article 17 of the Directive. This assessment (NPWS, 2008) was based on a number of parameters (range; area/population; structure & function/area of suitable habitat; future prospects) and makes a final judgement in term of current status of good, poor, bad or unknown. A summery of the status of the relevant qualifying interests is given below.

Habitats:

Estuaries (code: 1130). Status: Poor. Area and range are good but there was insufficient knowledge on structure and function to assign 'good' status.

Tidal mudflats and sandflats (code: 1140). Status: Poor. Area and range are good but structure and function were considered poor with the most serious threats arising from 'aquaculture, fishing, bait digging, removal of fauna, reclamation of land, coastal protection works, and invasive species particularly cord-grass".

Atlantic salt meadows (code: 1330). Status: Poor While the range was good both area and structure & function were poor. The most common impacts were over-grazing by sheep or cattle and erosion.

Floating river vegetation (code: 3260). Status: Bad Range and area are 'good' but structure & function are 'bad'. This is primarily related to the poor pollution status of many of Ireland's river systems.

Molinia meadows (code: 6410). Status: Bad While range is 'good', both area and structure & function are 'bad' due to agricultural intensification, drainage and land abandonment.

Alluvial forests (code: 91Eo). Status: Bad Range is 'good' but both area and structure & function are bad due to drainage, alien invasive species and fragmentation.

Species:

River lamprey (code: 1099) and Brook lamprey (code: 1096). Status: Good.

These species are not as impacted by weir construction and so all parameters were considered 'good'.

Sea lamprey (code: 1095). Status: Poor All parameters were assessed as 'poor' due to weir construction and 'channel maintenance' i.e. removal of silt. Allis shad (code: 1102). Status: Unknown Its range is considered good but little is known about its nonulation, babitat or future.

its population, habitat or future prospects.

Atlantic salmon (code: 1106). Status: Bad While range was 'good' population was 'bad' and habitat was 'poor'. The salmon is undergoing a long term decline and while improving water quality and the ending of drift netting at sea are positive developments, the overall future prospects are 'poor'. Otter (code: 1355). Status: Poor.

Both range and habitat are 'good' but population is 'poor' due to recent declines of up to 24% nationally.

As can be seen, of the 11 qualifying interests, only two (the River and Brook lampreys) have 'good ecological status', while the remaining nine are either 'poor' or 'bad'. The status of the Allis shad is 'unknown'.

In addition to these published sources there is anecdotal evidence that conifer afforestation in the upper reaches of the catchment and the loss of wetlands through drainage and in-filling have altered the land use pattern surrounding the SAC. Elsewhere, loss of wetlands has been attributed to local flooding and deteriorating water quality (Otte, 2003).

Current best knowledge in the field of climate science suggests that Ireland's climate is changing in line with global trends (Desmond et al., 2009). Changes will continue to be seen in sea temperature, sea level rise and ocean water chemistry with uncertain impacts on biodiversity. Species or habitat specific impact assessments are not available for those identified as qualifying interests for the site.

A number of alien invasive species (AIS) were recorded from the Goodwillie survey including Japanese knotweed Reynoutria japonica, Indian balsam Impatiens glandulifera and Giant hogweed Heracleum mantegazzianum. Further stands were noted near Ballynanty. While these species are recorded from the area on the database of the National Biodiversity Data Centre this does not appear that this represents an accurate picture of the extent of AIS in and around the city.

3.0 Step 2 – Analysis of the Framework Implementation Plan

The LRFIP for the four Regeneration Areas is part of a wider strategy to redevelop areas of north and south Limerick to address issues of social exclusion. This process was steered by the Limerick Regeneration Agencies up to 2012 when these functions were taken into the Office of Regeneration of Limerick City Council.

The LRFIP sets out a basis for the economic, social and physical redevelopment of the areas and is presented in three volumes plus appendices.

Volume 1

Volume 1 sets out the vision of the LRFIP including its history to-date and its main objectives. It details the challenges that are faced by the communities concerned and includes baseline data against which these are set. As such there are extensive passages on the policy and legal/economic framework within which the Plan is set. It contains a section on the environmental context of the Regeneration Areas which details the significance of the Habitats Directive and how it relates to the implementation of the Plan. It goes into the detail of the environmental constraints within which the plan must be delivered, including flooding and ecological sensitivities. Its lists the presence of the SAC however as both a challenge and an opportunity. Within each of the four Regeneration Areas further detail is subsequently given of their unique features which include environmental concerns.

As such Volume 1 sets the background against which the LRFIP will proceed and does not contain specific objectives or policies that may result in effects to the Natura 2000 network.

Volume 2

Volume 2 sets out the vision of the LRFIP in terms of the physical, social and economic pillars that require intervention. Priority themes are defined and include: education & training; health & well-being; employability & work; and families & youth at risk. Much of this section of the plan sets priorities for further action but does not relate to specific activities that may affect the Natura 2000 network.

In terms of the physical pillar of the LRFIP nine strategic objectives are given:

- 1. Build a strong, competitive economy
- 2. Promote healthy communities
- 3. Require good design
- 4. Promote sustainable movement
- 5. Deliver a wide choice of high quality homes
- 6. Deliver a positive multidisciplinary approach
- 7. Support high quality communications infrastructure
- 8. Meet the challenge of climate change and flooding
- 9. Conserve and enhance the natural environment
- 10. Conserve and enhance the historic environment

In relation to biodiversity there are a number of these and are in relation to the level of enhancement to areas of high landscape value for e.g. by the river Shannon and Abbey river; the promotion and retention of existing trees, where possible and practicable; remediating, mitigating and monitoring contaminated and unstable land, where appropriate in line with EPA guidance and the net gain/loss in biodiversity.

These targets relate to all four Regeneration Areas and cannot be considered to have effects upon the Natura 2000 network. The Volume goes on to discuss the measures to be undertaken in each of the four areas and here site specific measures are proposed. For ease of interpretation these are also presented graphically.

Note: This section of the NIS does not reproduce every strategy objective contained within the LRFIP. Instead it focuses on the land use changes that may arise as a result of the LRFIP. It particularly focuses on open space strategies in Moyross and St. Mary's Park as these are the areas directly adjacent to the Lower River Shannon SAC.

Moyross

The Open Spaces strategy contains the following objectives:

- 1. Protect and enhance the special landscape character and setting of Delmege Estate.
- 2. Explore the potential for an ecologically sensitive leisure uses as part of a strategic linear park from the river Shannon, through the heart of Moyross to Caherdavin.
- 3. Promote the development of job opportunities around the area of sports ground maintenance and local sports facility development.
- 4. Provide opportunities for increased community interaction by encouraging local management of

open space.

- 5. Promote the retention of existing trees on proposed sites for development.
- 6. Implement a programme of street tree-planting within the private curtilage of homes to ensure better management of the tree stock.

13

- Minimise run-off to the existing drainage infrastructure through the integration of Sustainable Urban Drainage System (SUDS) technologies on a site-by-site basis as appropriate, i.e. swales, porous paving etc.
- 8. Enhancing biodiversity through habitat improvements, compensatory habitat and native planting strategies within Moyross
- 9. Retain the existing active playing pitches associated with LIT, St. Nessan's Community College and Thomond Park RFC as sporting facilities.
- 10. Restrict development of the landfill sites at Long Pavement Road.
- 11. Provide for active playspace facilities, based on the existing and expected child population projections generated by the existing and future need.

Item no.2 here would bring impacts close to the River Shannon SAC however the location of lands for this use, while as yet undefined, are unlikely to pass through the SAC itself.

The map meanwhile highlights the flowing actions:

- Create a new street between Cosgrave Park and Maintenance Depot to eliminate existing cul-desac layout.
- 2. Strengthen Watch House Cross as a mixed-use District Centre and improve access from Ballynanty
- 3. Creation of a new link between LIT and the District Centre at Watch House Cross
- 4. Improved access from the Civic Heart of Moyross to Thomond Park/Cratloe Road
- 5. Provide access between the Civic Heart of Moyross and Cratloe Road
- 6. Provide access between Moyross Avenue and Cratloe Road
- 7. Upgrade existing Moyross Avenue to include crossing facilities, landscaping, traffic calming measures and on street parking
- 8. Create a new linear park
- 9. Improved existing access from Moyross to Cratloe Road
- 10. Provide for well-designed housing that address

current and future needs

- 11. Major new entrance to Moyross to eliminate existing cul-de-sac layout
- 12. Extend existing Moyross Avenue to link with proposed Limerick Northern Distributor Road
- 13. Proposed sites for housing

- 14. Creation of a safe pedestrian/cycle link from Sarsfield Gardens through existing bridge underpass to Moyross Avenue
- 15. Reinforce existing community hub by improving the quality and extending the choice of uses available
- 16. Reinforce existing Employment & Enterprise Uses at Moyross Enterprise Centre

As can be seen from figure 6 none of these proposals will physically infringe upon areas within the Lower River Shannon SAC.



Figure 6: Location and description of actions in the physical realm in Moyross. A small area of SAC can be seen near the Watch House Cross, remaining areas of SAC are outside this view

O'Malley Keyes

- 1. Create a better connection to the heart of Southill
- 2. Redevelop existing road between Keyes and Kincora Park as a Street
- 3. St. Kieran's Integrated Educational Campus
- 4. New entrance from Childer's Road to O'Malley Park
- 5. Demolition and refurbishment of boarded houses
- 6. Proposed location for new build in short term (approval granted)

- 7. Home for home in areas proposed for demolition
- 8. Creation of new community park/square
- 9. Open up back alleys where possible
- 10. Existing homes for retention to be refurbished
- 11. Potential new streets

None of these areas is close to the Lower River

Shannon SAC.



Figure 7: Location and description of actions in the physical realm in O'Malley Keyes

Kincora and Carew Parks

The Movement and Connectivity Strategy contains the following objectives:

- 1. Improve orientation of housing to improve natural surveillance
- 2. Better connections to Kincora/Carew Park
- 3. Redevelop existing road between Keyes and Kincora Park
- 8. Open up back alleys where possible

5.

7.

Better Connections from Kincora/Carew Park

- 9. Potential for new streets and shared spaces
 - 10. Home for home in areas proposed for demolition

6. Existing homes for retention to be refurbished Creation of a new community park

Provide for visible and secure car parking facilities

11. Proposed new locations for new build

4. Introduce chicanes to slow down traffic

12. Ensure better lighting and secure location of CCTV cameras

O Improve orientation of housing to increase natural BRedevelop existing road between Keyes and Kincora Park a street surveillance GALVONE INDUSTRIAL ESTATE TO ROXBORC MALDRON LED HOTE HOGAN PARK SOUTHIL Creation of a new Community Park Introduce chicanes to slow down traffic Home for Home in areas proposed for demolition SProvide for visible and secure car-Open up back alleys where possible Proposed locations for New Build parking facilities Potential for new streets and shared spaces Ensure better lighting and selective location of New Streets 6 Existing homes for retention to be refurbished CCTV cameras Opening up of Back Alleys Proposed sites for New Build KINCORA AND CAREW PARK | PUBLIC INFORMATION SESSION | MARCH 2013 PROPOSALS FOR REDEVELOPMENT New Community Park

Figure 8: Location and description of actions in the physical realm in Kincora and Carew Parks

St. Mary's Park

The Movement and Connectivity Strategy contains the following objectives:

- Examine options to improve permeability and connections from St. Mary's Park to its wider context at the following locations, whilst ensuring protection of the integrity of the environmentally designated sites:
 - a. At Island Road: to improved connectivity from St. Mary's Park to the Medieval Quarter by transforming from a route that is predominantly designed for the movement of vehicles to a traffic calmed street where the needs of pedestrians, cyclists and public transport users are prioritised. Measures to balance the needs of different street users, for example the narrowing of carriageways, the redesign of major roundabout at Island Road and side road entry treatments, will be incorporated to improve safety for all road users;
 - b. From the northwest of St. Mary's Park to the New Road, Thomand Park and beyond.

It also includes a land use map for connectivity which indicated potential connections at the north-west and the south-east of the island.

The Open Space Strategy contains the following objectives:

- Protect and enhance the special landscape character and setting of the Special Area of Conservation(SAC) and in particular the extensive area of SAC to the north east of the island.
- 2. Restrict development on the strip of land east of St. Munchin's Street which was used as a landfill site and filled with domestic refuse.
- 3. Return the eastern side of St Munchin's Street to parkland once demolition of the area has taken place.
- Provide opportunities for increased community interaction and employment by encouraging local management of open space.
- 5. Promote the retention of existing trees at the following locations, where possible and practicable: significant tree groups to the north west and eastern boundaries of St Mary's Park; within the Military Graveyard; along George's Quay; at Merchant's Quay.
- 6. Implement a programme of street tree-planting



Figure 9: Land use connectivity map for St. Mary's Park

within the private curtilage of new and refurbished homes to ensure better management of the tree stock.

- Minimise run-off to the existing drainage infrastructure through the integration of Sustainable Urban Drainage System (SUDS) technologies on a site-by-site basis as appropriate, i.e. swales, brown roofs, porous paving etc.
- 8. Retain and upgrade the following active recreation facilities: Star Rovers Football Club; Athlunkhard Boat Club; Handball Alley to the north of St Mary's Park.
- 9. Explore the potential to upgrade Eel's Weir to provide a cycle and pedestrian link to the New Road and beyond.
- 10. Provide opportunities to maximise the educational value of the passive open space surrounding St Mary's Park. There is ample provision of passive open space in St Mary's Park at present, much of which is environmentally designated as an SAC. However the majority of the passive space remains underutilised. There exists opportunities to develop environmental awareness and training programmes as part of an economic and tourism strategy for the area. Care should be taken not to negatively impact on the natural hydrology of the designated SAC.
- Provide for active play space facilities, based on the existing and expected child population projections generated by the existing and future need. St

Mary's Park is under resourced in terms of active play facilities.

- 12. Protect and enhance the existing biodiversity value of St Mary's Park by ensuring that proposed open space and built development proposed protects and enhances areas of biodiversity value with the view to achieve an overall net gain in biodiversity.
- 13. Manage the existing and future flood risk to St Mary's Park by: protecting the integrity of the existing flood defences and embankments; incorporate flood resistant and flood resilient measures appropriately; utilise sustainable urban drainage systems (SUDS); establish flood warning and emergency procedures



Figure 10: Location and description of actions in the physical realm in St. Mary's Park and King's Island

The importance of the SAC is clearly identified in these objectives although actions no.3, 8, 9, 10 could directly affect sensitive habitats.

Meanwhile on the map the following actions are identified:

- 1. Provide a new bridge link across the river Shannon to New Road .
- 2. Home for Home within parish (restricted to proposed sites for replacement housing) in areas proposed for demolition.
- 3. Convert area proposed for demolition to parkland once remediated.
- 4. Upgrade existing water network in St. Mary's Park. Environmental improvements to the streetscape

will be developed in tandem with upgrade works.

- 5. Retain and upgrade to facilitate local sports clubs.
- 6. Develop Sheep Street/Athlunkhard Street site for
- replacement housing.
- 7. Develop small infill scheme at Gaol Lane.
- 8. Refurbish 3 vacant houses at Gaol Lane.
- 9. Potential site for replacement housing and ground floor retail/commercial at Bridge St.
- 10. Proposed site for elderly housing at Googoos Hill.
- 11. Provide for a new link to Verdant Place.
- 12. Redesign Island Road as a street (traffic calming, pedestrian priority).
- 13. Reinforce existing community hub by improving the quality and extending the choice of uses available.

- 14. Existing homes for retention to be refurbished.
- 15. Upgrade existing bridge for pedestrian use

Items no.1, 3, and 5 propose developments that will intrude on areas that are either within, or adjacent to sensitive areas of SAC.

Ballinacurra Weston

- 1. Ensure optimum location of street lighting and CCTV cameras
- 2. Take houses out of dereliction
- 3. Potential for new street from Beechgrove Ave. to Crecora Ave.
- 4. Area for long term redevelopment
- 5. Remove the community wall to the side of the



Figure 11: Location and description of actions in the physical realm in Ballincurra

Church to allow both physical and visual access.

- 6. Construct a new path between the Church and Crecora Ave.
- 7. Home for home in areas proposed for demolition.
- 8. Proposed location for new build in medium to long term.
- 9. Existing home for retention to be refurbished.
- 10. Potential for new streets.
- 11. Potential for new playground.
- 12. Infill sites available for new-build in the medium to long-term.

None of these areas is close to the Lower River Shannon SAC.

Volume 3

Volume 3 of the LRFIP describes the implementation and delivery of the objectives that were described in Volume 2. Its sets evaluation indicators so that the implementation of the Plan can be objectively evaluated. In this way it does not add anything new to the Plan and does not affect the Natura 2000 network directly.

4.0 Step 3 – Analysis of Other Plans

Individual impacts from one-off developments or plans may not in themselves be significant. However, these may become significant when combined with similar, multiple impacts elsewhere. These are sometimes known as cumulative impacts but in AA terminology are referred to as 'in combination' effects.

The lower river Shannon SAC is a very large site, mostly aquatic or marine in nature, that stretches from upstream of Limerick city towards the Atlantic ocean as far as a line between Loop head in county Clare and Kerry head in county Kerry.

In terms of the conservation objectives of the site identified in section 2.2, maintaining good water quality throughout the catchment is of prime importance. In this context, the SAC is a part of the Shannon river basin, the largest river basin in Ireland and draining a significant portion of the island.

The following known plans or proposed projects have been considered for this assessment:

4.1 River Basin Management Plan for the Shannon International River Basin District.

The overriding purpose of this plan is to achieve 'good ecological status' of all waters by 2015 in accordance with the EU Water Framework Directive. The plan identifies bodies of water that do not meet satisfactory standards and proposes a 'programme of measures' to improve this status. The implementation of this plan will result in the long-term improvement of water quality (as well as addressing artificial modifications to the river and barriers to fish passage) and consequently the conservation status of SAC's qualifying interests.

4.2 Limerick City Development Plan 2010 – 2016

The latest Development Plan for the city gives full backing to the Regeneration Agencies and supports the aims of the Framework Plans for each of the Regeneration Areas.

The Plan emphasises the importance of Natura 2000 sites for the city's natural heritage and states that an 'appropriate assessment' will be required where a project or plan is likely to result in a significant effect upon the integrity of any SAC or SPA.

4.3 Limerick City Biodiversity Plan

In January 2012 Limerick City published its first

biodiversity plan. It emphasises the importance of locally important habitats and highlights actions to persevere wetlands and control invasive species (among others).

It should also be noted that impacts from activities such as increasing loadings on wastewater treatment plants, extraction of water for drinking and other uses, conversion of 'green' land to sealed concrete (thereby affecting the quality and quantity of surface water run-off) and the spread of alien invasive species can all act in a cumulative manner to result in potentially significant effects to the Natura 2000 network.



5.0 Step 4: Determination of Significance

5.1 Impact prediction

The scope of this NIR considers the impacts to the Natura 2000 network and not necessarily to biodiversity in general. Under Article 6 of the Habitats Directive the term 'significance' is taken to mean an effect on the integrity of the SAC. Unlike Environmental Impact Assessment for instance, there are no degrees of significance, and where an effect is determined to be significant, mitigation or avoidance measures must be considered.

It must also be noted that this is a strategic document. This NIR does not negate the need for further studies under Article 6 of the Habitats Directive at the project planning stage.

When assessing whether an effect from the LRFIP is likely to impact upon a Natura 2000 site it is important to establish the pathway between the source and receptor. Where a pathway does not exist an impact cannot occur.

This assessment has found that there are seven SACs and one SPA within 15km of the Plan boundary. The majority of these are physically remote from the Regeneration Areas. It was found that pathways for impacts to occur only exist for the Lower River Shannon SAC and the River Fergus Estuary SPA. All other SACs can be screened out at this stage.

The following impacts are considered:

5.1.1 Impacts to habitats and species within the Lower River Shannon SAC from the demolition of existing housing and infrastructure at St. Mary's Park

All existing housing and infrastructure is located outside the SAC boundary. There are no plans to interfere with the embankment encircling the island. All construction and demolition waste will be disposed of by an EPA licensed contractor and in accordance with all relevant waste legislation. Demolition machinery will not infringe on land within the SAC boundary at any time and this boundary will **be clearly marked to on-site contractors**.

The wetland within the SAC boundary is maintained due to an artificial enclosure with the embankment on one side and a combination of housing and heaped spoil on the other. This area functions within the SAC as part of the Shannon's floodplain and clearly this function will be maintained within the current design. The wetland habitat exists because of the current hydrological regime and the removal of roads, housing foundations and subterranean infrastructure close to the wetland may result in a redistribution of water in this sensitive area. If so the nature of this habitat could change, e.g. through a change in species composition as a result of a lower water table. The presence of birds in the area, especially the Whooper swans, is due to a combination of available food and a lack of disturbance. In a 'lower water table' scenario this area may become more accessible by people and predators (e.g. foxes), thereby driving the birds away. This outcome would be undesirable given that one of the conservation objectives of the SAC is to maintain populations of species that are typical of that habitat. The impact can therefore be considered to be significant.

However this impact is unlikely to impact upon bats, opposite-leaved pondweed, or kingfisher since works will not affect river habitats. Otters may be impacted if they are using the wetland (as such a loss of wetland would represent a loss of habitat for Otter).

5.1.2 Construction impacts to habitats within the Lower River Shannon SAC from new housing, demolition and other built developments.

All proposed housing projects are well away from the SAC with the exception of those on St. Mary's Park. Any construction project will comply with the Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites published by the Eastern Regional Fisheries Board (currently Inland Fisheries Ireland).

- 1. Fuels, oils, greases and hydraulic fluids must be stored in bunded compounds well away from the watercourse. Refuelling of machinery, etc., should be carried out in bunded areas.
- 2. Runoff from machine service and concrete mixing areas must not enter the watercourse.
- 3. Stockpile areas for sands and gravel should be kept to minimum size, well away from the watercourse.
- 4. Runoff from the above should only be routed to the watercourse via suitably designed and sited settlement ponds/filter channels.
- 5. Settlement ponds should be inspected daily and maintained regularly.
- 6. Temporary crossings should be designed to the

criteria laid down for permanent works [not relevant in this case].

7. Watercourse banks should be left intact if possible. If they have to be disturbed, all practicable measures should be taken to prevent soils from entering the watercourses. [not relevant as riparian habitat is to be retained].

The full text of this document is available at: http://www.fishingireland.net/environment/fullconst ructionanddevelopment.htm

A method statement will be prepared and supplied to the ShRFB well in advance of commencing works at the site. This should provide details of how these guidelines, and in particular points number 1, 4 and 5, will be implemented on the site to the satisfaction of the fisheries board.

Impacts to water bodies are of a temporary nature and can be avoided through good site management practices as described.

This impact is therefore **not significant**.

5.1.3 The direct loss of habitat and habitat fragmentation within the SAC from the potential connectivity links.

The LRFIP envisages a total of two new bridges to connect the island to the surrounding city. Another bridge will effectively be created through the upgrading of the existing Thomond weir across the Shannon. The two new connections are proposed to include vehicle, pedestrian and cycle access.

Specific locations have not yet been proposed for these bridge connections. It must be noted that any loss of alluvial woodland habitat (see figure 2) will require an application to the Department of Arts, Heritage and the Gaeltacht and the European Commission under Article 6(4) of the Habitats Directive which allows for projects to proceed under Imperative Reasons of Overriding Public Interest. This process also requires that all alternative options be investigated and options are available in these locations to avoid this sensitive habitats. Any application under this Article must also be accompanied by the creation of compensatory habitat.

These connections also have the potential to disturb habitat for key species such as Otter, Kingfisher, Bats

and Whooper Swan. Opposite-leaved Pondweed is not present in this area but the Triangular Clubrush is.

The alien invasive Japanese Knotweed and Giant Hogweed are present throughout this area. Works therefore risk spreading these species. This impact is considered significant.

Bridges can be planned and designed in such as way as to minimise impacts to the riparian zone and so each must be evaluated at a project level. Nevertheless they have the potential to result in habitat loss and pollution at the construction stage while also leading to fragmentation of habitats during the operation phase. For these reasons this impact must be seen as **significant**.

5.1.4 Impacts arising from the disturbance of alien invasive species (AIS)

Japanese Knotweed and Giant Hogweed were recorded from throughout the St. Mary's Park/King's Island area. AIS can affect the conservation of habitats within the Lower River Shannon by impacting upon the structure and function of these habitats. Their spread is facilitated by disturbance as small fragments regenerated into new plants. This impact is therefore **significant**.

5.1.5 Impacts to water quality from the operation phase of the LRFIP

- a. Foul sewage will be piped to the main Limerick wastewater treatment facility at Bunlicky. This facility was recently completed as part of the Limerick Main Drainage project and has ample capacity to deal with the projected future growth of the city. This impact is **not significant**.
- b. The LRFIP envisages that Sustainable Drainage System (SUDS) will be incorporated into all built developments. This will reduce pollution entering the Shannon as well as helping to alleviate flooding. This effect is **not significant**.

Because of these factors there can be no impact to the Lower River Shannon SAC or the River Fergus Estuary SPA from the Regeneration Areas of Southill and Ballinacura. These areas can be screened out at this stage.

5.1.6 Potential disturbance effects from the development of a linear park near Moyross; the enhancement of the Athlunkard Boat Club; the

pedestrianisation of the Thomond weir and the development of awareness raising/environmental training programmes at St. Mary's Park.

Under the Planning and Development Act all developments must be screened for 'appropriate assessment' Any proposal for a linear park linking Moyross with the River Shannon and on to Caherdavin or other projects on the River Shannon will be screened for appropriate assessment and be accompanied by a detailed survey of the affected area. For this reason it is considered that these impacts are **not significant**.



6.0 Avoidance or Mitigation

Potential significant effects must be avoided or mitigated in order to maintain the integrity of the Lower River Shannon SAC and the River Fergus Estuary SPA. Where this is not possible, development can only proceed for Imperative Reasons of Overriding Public Interest (IROPI). This must be done in consultation with the Minister for the Environment, Heritage and Local Government, be accompanied by compensatory measures to maintain the overall coherence of the Natura 2000 network, and can only proceed with the approval of the European Commission. In addition, it must be demonstrated that all alternative options have been considered – including not proceeding with a plan at all.

In the case where significant effects are likely to occur to a priority habitat, the plan can only proceed for reasons of human health and safety, where there are important environmental benefits, or other IROPI. Again, compensatory measures will be required and the Commission must be informed.

Section 5.0 assessed seven potential impacts and these are summarised in table 7 below. Therefore, four significant impacts remain.

6.1 Impacts to habitats in the Lower River Shannon SAC arising from the removal of housing foundations, roads and subterranean infrastructure at St. Mary's Park

The impact here arises due to the potential for hydrological changes to occur within areas that are currently wetland. It is important that water is not drained from the wetland as a result of this phase. Figure 12 shows data on the topography of the St. Mary's Park area including contour lines. It shows that land levels in the wetland (2m) are roughly half that of the rest of the northern portion of King's Island (4m). For hydrology to change the demolition works would need to lower the current land level by over 2m. This will not occur from the demolition of individual



Figure 12: Topographic levels to the north of King's Island

	Impact	Assessment
1	Impacts to habitats in the Lower River Shannon SAC from the demolition of existing housing and infrastructure at St. Mary's Park	Significant
2	Construction impacts to habitats in the Lower River Shannon SAC from new housing and other built developments	Not significant
3	The direct loss of habitat and habitat fragmentation within the SAC from the construction of transport corridors.	Significant
4	Impacts arising from the disturbance of alien invasive species (AIS)	Significant
5a	Impacts to water quality from the operation phase of the plan (foul run-off) affecting both the Lower River Shannon SAC and the River Fergus Estuary SPA	Not significant
5b	Impacts to water quality from the operation phase of the plan (surface water run-off) affecting both the Lower River Shannon SAC and the River Fergus Estuary SPA	Not significant
6	Potential disturbance effects from the development of a linear park near Moyross; the enhancement of the Athlunkard Boat Club; the pedestrianisation of the Thomond weir and the development of awareness raising/environmental training programmes at St. Mary's Park.	Not significant

Table 7: Summary of impact assessment

houses and so may only occur through the excavation of house foundations, roads or subterranean infrastructure.

Recommendation 1

To ensure this does not occur a project level NIS should be completed for this aspect of the demolition phase.

6.2 The direct loss of habitat and habitat fragmentation within the Lower River Shannon SAC from the construction of transport corridors

The design and precise location of the bridges will be critical to determining whether significant impacts occur to the Lower River Shannon SAC. The preservation of alluvial woodland will be of paramount importance.

Recommendation 2

In the first instance a Natura Impact Statement must be prepared at the project stage for each bridge and should commence at the earliest design stage. Where significant effects are predicted to occur alternative routes and the need for the bridge should be examined. In all cases a single span bridge should be used so that the riparian zone can be preserved or reinstated postconstruction. Alternatives to concrete abutments should be examined, including the use of erosion resistant coconut shell gabions which allow for the regeneration of vegetation (or similar 'green gabions'). The removal of trees along the riparian zone should be minimised to the greatest degree possible. All bridges should allow for Otter underpasses (consisting of a ledge or similar of at least 500cm wide) (see NRA, unknown year). During the construction stage IFI guidance should be followed to ensure pollution does not occur while consultation with IFI personnel will be essential from the earliest possible stage.

It must be stressed that any loss of alluvial woodland would require the project to proceed as IROPI under Article 6(4) of the Habitats Directive.

6.3 Impacts arising from the disturbance of alien invasive species

AIS are currently known only from the western banks of the River Shannon as shown in figure 2.

Recommendation 3

This recommendation is given in accordance with guidance from the UK's Environment Agency (Environment Agency, 2006) however it is essential

that personnel experienced in the use of herbicides and the treatment of Japanese Knotweed be engaged for this task. [note that although Giant Hogweed is present in this area also Japanese Knotweed is by far the more dominant of the two. This treatment will also be effective for Giant Hogweed].

The stands of emerging Japanese Knotweed should be treated as soon as possible with Glyphosate herbicide. Care should be taken to direct herbicides at the target and particularly to keep it away from water courses. Repeat treatments are needed annually for at least three years and perhaps longer.

Where development needs do not allow this, the stand should be treated as soon as possible following by these steps:

Any visible stands of Japanese Knotweed should be removed along with the rhizomes (underground stems) from which they arise. Rhizomes are normally confined to the top 25cm of soil but can extend to 3m deep and 7m away from visible shoots. The ground can be raked to remove as much rhizome as possible.

The contaminated material must then be stored in bunded area (i.e. above a surface through which roots cannot penetrate) for a period of two years. This soil should not be more than 1m deep but 50cm is preferable. Visible re-growth should be re-treated with Glyphosate.

It is illegal to send soil contaminated Japanese Knotweed to landfill or off site without a waste permit. Inappropriate treatment can lead to the spread of the plant, which can regenerate from fragments as small as 1cm.

Because of the risk of rhizomes remaining in the original location, the ground must be monitored at least annually for recurrence of the weed.



7.0 Conclusion

The LRFIP (June 2013) was assessed as per Article 6 of the Habitats Directive. This study found that there are a number of aspects of the plan which, either alone or in combination with other plans and developments, may result in significant effects to the integrity of the Lower River Shannon SAC. These include: the reconfiguration of land to the north of the island, disturbance to birds as a result of potential amenity use of lands within the SAC; the potential loss and fragmentation of habitat resulting from the construction of connecting bridges; and the spread of alien invasive species.

In each case it is considered that the impacts can be mitigated through avoidance by careful plan and design of the final projects as well as site treatment in the case of alien invasive species. With the implementation of these measures the elements of the draft Framework Plan can be achieved without resulting in significant effects to the Natura 2000 network.

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Appendix 1 – Species lists for surveyed habitats

The nomenclature for vascular plants is taken from the Census Catalogue of the Flora of Ireland (Scannell & Synnott, 1987) (common names) and An Irish Flora (Webb et al., 1996) (Latin names).

These data are combined from surveys undertaken by OPENFIELD in January 2010 but also from the preexisting report from Mr Roger Goodwillie.

Species indicated with an '*' are certainly introduced by man

Wet grassland - GS4

Phalaris arundinacea	Reed canary-grass
Ranunculus repens	Creeping buttercup

Tall herb swamp - FS2	
Agrostis stolonifera	Creeping bent
Alisma plantago-aquatica	Water plantain
Alnus glutinosa	Alder
Apium nodiflorum	Fool's water-cress
Callitriche sp.	Water-starwort
Caltha palustris	Marsh-marigold
Cardamine pratensis	Cuckooflower
Carex nigra	Common sedge
Carex rostrata	Bottle sedge
Eleocharis palustris	Common spike-rush
Equisetum sp.	Horsetail
Galium palustre	Common marsh-bedstraw
Glyceria declinata	Small sweet-grass
Glyceria maxima	Reed sweet-grass
Hydrocotyle vulgaris	Marsh pennywort
lris pseudacorus	Yellow iris
Juncus articulatus	Jointed rush
Lemna sp.	Duckweed
Lysimachia nummularia	Creeping-jenny
Lythrum salicaria	Purple-loosestrife
Myosotis laxa	Tufted forget-me-not
Myosotis scorpioides	Water forget-me-not
Oenanthe fistulosa	Tubular water-dropwort
Polygonum persicaria	Redshank
Ranunculus flammula	Lesser spearwort

Tall herb swamp - contd.	
Ranunculus repens	Creeping buttercup
Rorippa amphibia	Great yellow-cress
Rorippa palustris	Marsh yellow-cress
Rumex conglomeratus	Clusterd doc
Rumex crispus	Curled dock
Salix cinerea	Grey willow
Salix triandra§§	Almond willow
Salix viminalis*	Osier
Sparganium erectum	Branched bur-reed
Typha latifolia	Bulrush
Typha sp.	Bulrush
Veronica catenata	Pink water-speedwell
Veronica scutellata	Marsh speedwell

Drainage ditches - FW4	
Acer pseudoplatanus*	Sycamore
Angelica sylvestris	Wild angelica
Bellis perennis	Daisy
Fraxinus excelsior	Ash
Ranunculus repens	Creeping buttercup
Rubus fruticosus	Bramble
Rumex sp.	Doc
Salix sp.	Willow
Urtica dioica	Common nettle

Riparian woodland - WN4	
Allium triquetrum*	Three-cornered leek
Alnus glutinosa	Alder
Angelica sylvestris	Wild angelica
Cardamine flexuosa	Wavy bitter-cress
Carex pendula	Pendulus sedge
Cochlearia anglica	English scurveygrass
Equisetum sp.	Horsetail
Filipendula ulmaria	Meadowsweet
Fraxinus excelsior	Ash
Glyceria maxima	Reed sweet-grass
Heracleum mantegazzianum*	Giant hogweed
Impatiens glandulifera*	Indian (Himalayan) balsam
Iris pseudacorus	Yellow iris
Juncus effusus	Soft rush
Juncus inflexus	Hard rush
Leucojum aestivum	Summer snowflake
Lythrum salicaria	Purple-loosestrife
Mentha aquatica	Water mint
Nasturtium officinale	Water-cress
Oenanthe crocata	Hemlock water-dropwort
Salix alba*	While willow
Salix cinerea	Grey willow
Salix fragilis*	Crack willow
Salix purpurea§	Purple willow
Salix sp.	Willow

Riparian woodland - WN4 - contd.		
Salix triandra§§	Almond willow	
Salix viminalis*	Osier	
Schoenoplectus lacustris	Common club-rush	
Scrophularia auriculata	Water figwort	
Scrophularia nodosa	Common figwort	
Urtica dioica	Common nettle	
Valeriana officinalis	Common valerian	

Recolonising bare ground - ED2	
Bellis perennis	Daisy
Buddleja davidii*	Butterfly-bush
Calystegia sepium	Hedge bindweed
Centranthus ruber*	Red valerian
Cirsium vulgare	Spear thistle
Poa trivialis	Rough meadow-grass
Potentilla anserina	Silverweed
Reynoutria japonica*	Japanese knotweed
Rubus fruticosus	Bramble
Rumex conglomeratus	Clusterd doc
Rumex sp.	Doc
Scrophularia auriculata	Water figwort
Senecio aquaticus	Marsh ragwort
Sisymbrium officinale	Hedge mustard
Urtica dioica	Common nettle
Veronica beccabunga	Brooklime

Appendix 2 – DAU response



An Roinn Ealaíon, Oidhreachta agus Gaeltachta Department of Arts, Heritage and the Gaeltacht

8th March 2012

Your Ref: St Marys Park AA Our Ref: DAU-2012-LI-CON-G Pre00010/2012

Padraic Fogarty, Openfield Ecological Services, 12, Maple Avenue, Castleknock, Dublin 15

Re: AA Screening for a framework plan for the St. Mary's Park/King's Island area of Limerick City

A Chara,

I refer to refer to your letter of 6 January 2012, and accompanying map, requesting observations on a Screening for Appropriate Assessment Report for the above plan.

In the context of the provisions of the Planning and Development (Amendment) Act 2010, which have come into force last autumn, please note that the Planning Authority will be carrying out the assessments of this proposed plan, and they should be consulted in the first instance. We have therefore copied the Planning Authority with your correspondence and our response. The observations below is without prejudice to any recommendations, decisions or actions by either the Planning Authority or the Minister for Arts, Heritage and the Gaeltacht relating to this plan, subsequent planning applications or to further draft plan consultations.

The proposed plan area is within and adjacent to the Lower River Shannon candidate Special Area of Conservation (cSAC) (2165), designated under the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997) (as amended). The following habitat types and species, listed in Annexes I and II of the EC Habitats Directive (Council Directive 92/43/EEC), are of particular conservation importance in this part of the cSAC: Alluvial woodland, sea lamprey, river lamprey, salmon, otter.

It is also important that any developments on or adjacent to the river do not adversely affect the ecological structure and function of the river, or cause a barrier to species movement, insofar as this might affect the habitats and species for which the cSAC is designated.

Appropriate assessment

Given the scale of the development, the provision for three new river bridge crossings, a marina, a flood defence system and extensive demolition and reconstruction of the area, there are likely to be significant effects on the cSAC in the absence of mitigation (siltation, pollution, disturbance, change in flood regime, etc.), and an appropriate assessment is very probably necessary. Please confirm this with the planning authority. Detail necessary in Natura Impact Report

A Natura Impact Report will need to be produced to inform an appropriate assessment (see Appendix 1). Because the Framework Plan map includes specific locations for bridge crossings, a marina, housing and a wetland, a detailed site-specific assessment will be necessary. Given this, it may be necessary to do a project-type assessment (with site survey) of the components of the development insofar as design options can be known at this stage.

The following questions will, inter alia, need to be addressed:

- Will there be direct or indirect loss of habitats for Annex I or II habitat types or species?
 Will there be direct or indirect effects on water quality as a result of the demolition or construction associated with the plan?
- (3) Are there any contaminated or hazardous waste sites in the area of the plan, which could cause deterioration in water quality if disturbed during demolition or construction?
- (4) What will be hydrological impacts of implementing the plan be? Will there be changes in flood regime?
- (5) What will the effects in combination with other plans and projects in the Limerick City area?
- (6) Are their breeding otters in or near the area which would be susceptible to disturbance as a result of the implementation of the plan?
- (7) What guidance for siltation, pollution and invasive species control will be followed in implementing the plan?
- (8) To what extent will the principles of SUDS be adopted in the plan? The wording used for SUDS in the draft South Hill/Ballinacurra Masterplan (September 2008) should be used in this plan, but sufficient spaces must be allowed to ensure SUDS is feasible.

Protected Species

In addition to the assessment of potential impacts on European sites, the presence of protected species should be noted and impacts on these considered. Particular attention should be given to the following:

- (a) Opposite leaved pondweed (Groenlandia densa) (listed on the Flora Protection Order under the Wildlife Acts of 1976-2010) occurs in the Limerick Canal;
- (b) Whooper swans (listed on Annex I of the Birds Directive) are known to use the area;
- (c) Kingfisher (listed on annex I of the Birds Directive) are very likely to use the area;
- (d) Bat species (all bat species are protected by the Wildlife Acts of 1976-2010 and are listed on Annex IV of the Habitats Directive). Daubenton's bats are very likely to use the area and have been recorded less than 1km from the plan area.

Kindly forward any further information to the following address:

The Manager, Development Applications Unit, Department of Arts, Heritage and the Gaeltacht, Newtown Road, Wexford

Alternatively, documentation associated with the above can be referred electronically to the DAU at the following address:

manager.dau@ahg.gov.ie

Finally, the above observations and recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in his role as statutory consultee under the Planning and Development Act 2000, as amended.

Is mise le meas,

Gronne Nolar

Yvonne Nolan, Development Applications Unit Tel: (053) 911 7382 E-mail: <u>yvonne.nolan@ahg.gov.ie</u>

c.c. Planning and Economic Development Department, Limerick City Council, 1st Floor, City Hall, Merchants Quay, Limerick