

Quinn's Cross to Raheen Roundabout Cycle Scheme, Raheen, Co. Limerick



Screening for Appropriate Assessment

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EXECUTIVE SUMMARY

The current document provides a Screening for Appropriate Assessment for a proposed development on the R510 in the Raheen / Dooradoyle area of Limerick. This report assesses whether the proposed development is likely to have a significant effect on the Natura 2000 site network; and thereby determines if a Natura Impact Statement is required for the proposed project.

The development site comprises a c 1.1km stretch along the existing road corridor from Quinn's Cross to the Raheen Roundabout. The current traffic levels on the road are high and the road is considered to be unsafe for cyclists. The proposed project is for the slight reduction of the road carriageway width and the construction of off-road cycle tracks with improved road accesses and crossing points.

The proposed development site is located to the south of the main channel of the River Shannon, south-east of Limerick City. There are 6 designated Natura 2000 sites within a 15km radius of the proposed development; 2 of which are within 5km of the development. The nearest Natura 2000 site is the Lower River Shannon SAC (002165) which is c. 1.4km north-east of the proposed cycle scheme at the closest point on the SAC boundary. The River Shannon and River Fergus SPA (004077) is next closest, located c. 1.5km north of the site. The current screening assesses the 6 designated sites within the 15km radius and their qualifying interests in terms of potential to be impacted by the proposed development.

It was found that there was no potential for the proposed cycle scheme to result in any significant impacts on any Natura 2000 sites or qualifying interests of these sites. Due to the relatively small scale of the proposed cycle facility development and its location alongside an existing road, more than 1km from any Natura 2000 sites, no adverse impacts on the Natura 2000 network is anticipated from the project. The proposed development is significantly separated from any designated sites and their qualifying interests and there are no sensitive receptors such as watercourses on-site that provide a pathway for effects. No direct impacts on Natura 2000 sites will arise due to the separation. Similarly it is considered that there is no potential for designated sites to be impacted indirectly either. Construction impacts that arise are expected to be minor and localised; no negative operational phase impacts are envisaged. The proposed development will not be adding significantly to any other impacts on any Natura 2000 sites. Specific mitigation measures to prevent significant impacts on the Natura 2000 network are not necessary for the proposed project.

From examination of the information available, it is concluded that there is no potential for direct, indirect and / or cumulative impacts arising from the proposed development between Quinn's Cross and the Raheen Roundabout. Mitigation measures are not required to protect the Natura 2000 network from adverse effects. Therefore, a Natura Impact Statement is not required for the proposed development.



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1. INTRODUCTION

Ecofact has been commissioned to carry out a Screening for Appropriate Assessment for a proposed project in the Raheen/Dooradoyle area of south-east Limerick City. The current document provides the Screening for Appropriate Assessment Report of the proposed development on the R510 between Quinn's Cross and Raheen Roundabout in Limerick. This report assesses whether the proposed development is likely to have a significant effect on the Natura 2000 network. The current document has been revisited and amended based on minor project design changes. Potential effects upon the conservation objectives and qualifying interests (including habitats and species) within affected designated areas are considered. The location of the proposed development in the context of the Natura 2000 network is presented in Figure 1, showing Natura 2000 sites within a 15km radius of the proposed development site.

Appropriate Assessment is required under Article 6 of the Habitats Directive (92/43/EEC), in instances where a plan or project may give rise to significant effects upon a Natura 2000 site. Natura 2000 sites are those identified as sites of European Community importance designated under the Habitats Directive (1992) (SACs) or the Birds Directive (2009) (SPAs). The current document meets this requirement by providing a Screening Assessment of the development and follows the guidance for screening published by the Department of the Environment, Heritage and Local Government (DoEHLG 2010) '*Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities*'.

According to DoEHLG (2010), screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the EU Habitats Directive:

- (1) Whether a plan or project is directly connected to or necessary for the management of the site, and;
- (2) Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

Screening is a pre-assessment procedure which considers whether an assessment (i.e. appropriate assessment) is required or not. A project or plan may only pass at the Screening stage if there is no reasonable scientific doubt remaining as to the absence of impacts on the Natura 2000 network. The current screening therefore sets out to determine whether the proposed project, alone or in combination with other plans and projects, is likely to have significant effects on any Qualifying Interests of the Natura 2000 sites within the study area. If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). When assessing the significance of potential effects, DoEHLG (2010) recommends that "*a precautionary approach is fundamental and, in cases of uncertainty, it should be assumed the effects could be significant*".

1.1 Legislative context

Part XAB of the 2000 Act and SI. No 477 of 2011 transpose into Irish law, Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive) and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). These Directives require Ireland to establish protected sites as part of a European wide network of sites (known in Ireland as European sites) for habitats and species that are of international importance for conservation. In Ireland, European sites include Special Areas of Conservation (SACs, including candidate SACs) and Special



Protection Areas (SPAs)". Article 6, paragraphs 3 and 4 of the EC 'Habitats' Directive (1992) state that:

The 1997 Regulations were updated in 1998 by The European Communities (Natural Habitats) (Amendment) Regulations 1998 (S.I. No. 233/1998) to include Council Directive 97/62/EC which served to update Council Directive 92/43/EEC, adapting it to technical and scientific progress made in the intervening years.

The 1997 Regulations were again updated in 2005, by The European Communities (Natural Habitats) (Amendment) Regulations 2005 (S.I. No. 378/2005). This amendment served to consolidate the main nature conservation legislation enacted in Ireland, meaning The Wildlife Act 1976, The Wildlife (Amendment) Act 2000, The European Communities (Natural Habitats) Regulations 1997, The European Communities (Natural Habitats) (Amendment) Regulations 1998, and to draw direct reference upon Council Directive (2009/147/EC) on the conservation of wild birds – '*The Birds Directive*'.

The Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs) whereas the Habitats Directive does the same for habitats and other species groups with Special Areas of Conservation (SACs). It lists certain rare habitats (Annex I) and species (Annex II) whose conservation is of community interest. It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected areas throughout the European Community.

Article 6, paragraphs 3 and 4 of the Habitats Directive state that:

'6(3) Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.'

6(4) If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.'

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.'

In case C-323/17 *People Over Wind and Peter Sweetman v Coillte*, the Court of Justice of the European Union (CJEU) ruled that mitigation measures could not be taken into account when undertaking a screening for Appropriate Assessment (AA). If mitigation measures are required to reduce or avoid a significant adverse effect, then Appropriate Assessment is required.



1.2 Consultation

The following bodies provided information for this report, via publicly available sources:

- National Parks and Wildlife Service (NPWS);
- National Biodiversity Data Centre (NBDC);
- Environmental Protection Agency (EPA).

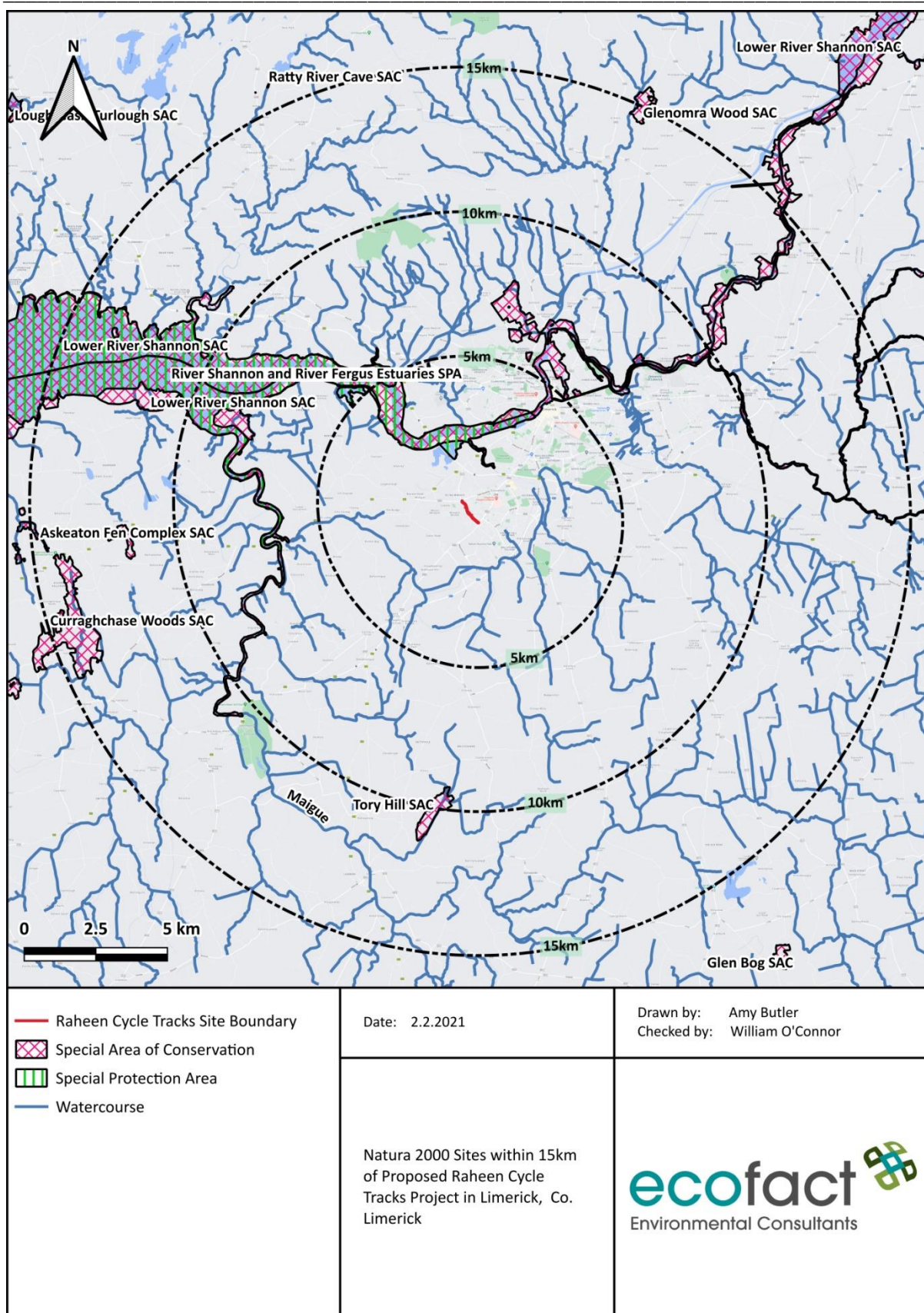


Figure 1 Natura 2000 Sites and Locations the Proposed Cycle Scheme in Raheen, Limerick.



2. METHODOLOGY

2.1 Desk study

A desktop study was undertaken to identify the extent and scope of the potentially affected designated Natura 2000 sites within the current study area in relation to the proposed development site. The desktop study identified the qualifying interests (species and habitats) relevant to the designated sites within the area.

Information sources reviewed as part of the current assessment included NPWS site synopses, as well as protected species data held on the NPWS/NBDC online databases. Scientific data on water quality and waterbodies relevant to the subject site was obtained from the websites of the EPA and catchments.ie. The conservation objectives documents as well as the conservation objectives supporting documents for Natura 2000 sites were reviewed on the NPWS website. A full bibliography of information sources reviewed is given in the reference section. Online aerial imagery was accessed to characterise the nature of proposed works locations near the Natura 2000 network.

2.2 Assessment Methodology

The European Commission Guidance 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 prescribes a staged process, as set out below, the need for each stage being dependent on the outcomes of the preceding stage.

1. Screening for Appropriate Assessment
2. Appropriate Assessment
3. Assessment of Alternative Solutions
4. Assessment where no alternative solutions exist and adverse impacts remain, i.e. the Imperative Reasons of Overriding Public Interest test, and compensatory measures

The current report is a Screening Report and therefore makes Stage One assessment only. According to DoEHLG (2010), screening can result in the following possible conclusions or outcomes:

AA is not required. Screening establishes that the plan or project is directly connected with or necessary to the nature conservation management of the site.

No potential for significant effects/AA is not required. Screening establishes that there is no potential for significant effects and the project or plan can proceed as proposed. However, no changes may be made after this as this will invalidate the findings of screening. Documentation of the AA screening process, including conclusions reached and how decisions were made, must be kept on file.

Significant effects are certain, likely or uncertain. The plan or project **must either proceed to Stage 2 (AA), or be rejected.** Rejection of a plan or project that is too potentially damaging and/or inappropriate ends the process and negates any need to proceed to Stage 2 (AA).

The safeguards set out in Article 6(3) and (4) of the Habitats Directive are triggered not by certainty but by the possibility of significant effects. Thus, in line with the precautionary principle, it is



unacceptable to fail to undertake an appropriate assessment on the basis that it is not certain that there are significant effects.

The approach to screening is likely to differ somewhat for plans and projects, depending on scale and on the likely effects. It is stated in DoEHLG (2010) that any Natura 2000 site within or adjacent to the proposed development area as well as any Natura 2000 sites within the likely zone of impact should be included for assessment. A distance of 15km is currently recommended by DoEHLG (2010) to loosely define the zone of impact in the case of plans but the distance could be much less than 15km, and in some cases less than 100m: this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects. In the case of the current project, where the proposed works are close to the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA, these Natura 2000 sites, and indeed any other Natura 2000 sites in close proximity and / or those with downstream hydrological connectivity have been considered.

When doing a screening it is ***merely necessary to determine that there may be such an effect.*** *'The threshold at the first stage of Article 6(3) is a very low one. It operates merely as a trigger, in order to determine whether an appropriate assessment must be undertaken on the implications of the plan or project for the conservation objectives of the site.'* (Finlay Geoghegan J. in *Kelly -v- An Bord Pleanála 2013/802 JR*). A significant effect is defined as "any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding de minimis or inconsequential effects" (EHS, 2002; English Nature, 2004 & 2006; Scottish Natural Heritage, 2006). Where the potential for a significant impact is identified, or if there is any uncertainty regarding an impact, then an Appropriate Assessment must be completed to assess if this effect would cause an integrity level impact. At Appropriate Assessment (NIS) stage mitigation can also be specified to reduce or avoid this effect. A screening assessment cannot replace the requirement of Appropriate Assessment so if any potential impact on qualifying interests or their habitats (e.g. siltation from works area during construction phase) is identified then Appropriate Assessment is required. Screening must be approached on a precautionary basis with the safeguards set out in Article 6(3) and (4) of the Habitats Directive triggered not by certainty - but by the possibility of significant effects.

3. DESCRIPTION OF PROJECT CHARACTERISTICS

The proposed cycle scheme is located Gouldavoher in the Raheen/Dooradoyle area. The Raheen/Dooradoyle area is a large residential area in the southwest suburbs of Limerick City. There are also a number of commercial facilities in the area including Raheen Business Park and Courtfield and Racefield Shopping Centres. There are educational facilities at St. Nessian's National School on the R510 and St. Paul's National School on St. Nessian's Road.

The proposed development site comprises the road corridor along the existing R510 regional road between Quinn's Cross and Raheen Roundabout, approximately 1.1km in length. The proposed section of the R510 is currently considered to be unsafe for cyclists and has a lack of cycle facilities. Traffic volumes at this site are high and there are multiple vehicular accesses which are designed to prioritise motorised vehicles along the proposed stretch of the road. Wide carriageway approach widths, large junction radii and wide circulating carriageway are resulting high vehicular speeds and vulnerable road user movements.

Raheen Roundabout is a busy junction with 4 arms, each with a single lane exit and 2 lane (flared or full) approaching the roundabout. There are uncontrolled, sub-standard pedestrian crossings on each



arm. The proposed development involves improved pedestrian crossings at the roundabout arms. A 4m wide zebra crossing will be located between the roundabout and Courtfield Shopping Center on the R510. The proposed off-road cycle tracks on the R510 will be tied into the roundabout pedestrian crossings. The mainline of the R510 between Quinn's Cross and the Raheen Road Roundabout has an average carriage width of 9m, with 2x2m wide footpaths at either side. The proposal for the mainline is to reduce the carriage width to a 6.2m with 2m wide footpaths on either side and construct off-road cycle tracks on either side of a minimum of 2m wide between the footpath and the carriageway. Sections of on-road cycle tracks will be included at junctions / entrances along the route along with raised toucan crossings and raised entry treatment. There will also be pedestrian and cyclist links from adjacent residential areas such as Blackthorn Housing Estate and Church road to the proposed scheme. Some vegetation removal along the route is proposed to facilitate the proposed development, including trees at the north side of the road at Blackthorns Estate and at Oakfield Estate (new trees will be planted in these areas), and two mature trees on the south side between St. Nesson's National School and Mungret Gate Housing Development. There are existing cycle tracks on the roundabout at Quinn's Cross. The proposed cycle tracks on the R510 will tie into the existing roundabout tracks with a 2-way cyclist link to the Fr. Russell Road and it is not proposed to change the existing layout of Quinn's Cross Roundabout.



Figure 2 Location of the proposed cycle scheme at Raheen, Limerick.



4. IDENTIFICATION OF RELEVANT NATURA 2000 SITES

4.1 Rationale for Appropriate Assessment Screening

Article 6 assessments are required under the Habitats Directive (92/43/EEC), in instances where a plan or project may give rise to significant effects upon a Natura 2000 site. Natura 2000 sites are those identified as sites of European Community importance designated under the Habitats Directive (Special Areas of Conservation, here after referred to as SACs) or the Birds Directive (Special Protection Areas, here after referred to as SPAs).

Following the guidelines set out by DoEHLG (2010) Screening for Appropriate Assessment is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3); i.e. whether a plan or project can be excluded from Appropriate Assessment requirements because it is directly connected with or necessary to the management of the site; and the potential effects of a project or plan, either alone or in combination with other projects or plans, on a Natura 2000 site in view of its conservation objectives, and considering whether these effects will be significant.

According to DoEHLG (2010), screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the EU Habitats Directive:

- (1) Whether a plan or project is directly connected to or necessary for the management of the site, and;
- (2) Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

The proposed cycle scheme in Limerick does not comply with the first screening test (i.e. the proposed works are not directly connected to or necessary for the management of any Natura 2000 site). The current Screening Assessment therefore sets out to determine whether the development, alone or in combination with other plans and projects, is likely to have significant effects on the Natura 2000 sites within the study area.

4.2 Natura 2000 sites considered for the proposed works

The location of the proposed cycle scheme in the context of the Natura 2000 network is indicated in Figure 1 above. The Natura 2000 network is a network of nature protection areas across the European Union, comprising of Special Areas of Conservation (SAC's) and Special Protection Areas (SPA's). SACs are sites of international importance because of the presence of habitats or species that are of European importance, listed on the EU Habitats Directive (1992). SPAs are important for birds and these sites are designated based on the presence of internationally significant populations of bird species, listed in Annex I of the EU Birds Directive (2009). The SACs and SPAs within 15km of the proposed development are considered in the current screening and are listed in Table 1.

There are 6 designated Natura 2000 sites within a 15km radius of the proposed development; 2 of which are within 5km of the development. The Lower River Shannon SAC (002165) is the nearest designated site, situated c. 1.4km north-east of the proposed cycle scheme. The River Shannon and River Fergus SPA (004077) is c. 1.5km north of the site. Tory Hill SAC (000439) is c. 9.2km south of the proposed development. The other 3 sites are all over 10km from the proposed development: Askeaton Fen Complex SAC (002279) (c. 11.5km west), Curraghchase Woods SAC (000174) (c. 13.5km west) and Glenomra Wood SAC (001013) (14.4km north-east).



4.2.1 Lower River Shannon SAC

The Lower River Shannon SAC stretches from Killaloe, Co. Clare to Loop Head/Kerry head. It is designated for a wide range of habitats and species including Alluvial Forests, Molinia Meadows, Atlantic Salmon (*Salmo salar*) and Otter (*Lutra lutra*). The freshwater part of this SAC includes the main River Shannon channel and several tributaries. Molinia meadows dominated by rushes (*Juncus* spp.) and sedges (*Carex* spp.) with a high biodiversity of vegetation and important species like Blue-eyed Grass (*Sisyrinchium bermudiana*) and Pale Sedge (*C. pallescens*) are present. Alluvial woodlands are present around the University of Limerick. All three Irish Lamprey species occur in this SAC as do Twaite Shad (*Allosa fallax fallax*) and Salmon (*Salmo salar*). Other notable fish species include Smelt (*Osmerus eperlanus*) and Pollan (*Coregonus autumnalis pollan*). Much of the land has been improved or reclaimed and flood protection is common. Domestic and industrial waste in Limerick is an ongoing threat. In the Shannon estuary part of the SAC there are several species protected under Annex I of the E.U. Birds Directive.

4.2.2 River Shannon and River Fergus Estuaries SPA

The River Fergus is part of the Lower River Shannon SAC; the estuarine section of the River Fergus from Clarecastle to its confluence with the River Shannon is also part of this SPA. The Shannon and Fergus Estuary complex is the largest estuarine complex in the country. The estuary features vast expanses of intertidal mudflats which are often fringed with saltmarsh vegetation. The Shannon and Fergus Estuary complex is an internationally important site supporting an assemblage of over 20,000 wintering waterbirds and the largest numbers of wintering waterfowl in the country. This assemblage includes several Annex I EU Birds Directive species; such as, Great Northern Diver *Gavia immer*, Whooper Swan *Cygnus cygnus*, Light-bellied Brent Goose *Branta bernicla hrota*, Golden Plover *Pluvialis apricaria* and Bar-tailed Godwit *Limosa lapponica* (NPWS, 2013). There are four of species which occur in internationally important numbers at the site: Light-bellied Brent Goose *Branta bernicla hrota*, Dunlin *Calidris alpina*, Black-tailed Godwit *Limosa limosa* and Redshank *Tringa totanus* (NPWS, 2015).

Table 1 Designated Natura 2000 Sites and associated Qualifying Interests within 15km of the proposed cycle scheme development on the R510, Co. Limerick.

Natura 2000 Site	Qualifying Interests	Distance (km)
Lower River Shannon SAC (002165)	Sandbanks which are slightly covered by sea water all the time [1110]	c. 1.4km north-east
	Estuaries [1130]	
	Mudflats and sandflats not covered by seawater at low tide [1140]	
	Coastal lagoons [1150]	
	Large shallow inlets and bays [1160]	
	Reefs [1170]	
	Perennial vegetation of stony banks [1220]	
	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	
	Salicornia and other annuals colonising mud and sand [1310]	
	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]	
	Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]	
	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]	
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]	
	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0]	



Natura 2000 Site	Qualifying Interests	Distance (km)
	<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	
	<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	
	<i>Lampetra planeri</i> (Brook Lamprey) [1096]	
	<i>Lampetra fluviatilis</i> (River Lamprey) [1099]	
	<i>Salmo salar</i> (Salmon) [1106]	
	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]	
	<i>Lutra lutra</i> (Otter) [1355]	
River Shannon and River Fergus Estuaries SPA (004077)	Cormorant (<i>Phalacrocorax carbo</i>) [A017]	c. 1.5km north
	Whooper Swan (<i>Cygnus cygnus</i>) [A038]	
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]	
	Shelduck (<i>Tadorna tadorna</i>) [A048]	
	Wigeon (<i>Anas penelope</i>) [A050]	
	Teal (<i>Anas crecca</i>) [A052]	
	Pintail (<i>Anas acuta</i>) [A054]	
	Shoveler (<i>Anas clypeata</i>) [A056]	
	Scaup (<i>Aythya marila</i>) [A062]	
	Ringed Plover (<i>Charadrius hiaticula</i>) [A137]	
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]	
	Grey Plover (<i>Pluvialis squatarola</i>) [A141]	
	Lapwing (<i>Vanellus vanellus</i>) [A142]	
	Knot (<i>Calidris canutus</i>) [A143]	
	Dunlin (<i>Calidris alpina</i>) [A149]	
	Black-tailed Godwit (<i>Limosa limosa</i>) [A156]	
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]	
	Curlew (<i>Numenius arquata</i>) [A160]	
	Redshank (<i>Tringa totanus</i>) [A162]	
	Greenshank (<i>Tringa nebularia</i>) [A164]	
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]	
	Wetland and Waterbirds [A999]	
Tory Hill SAC (000439)	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	9.2km south
	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davalliana [7210]	
	Alkaline fens [7230]	
Askeaton Fen Complex SAC (002279)	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davalliana [7210]	11.5km west
	Alkaline fens [7230]	
Curraghchase Woods SAC (000174)	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0]	13.5km west
	<i>Taxus baccata</i> woods of the British Isles [91J0]	
	<i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]	
	<i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	
Glenomra Wood SAC (001013)	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	14.4km north-east



5. POTENTIAL FOR EFFECTS

Table 2 below outlines the locations of the Qualifying Interests of Natura 2000 Sites within 15km of the proposed cycle scheme, as well as potential pathways for impacts.

Table 2 Designated Natura 2000 Sites within 15km of the proposed development, the potential location of Q.I.s in relation to the proposed works, potential pathways for impacts and potential impacts arising from the proposed works.

Natura 2000 Site	Qualifying Interests	Location in relation to proposed development	Potential Pathway for Impacts	Potential for Significant Impacts
Lower River Shannon SAC (002165)	Sandbanks which are slightly covered by sea water all the time [1110]	SAC located c. 1.4km north-east of proposed development site	No	None - due to the large geographical distance between the proposed development site and this habitat and no pathway for effects – habitat is significantly separated from the proposed development
	Estuaries [1130]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Mudflats and sandflats not covered by seawater at low tide [1140]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Coastal lagoons [1150]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Large shallow inlets and bays [1160]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Reefs [1170]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Perennial vegetation of stony banks [1220]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Salicornia and other annuals colonising mud and sand [1310]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
Mediterranean salt meadows (<i>Juncetalia</i>	SAC located c. 1.4km north-east of	No	None – same as above	



Natura 2000 Site	Qualifying Interests	Location in relation to proposed development	Potential Pathway for Impacts	Potential for Significant Impacts
	<i>maritimi</i>) [1410]	proposed development site		
	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	SAC located c. 1.4km north-east of proposed development site	No	None – there is no hydrological connection with the catchment where this species is found in the SAC – no potential pathway for water quality, invasive species or disturbance impacts to arise that could affect this QI
	<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	SAC located c. 1.4km north-east of proposed development site	No	None - due to the significant geographical distance between the proposed development site and this aquatic species and no hydrological pathway for effects – species is significantly separated from the proposed development
	<i>Lampetra planeri</i> (Brook Lamprey) [1096]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	<i>Lampetra fluviatilis</i> (River Lamprey) [1099]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	<i>Salmo salar</i> (Salmon) [1106]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
	<i>Lutra lutra</i> (Otter) [1355]	SAC located c. 1.4km north-east of proposed development site	No	None – same as above
River Shannon	Cormorant (<i>Phalacrocorax carbo</i>) [A017]	SPA located c. 1.5km north of proposed development site	No	None - due to the significant geographical distance between the proposed development site



Natura 2000 Site	Qualifying Interests	Location in relation to proposed development	Potential Pathway for Impacts	Potential for Significant Impacts
and River Fergus Estuaries SPA (004077)				and this SPA – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat used by this species is significantly separated from the proposed development
	Whooper Swan (<i>Cygnus cygnus</i>) [A038]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Shelduck (<i>Tadorna tadorna</i>) [A048]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Wigeon (<i>Anas penelope</i>) [A050]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Teal (<i>Anas crecca</i>) [A052]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Pintail (<i>Anas acuta</i>) [A054]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Shoveler (<i>Anas clypeata</i>) [A056]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Scaup (<i>Aythya marila</i>) [A062]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Ringed Plover (<i>Charadrius hiaticula</i>) [A137]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Grey Plover (<i>Pluvialis squatarola</i>) [A141]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Lapwing (<i>Vanellus vanellus</i>) [A142]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Knot (<i>Calidris canutus</i>) [A143]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Dunlin (<i>Calidris alpina</i>) [A149]	SPA located c. 1.5km north of proposed development site	No	None – same as above



Natura 2000 Site	Qualifying Interests	Location in relation to proposed development	Potential Pathway for Impacts	Potential for Significant Impacts
		development site		
	Black-tailed Godwit (<i>Limosa limosa</i>) [A156]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Curlew (<i>Numenius arquata</i>) [A160]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Redshank (<i>Tringa totanus</i>) [A162]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Greenshank (<i>Tringa nebularia</i>) [A164]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]	SPA located c. 1.5km north of proposed development site	No	None – same as above
	Wetland and Waterbirds [A999]	SPA located c. 1.5km north of proposed development site	No	None – there is sufficient distance between the proposed development site and this habitat – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – habitat is significantly separated from the proposed development
Tory Hill SAC (000439)	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	SAC located c. 9.2km south of proposed development site	No	None - due to the large geographical distance between the proposed development site and this habitat and no pathway for effects – habitat is significantly separated from the proposed development
	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210]	SAC located c. 9.2km south of proposed development site	No	None – same as above
	Alkaline fens [7230]	SAC located c. 9.2km south of proposed development site	No	None – same as above
Askeaton Fen Complex SAC	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210]	SAC located c. 11.5km west of proposed development site	No	None - due to the large geographical distance between the proposed development site and this habitat and no pathway for effects – habitat is significantly separated from the proposed



Natura 2000 Site	Qualifying Interests	Location in relation to proposed development	Potential Pathway for Impacts	Potential for Significant Impacts
(002279)				development
	Alkaline fens [7230]	SAC located c. 11.5km west of proposed development site	No	None – same as above
Curraghchase Woods SAC (000174)	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0]	SAC located c. 13.5km west of proposed development site	No	None - due to the large geographical distance between the proposed development site and this habitat and no pathway for effects – habitat is significantly separated from the proposed development
	Taxus baccata woods of the British Isles [91J0]	SAC located c. 13.5km west of proposed development site	No	None – same as above
	<i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]	SAC located c. 13.5km west of proposed development site	No	None - due to the large geographical distance between the proposed development site and this SAC – there is no potential for disturbance, dust, or invasive species impacts to travel this distance – species is significantly separated from the proposed development
	<i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]	SAC located c. 13.5km west of proposed development site	No	None – same as above
Glenmra Wood SAC (001013)	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	SAC located c. 13.5km north-east of proposed development site	No	None - due to the large geographical distance between the proposed development site and this habitat and no pathway for effects – habitat is significantly separated from the proposed development

The potential direct, indirect and cumulative impacts on Natura 2000 sites identified in Section 4 resulting from the proposed cycle scheme on the R510 from Quinn's Cross to Raheen Roundabout are discussed below.



5.1 Potential direct impacts affecting Natura 2000 sites

5.1.1 Construction Phase

There would be no direct construction phase impacts arising from the proposed project as the proposed development site is not located within any Natura 2000 site and is located at a distance from the Natura 2000 network.

5.1.2 Operational Phase

There would be no direct operational phase impacts arising from the proposed project as the proposed development site is not located within any Natura 2000 site and is located at a distance from the Natura 2000 network.

5.2 Potential indirect impacts affecting Natura 2000 sites

Indirect (or secondary) impacts are defined as effects that are “caused by and result from the activity although they are later in time or further removed in distance, but still reasonably foreseeable” (Bowers-Marriott, 1997).

5.2.1 Construction Phase

The proposed development is relatively small in scale. Any potential adverse impacts arising from construction are expected to be minor and will be localised. There is a significant separation distance between the development site and any Natura 2000 sites. There is also no watercourse at the proposed development site which could convey impacts to Natura 2000 sites designated for aquatic interests. Even in the absence of any mitigation significant impacts on the Natura 2000 network is not anticipated to arise from the proposed cycle facility construction between Quinn's Cross and the Raheen Roundabout.

There is considered to be no potential for the proposed development to have a significant adverse impact on any Natura 2000 site during the construction phase.

5.2.2 Operational Phase

The proposed cycle scheme development will not result in any adverse impacts on the Natura 2000 network. The proposed cycle tracks will be constructed along an existing road corridor. The site already serves a high volume of traffic. The proposed cycle facilities alongside the existing road will be a positive addition in terms of promoting cycling as a mode of transport and potentially reduce collision risks on the road with improved road safety. There is no negative impact associated with the operation of the proposed development and certainly none that would affect any Natura 2000 sites due to separation distance from these sites and no pathway for impacts.

There is considered to be no potential for the proposed development to have a significant adverse impact on any Natura 2000 site during the operational phase.



5.3 Potential cumulative impacts affecting the Natura 2000 site

Cumulative impacts or effects are changes in the environment that result from numerous human-induced, small-scale alterations. Cumulative impacts can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects (Bowers-Marriott, 1997).

Due to the geographic distance to any Natura 2000 site and the absence of potential pathways to transfer impacts to any such sites, the proposed development does not have a pathway for cumulative impacts on the Natura 2000 network. There is no potential for impacts to arise from the proposed development that would affect any Natura 2000 site, directly or indirectly. There is therefore no potential for the proposed development to contribute to and act in combination with other impacts affecting any Natura 2000 site. It is considered that no cumulative impacts will result from the proposed development due to the absence of pathways for impacts on the Natura 2000 network.

6. SCREENING STATEMENT WITH CONCLUSIONS

According to the guidance published by the DoEHLG (2010), Screening for Appropriate Assessment can either identify that an Appropriate Assessment is not required, where a project / proposal is directly related to the management of the site; or that there is no potential for significant effects affecting the Natura 2000 network; or that significant effects are certain, likely or uncertain (i.e., the project must either proceed to Stage 2 (AA) or be rejected).

From examination of the information available, it is concluded that there is no potential for direct, indirect and cumulative impacts on the Natura 2000 network arising from the proposed Quinn's Cross to Raheen Roundabout Cycle Scheme on the R510 in Limerick. It has been concluded that no mitigation measures are required to prevent the proposed development from adversely affecting any Natura 2000 sites. Therefore, a Natura Impact Statement is not required for the proposed development.



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APPENDIX 1 NPWS SITE SYNOPSES

SITE NAME: LOWER RIVER SHANNON SAC

SITE CODE: 002165

This very large site stretches along the Shannon valley from Killaloe to Loop Head/ Kerry Head, a distance of some 120km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus Estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. The Shannon and Fergus flow through Carboniferous limestone as far as Foynes, but west of Foynes Namurian shales and flagstones redominate (except at Kerry Head, which is formed from Old Red Sandstone). The eastern sections of the Feale catchment flow through Namurian Rocks and the western stretches through Carboniferous Limestone. The Mulkear flows through Lower Palaeozoic Rocks in the upper reaches before passing through Namurian Rocks, followed by Lower Carboniferous Shales and Carboniferous Limestone. The Mulkear River itself, immediately north of Pallasgreen, passes through an area of Rhyolites, Tufts and Agglomerates. Rivers within the subcatchment of the Feale include the Galey, Smearlagh, Oolagh, Allaughaun, Owveg, Clydagh, Caher, Breanagh and Glenacarney. Rivers within the sub-catchment of the Mulkear include the Killeenagarraff, Annagh, Newport, the Dead River, the Bilboa, Glashacloonaraveela, Gortnageragh and Cahernahallia.

The site is a candidate SAC selected for lagoons and alluvial wet woodlands, both habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for floating river vegetation, *Molinia* meadows, estuaries, tidal mudflats, Atlantic salt meadows, Mediterranean salt meadows, *Salicornia* mudflats, sand banks, perennial vegetation of stony banks, sea cliffs, reefs and large shallow inlets and bays all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Bottle-nosed Dolphin, Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Atlantic salmon and Otter.

The Shannon and Fergus Estuaries form the largest estuarine complex in Ireland. They form a unit stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon estuary (considered to be a line across the narrow strait between Kilcredaun Point and Kilconly Point). Within this main unit there are several tributaries with their own 'sub-estuaries' e.g. the Deel River, Mulkear River, and Mague River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulmasherry Bay, Ballylongford Bay, Clonderalaw Bay and the Feale or Cashen River Estuary.

Both the Fergus and inner Shannon estuaries feature vast expanses of intertidal mudflats, often fringed with saltmarsh vegetation. The smaller estuaries also feature mudflats, but have their own unique characteristics, e.g. Poulmasherry Bay is stony and unusually rich in species and biotopes. Plant species are typically scarce on the mudflats, although there are some Eel-grass beds (*Zostera* spp.) and patches of green algae (e.g. *Ulva* sp. and *Enteromorpha* sp.). The main macro-invertebrate community, which has been noted from the inner Shannon and Fergus estuaries, is a *Macoma-Scrobicularia-Nereis* community.

In the transition zone between mudflats and saltmarsh, specialised colonisers of mud predominate: swards of Common Cord-grass (*Spartina anglica*) frequently occur in the upper parts of the estuaries. Less common are swards of Glasswort (*Salicornia europaea* agg.). In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as Common Reed (*Phragmites australis*) and Club-rushes (*Scirpus maritimus*, *S. tabernaemontani* and *S. triquetrus*). In addition to



the nationally rare Triangular Club-rush (*Scirpus triquetrus*), two scarce species are found in some of these creeks (e.g. Ballinacurra Creek): Lesser Bulrush (*Typha angustifolia*) and Summer Snowflake (*Leucojum aestivum*).

Saltmarsh vegetation frequently fringes the mudflats. Over twenty areas of estuarine saltmarsh have been identified within the site, the most important of which are around the Fergus Estuary and at Ringmoylan Quay. The dominant type of saltmarsh present is Atlantic salt meadow occurring over mud. Characteristic species occurring include Common Saltmarsh Grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea-milkwort (*Glaux maritima*), Sea Plantain (*Plantago maritima*), Red Fescue (*Festuca rubra*), Creeping Bent (*Agrostis stolonifera*), Saltmarsh Rush (*Juncus gerardi*), Long-bracted Sedge (*Carex extensa*), Lesser Seaspurrey (*Spergularia marina*) and Sea Arrowgrass (*Triglochin maritima*). Areas of Mediterranean salt meadows, characterised by clumps of Sea Rush (*Juncus maritimus*) occur occasionally. Two scarce species are found on saltmarshes in the vicinity of the Fergus Estuary: a type of robust Saltmarsh-grass (*Puccinellia foucaudii*), sometimes placed within the compass of Common Saltmarsh-grass (*Puccinellia maritima*) and Hard-grass (*Parapholis strigosa*).

Saltmarsh vegetation also occurs around a number of lagoons within the site. The two which have been surveyed as part of a National Inventory of Lagoons are Shannon Airport Lagoon and Cloonconeen Pool. Cloonconeen Pool (4-5 ha) is a natural sedimentary lagoon impounded by a low cobble barrier. Seawater enters by percolation through the barrier and by overwash. This lagoon represents a type which may be unique to Ireland since the substrate is composed almost entirely of peat. The adjacent shore features one of the best examples of a drowned forest in Ireland. Aquatic vegetation in the lagoon includes typical species such as Beaked Tasselweed (*Ruppia maritima*) and green algae (*Cladophora* sp.). The fauna is not diverse, but is typical of a high salinity lagoon and includes six lagoon specialists (*Hydrobia ventrosa*, *Cerastoderma glaucum*, *Lekanesphaera hookeri*, *Palaemonetes varians*, *Sigara stagnalis* and *Enochrus bicolor*). In contrast, Shannon Airport Lagoon (2 ha) is an artificial saline lake with an artificial barrier and sluiced outlet. However, it supports two Red Data Book species of Stonewort (*Chara canescens* and *Chara cf. connivens*).

Most of the site west of Kilcredaun Point/Kilconly Point is bounded by high rocky sea cliffs. The cliffs in the outer part of the site are sparsely vegetated with lichens, Red Fescue, Sea Beet (*Beta vulgaris*), Sea Campion (*Silene maritima*), Thrift and Plantains (*Plantago* spp.). A rare endemic Sea Lavender (*Limonium recurvum* subsp. *pseudotranswallinum*) occurs on cliffs near Loop Head. Cliff-top vegetation usually consists of either grassland or maritime heath. The boulder clay cliffs further up the estuary tend to be more densely vegetated, with swards of Red Fescue and species such as Kidney Vetch (*Anthyllis vulneraria*) and Bird's-foot Trefoil (*Lotus corniculatus*).

The site supports an excellent example of a large shallow inlet and bay. Littoral sediment communities in the mouth of the Shannon Estuary occur in areas that are exposed to wave action and also in areas extremely sheltered from wave action. Characteristically, exposed sediment communities are composed of coarse sand and have a sparse fauna. Species richness increases as conditions become more sheltered. All shores in the site have a zone of sand hoppers at the top and below this each of the shores has different characteristic species giving a range of different shore types in the cSAC.

The intertidal reefs in the Shannon Estuary are exposed or moderately exposed to wave action and subject to moderate tidal streams. Known sites are steeply sloping and show a good zonation down the shore. Well developed lichen zones and littoral reef communities offering a high species richness in the sub-littoral fringe and strong populations of *Paracentrotus lividus* are found. The communities



found are tolerant to sand scour and tidal streams. The infra-littoral reefs range from sloping platforms with some vertical steps to ridged bedrock with gullies of sand between the ridges to ridged bedrock with boulders or a mixture of cobbles, gravel and sand. Kelp is very common to about 18m. Below this it becomes rare and the community is characterised by coralline crusts and red foliose algae. Flowing into the estuaries are a number of tidal rivers.

Other coastal habitats that occur within the site include the following:

- Stony beaches and bedrock shores - these shores support a typical zonation of seaweeds (*Fucus* spp., *Ascophyllum nodosum* and kelps).
- Shingle beaches - the more stable areas of shingle support characteristic species such as Sea Beet, Sea Mayweed (*Matricaria maritima*), Sea Campion and Curled Dock (*Rumex crispus*).
- Sandbanks which are slightly covered by sea water at all times – there is a known occurrence of sand/gravel beds in the area from Kerry Head to Beal Head.
- Sand dunes - a small area of sand dunes occurs at Beal Point. The dominant species is Marram Grass (*Ammophila arenaria*).

Freshwater rivers have been included in the site, most notably the Feale and Mulkear catchments, the Shannon from Killaloe to Limerick (along with some of its tributaries, including a short stretch of the Kilmastulla River), the Fergus up as far as Ennis, and the Cloon River. These systems are very different in character: the Shannon being broad, generally slow-flowing and naturally eutrophic; the Fergus being smaller and alkaline; while the narrow, fast-flowing Cloon is acid in nature. The Feale and Mulkear catchments exhibit all the aspects of a river from source to mouth. SeminatURAL habitats, such as wet grassland, wet woodland and marsh occur by the rivers, however, improved grassland is most common. One grassland type of particular conservation significance, *Molinia* meadows, occurs in several parts of the site and the examples at Worldsend on the River Shannon are especially noteworthy. Here are found areas of wet meadow dominated by rushes and sedges and supporting diverse and species-rich vegetation, including such uncommon species as Blue-eyed Grass (*Sisyrinchium bermudiana*) and Pale Sedge (*Carex pallescens*).

Floating river vegetation characterised by species of Water-crowfoot (*Ranunculus* spp.), Pondweeds (*Potamogeton* spp.) and the moss *Fontinalis antipyretica* are present throughout the major river systems within the site. The rivers contain an interesting bryoflora with *Schistidium alpicola* var. *alpicola* recorded from in-stream boulders on the Bilboa, new to county Limerick.

Alluvial woodland occurs on the banks of the Shannon and on islands in the vicinity of the University of Limerick. The woodland is up to 25m wide on the banks and somewhat wider on the largest island. The most prominent woodland type is gallery woodland where White Willow (*Salix alba*) dominates the tree layer with occasional Alder (*Alnus glutinosa*). The shrub layer consists of various willow species with sally (*Salix cinerea* ssp. *oleifolia*) and what appear to be hybrids of *S. alba* x *S. viminalis*. The herbaceous layer consists of tall perennial herbs. A fringe of Bulrush (*Typha* sp.) occurs on the riverside of the woodland. On slightly higher ground above the wet woodland and on the raised embankment remnants of mixed oak-ash-alder woodland occur. These are poorly developed and contain numerous exotic species but locally there are signs that it is invading open grassland. Alder is the principal tree species with occasional Oak (*Quercus robur*), Elm (*Ulmus glabra*, *U. procera*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and the shrubs Guelder-rose (*Viburnum opulus*) and willows. The ground flora is species-rich.

Woodland is infrequent within the site; however Cahiracon Wood contains a strip of old Oak woodland. Sessile Oak (*Quercus petraea*) forms the canopy, with an understorey of Hazel and Holly



(*Ilex aquifolium*). Great Wood-rush (*Luzula sylvatica*) dominates the ground flora. Less common species present include Great Horsetail (*Equisetum telmateia*) and Pendulous Sedge (*Carex pendula*).

In the low hills to the south of the Slievefelim Mountains, the Cahernahallia River cuts a valley through the Upper Silurian rocks. For approximately 2km south of Cappagh Bridge at Knockanavar, the valley sides are wooded. The woodland consists of Birch (*Betula* spp.), Hazel, Oak, Rowan (*Sorbus aucuparia*), some Ash (*Fraxinus excelsior*) and Willow (*Salix* spp.). Most of the valley is not grazed by stock, and as a result the trees are regenerating well. The ground flora feature prominent Greater wood-rush and Bilberry (*Vaccinium myrtillus*) with a typical range of woodland herbs. Where there is more light available, Bracken (*Pteridium aquilinum*) features.

The valley sides of the Bilboa and Gortnageragh Rivers, on higher ground north east of Cappamore, support patches of semi-natural broadleaf woodland dominated by Ash, Hazel, Oak and Birch. There is a good scrub layer with Hawthorn, Willow, Holly and Blackthorn (*Prunus spinosa*) common. The herb layer in these woodlands is often open with a typically rich mixture of woodland herbs and ferns. Moss species diversity is high. The woodlands are ungrazed. The hazel is actively coppiced in places. There is a small area of actively regenerating cut away raised bog at Ballyrorheen. It is situated approx. 5km north west of Cappamore Co. Limerick. The bog contains some wet areas with good moss (*Sphagnum*) cover. Species of particular interest include the Cranberry (*Vaccinium oxycoccos*) and the White Sedge (*Carex curta*) along with two other regionally rare mosses including *S. fimbriatum*. The site is being invaded by Birch (*Betula pubescens*) scrub woodland. Both commercial forestry and the spread of rhododendron has greatly reduced the overall value of the site.

A number of plant species that are Irish Red Data Book species occur within the site; several are protected under the Flora (Protection) Order, 1999:

- Triangular Club-rush (*Scirpus triquetrus*) - in Ireland this protected species is only found in the Shannon Estuary, where it borders creeks in the inner estuary.
- Opposite-leaved Pondweed (*Groenlandia densa*) - this protected pondweed is found in the Shannon where it passes through Limerick City.
- Meadow Barley (*Hordeum secalinum*) - this protected species is abundant in saltmarshes at Ringmoylan and Mantlehill.
- Hairy Violet (*Viola hirta*) - this protected violet occurs in the Askeaton/Foynes area.
- Golden Dock (*Rumex maritimus*) - noted as occurring in the River Fergus Estuary.
- Bearded Stonewort (*Chara canescens*) - a brackish water specialist found in Shannon Airport lagoon.
- Convergent Stonewort (*Chara connivens*) - presence in Shannon Airport Lagoon to be confirmed.

Overall, the Shannon and Fergus Estuaries support the largest numbers of wintering waterfowl in Ireland. The highest count in 1995-96 was 51,423 while in 1994-95 it was 62,701. Species listed on Annex I of the E.U. Birds Directive which contributed to these totals include: Great Northern Diver (3; 1994/95), Whooper Swan (201; 1995/96), Pale-bellied Brent Goose (246; 1995/96), Golden Plover (11,067; 1994/95) and Bar-tailed Godwit (476; 1995/96). In the past, three separate flocks of Greenland White-fronted Goose were regularly found but none were seen in 1993/94. Other wintering waders and wildfowl present include Greylag Goose (216; 1995/96), Shelduck (1,060; 1995/96), Wigeon (5,976; 1995/96); Teal (2,319; 1995-96); Mallard (528; 1995/96), Pintail (45; 1995/96), Shoveler (84; 1995/96), Tufted Duck (272; 1995/96), Scaup (121; 1995/96), Ringed Plover (240; 1995/96), Grey Plover (750; 1995/96), Lapwing (24,581; 1995/96), Knot (800; 1995/96), Dunlin



(20,100; 1995/96), Snipe (719, 1995/96), Black-tailed Godwit (1062; 1995/96), Curlew (1504; 1995/96), Redshank (3228; 1995/96), Greenshank (36; 1995/96) and Turnstone (107; 1995/96). A number of wintering gulls are also present, including Black-headed Gull (2,216; 1995/96), Common Gull (366; 1995/96) and Lesser Black-backed Gull (100; 1994/95).

This is the most important coastal site in Ireland for a number of the waders including Lapwing, Dunlin, Snipe and Redshank. It also provides an important staging ground for species such as Black-tailed Godwit and Greenshank.

A number of species listed on Annex I of the E.U. Birds Directive breed within the site. These include Peregrine Falcon (2-3 pairs), Sandwich Tern (34 pairs on Rat Island, 1995), Common Tern (15 pairs: 2 on Sturamus Island and 13 on Rat Island, 1995), Chough (14-41 pairs, 1992) and Kingfisher. Other breeding birds of note include Kittiwake (690 pairs at Loop Head, 1987) and Guillemot (4010 individuals at Loop Head, 1987)

There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary consisting of at least 56-68 animals (1996). This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. Otter, a species also listed on Annex II of this directive, is commonly found on the site.

Five species of fish listed on Annex II of the E.U. Habitats Directive are found within the site. These are Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Twaite Shad (*Allosa fallax fallax*) and Salmon (*Salmo salar*). The three lampreys and Salmon have all been observed spawning in the lower Shannon or its tributaries. The Fergus is important in its lower reaches for spring salmon while the Mulkear catchment excels as a grilse fishery though spring fish are caught on the actual Mulkear River. The Feale is important for both types. Twaite Shad is not thought to spawn within the site. There are few other river systems in Ireland which contain all three species of Lamprey.

Two additional fish of note, listed in the Irish Red Data Book also occur, namely Smelt (*Osmerus eperlanus*) and Pollan (*Coregonus autumnalis pollan*). Only the former has been observed spawning in the Shannon.

Freshwater Pearl-mussel (*Margaritifera margaritifera*), a species listed on Annex II of the E.U. Habitats Directive, occurs abundantly in parts of the Cloon River.

There is a wide range of land uses within the site. The most common use of the terrestrial parts is grazing by cattle and some areas have been damaged through overgrazing and poaching. Much of the land adjacent to the rivers and estuaries has been improved or reclaimed and is protected by embankments (especially along the Fergus Estuary). Further, reclamation continues to pose a threat as do flood relief works (e.g. dredging of rivers). Gravel extraction poses a major threat on the Feale.

In the past, Cord-grass (*Spartina* sp.) was planted to assist in land reclamation. This has spread widely, and may oust less vigorous colonisers of mud and may also reduce the area of mudflat available to feeding birds.

Domestic and industrial wastes are discharged into the Shannon, but water quality is generally satisfactory - except in the upper estuary, reflecting the sewage load from Limerick City. Analyses for trace metals suggest a relatively clean estuary with no influences by industrial discharges apparent.



Further industrial development along the Shannon and water polluting operations are potential threats.

Fishing is a main tourist attraction on the Shannon and there are a large number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. The River Feale is a designated Salmonid Water under the E.U. Freshwater Fish Directive. Other uses of the site include commercial angling, oyster farming, boating (including dolphin-watching trips) and shooting. Some of these may pose threats to the birds and dolphins through disturbance. Specific threats to the dolphins include underwater acoustic disturbance, entanglement in fishing gear and collisions with fast moving craft.

This site is of great ecological interest as it contains a high number of habitats and species listed on Annexes I and II of the E.U. Habitats Directive, including the priority habitat lagoon, the only known resident population of Bottle-nosed Dolphin in Ireland and all three Irish lamprey species. A good number of Red Data Book species are also present, perhaps most notably the thriving populations of Triangular Club-rush. A number of species listed on Annex I of the E.U. Birds Directive are also present, either wintering or breeding. Indeed, the Shannon and Fergus Estuaries form the largest estuarine complex in Ireland and support more wintering wildfowl and waders than any other site in the country. Most of the estuarine part of the site has been designated a Special Protection Area (SPA), under the E.U. Birds Directive, primarily to protect the large numbers of migratory birds present in winter.

SITE NAME: RIVER SHANNON AND RIVER FERGUS ESTUARIES SPA
SITE CODE: 004077

The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat west from Limerick City and south from Ennis, extending west as far as Killadysert and Foynes on the north and south shores respectively of the River Shannon (a distance of some 25 km from east to west). Also included are several areas in the outer Shannon estuary, notably Clonderalaw Bay and Poulnasherry Bay, as well as the intertidal areas on the south shore of the Shannon between Tarbert and Beal Point.

The site has vast expanses of intertidal flats. The main macro-invertebrate community present is a *Macoma-Scrobicularia-Nereis* community which provides a rich food resource for the wintering birds. Other species occurring include Common Cockle (*Cerastoderma edule*), Lugworm (*Arenicola marina*), the polychaete *Nephtys hombergii*, the gastropod *Hydrobia ulvae* and the crustacean *Corophium volutator*. Eelgrass (*Zostera* spp.) is present in places, along with green algae (e.g. *Ulva* spp. and *Enteromorpha* spp.).

Salt marsh vegetation frequently fringes the mudflats and this provides important high tide roost areas for the wintering birds. Characteristic species occurring include Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea-milkwort (*Glaux maritima*), Sea Plantain (*Plantago maritima*), Red Fescue (*Festuca rubra*) and Saltmarsh Rush (*Juncus gerardi*). In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as Common Reed (*Phragmites australis*) and club-rushes (*Scirpus maritimus*, *S. lacustris* subsp. *tabernaemontani*). Also found is the nationally rare Triangular Club-rush (*Scirpus triqueteter*).

Elsewhere in the site the shoreline comprises stony or shingle beaches. The site is the most important coastal wetland site in the country and regularly supports in excess of 50,000 wintering waterfowl (mean of 59,183 for the 4 seasons 1996-97 to 1999/00), a concentration easily of international



importance. The site has internationally important populations of Dunlin (14,987), Black-tailed Godwit (706) and Redshank (1,983) - all figures are average peaks for 3 of the 5 seasons in the 1995/96-1999/00 period. A further 16 species have populations of national importance, i.e. Cormorant (148), Whooper Swan (141), Greylag Goose (88), Shelduck (895), Wigeon (3,025), Teal (1,558), Pintail (40), Shoveler (56), Scaup (76), Golden Plover (4,073), Grey Plover (564), Lapwing (13,007), Knot (686), Bar-tailed Godwit (481), Curlew (1,231) and Greenshank (33). The site is among the most important in the country for several of these species, notably Dunlin (11% of national total), Grey Plover (7.5% of total), Lapwing (6.5% of total), Redshank (6% of total) and Shelduck (6.0% of total). The site is also used by Oystercatcher (363), Ringed Plover (70), Brent Goose (135), Great Crested Grebe (47), Red-breasted Merganser (14), Mallard (247), Turnstone (71), Mute Swan (54), Grey Heron (25), Black-headed Gull (1,233) and Common Gull (194). The Shannon / Fergus system was formerly frequented by a Greenland Whitefronted Goose population but this declined during the 1980s and 1990s and the birds now appear to have abandoned the area. The site provides both feeding and roosting areas for the wintering birds. Habitat quality for most of the estuarine habitats is good. Some species, particularly Whooper Swan and Greylag Goose, utilise areas outside of the site for feeding. Apart from the wintering birds, large numbers of some species also pass through the site whilst on migration in spring and/or autumn. Regular species include Blacktailed Godwit, Whimbrel and Greenshank. Much of the land adjacent to the rivers and estuaries has been reclaimed and improved for agriculture and is protected by embankments (especially along the River Fergus estuary). Further reclamation, especially near to the urbanised and industrial areas continues to pose a threat. The site receives pollution from several sources, including industry and agriculture, but it is not known if this has any significant impacts on the wintering birds.

Aquaculture occurs in some areas of the site – future increases in this activity could cause disturbance to the habitats and the associated birds. Common Cord-grass (*Spartina anglica*) is well-established and may threaten some of the estuarine habitats. Some disturbance occurs from boating activities. This site is of great ornithological interest, being of international importance on account of the numbers of wintering birds it supports. It also supports internationally important numbers of three species, i.e. Dunlin, Black-tailed Godwit and Redshank. In addition, there are 16 species that have populations of national importance. For several of the bird species, it is the top site in the country. Also of note is that three of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Golden Plover and Bar-tailed Godwit. The site is most effectively censused from the air and this is carried out in most winters.