Stage I Appropriate Assessment Screening Report



Cappamore Fire Station Gortnascarry, Cappamore, Co. Limerick



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Contents

1.0	Introduction4
	1.1 Purpose of the Report
	1.2 Competency of Assessor
	1.3 Project Description
2.0	Methodology5
	2.1 Desk Based Studies
	2.2 Field-based Studies
	2.3 Appropriate Assessment Methodology7
3.0	Stage I Appropriate Assessment 11
	3.1 Source-Pathway-Receptor Approach and Identification of Zone of
	Influence
	3.2 Description of Relevant Receptor-Source-Pathway Connections
	between the proposed development site and European sites
	Identified11
	3.3 Lower River Shannon SAC14
	3.3.1 Ecological Baseline Description for Lower River Shannon SAC 14
	3.3.2 Qualifying Interests & Conservation Objectives of Lower River Shannon
	SAC 14
4.0	Screening Assessment of Likely Effects
	4.1 Habitat Loss/Alteration16
	4.2 Disturbance and/or Displacement of Species
	4.3 Habitat /Species Fragmentation17
	4.4 Changes in Population Density17
	4.5 Impacts to Water Quality17
5.0	In Combination Effects of Plans & Projects
6.0	Screening Statement Conclusions19



<u>Tables</u>

Table 1

Natura 2000 Sites within 15km of Site

<u>Figures</u>

- Figure 1 Site location map
- Figure 2 Site Location Map (Aerial View) with Site Drainage Information
- Figure 3 Proposed SW Drainage Layout
- Figure 4 Proposed Foul Drainage Layout
- Figure 5 Habitat Map (Aerial Photo)
- Figure 6 Special Areas of Conservation (SACs) within 15km of Site
- Figure 7 Special Protection Areas (SPAs) within 15km of Site
- Figure 8 Floating River Vegetation Distribution Lower River Shannon SAC
- Figure 9 Freshwater Pearl Mussel Distribution Lower River Shannon SAC
- Figure 10 Catchment Drainage Information

Appendices

- Appendix A Registered Practice of CIEEM
- Appendix B Plates
- Appendix C Protected Spp recorded in 10km² R75
- Appendix D Site Synopsis Lower River Shannon SAC



1.0 Introduction

1.1 Purpose of the Report

An Appropriate Assessment (AA) Screening Assessment were undertaken by Ash Ecology & Environmental Ltd (AEE) on behalf of Limerick City & County Council (LCCC) for the Proposed Refurbishment Works of Cappamore Fire Station, Cappamore, Co. Limerick

The site of the existing Fire Station at Gortnascarry, Cappamore, Co. Limerick is at the junction of Kyle Road and Doon Road, See Figures 1 and 2. The proposed works are for a proposed refurbishment of the existing and an extension of similar width and length to the existing, and all ancillary works.

The purpose of the assessment was to determine the potential impacts, if any, of the proposed works on nearby sites with European conservation designations (i.e. Natura 2000 sites).

1.2 Competency of Assessor

This report has been prepared by Aisling Walsh whose qualifications include MSc in Biodiversity and Conservation (TCD), B.Sc. (Hons) Zoology (NUIG) and B.Sc in Applied Aquatic Science (GMIT) with relevant modules in Hydrology. Aisling is the Managing Director of Ash Ecology & Environmental Ltd and has over 15 years of experience providing environmental consultancy and environmental assessment services. She is a full member of the Chartered Institute of Ecological and Environmental Management (CIEEM) and also a Licenced Bat Ecologist. She has also provided input and reviewed Ecological and Environmental assessments for several EIS and EIAR including the hydrology and water quality assessment chapters of same. AEE is a registered practice of the CIEEM (see Appendix A).

1.3 **Project Description**

This project is for the refurbishment of the existing and an extension of similar width and length to the existing.

There is a 450mm culvert running through the site taking a small drain, with minimal flows found in it. There is no river running through the site.

The proposed surface water drainage layout and proposed foul water drainage are shown as Figures 3 and 4. The foul and surface water disposal will be connected to the existing public mains.

Any trees onsite will be retained. No open water streams or drains will be affected by the works.



2.0 Methodology

This report has been prepared by AEE using the following guidance documents:

- European Commission (Nov 2018) Managing Natura 2000 sites, The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC
- Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. (Department of the Environment, Heritage and Local Government, 2010).
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10.
- 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 (European Commission Environment Directorate-General, 2001). The Guidance within this document provides a non-mandatory methodology for carrying out assessments required under Article 6(3) and (4) of the Habitats Directive.
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC (EC Environment Directorate-General, 2000).
- Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC. Clarification of the Concepts of Alternative Solutions, Imperative Reasons of Over-riding Public Interest, Compensatory Measures, Overall Coherence. Opinion of the European Commission (European Commission, January 2007).

2.1 Desk Based Studies

A desk-based review of information sources was completed. Information contained on the websites of the National Parks and Wildlife Service (NPWS)¹ and the National Biodiversity Data Centre (NBDC)² was reviewed. In addition, the following publications and websites were also reviewed and consulted:

- Ordnance Survey of Ireland mapping and aerial photography available from <u>www.heritagemaps.ie;</u>
- Online data available on European sites as held by the National Parks and Wildlife Service (NPWS) from <u>www.npws.ie</u>;
- Information on water quality and water body mapping in the area available from EPA ENVISION mapping;
- http://maps.epa.ie/internetmapviewer/mapviewer.aspx
- EPA <u>www.epa.ie/QValue/webusers</u>
- Information on the status of EU protected habitats and species in Ireland (National Parks & Wildlife Service, 2013a and 2013b)³

² The National Biodiversity Data Centre <u>www.NBDC.ie</u>

¹ The National Parks and Wildlife Services map viewer <u>http://webgis.npws.ie/npwsviewer/</u>

³ NPWS (2013a). The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 2, Version 1.1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2013b). The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.



- Information on Special Conservation Interests for SPAs in Ireland from Irelands Article 12 submission to the EU Commission on the Status and trends of birds species 2008- 2012⁴
- NRA (2009) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes, National Roads Authority
- Water Framework Ireland website <u>http://www.wfdireland.ie/maps.html</u>
- IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters, Inland Fisheries Ireland;
- River Basin Management District 2018-2021;
- Natura Impact Statement of the RBMP 2018-2021;
- The National Parks and Wildlife Service (NPWS) website <u>www.npws.ie</u>
- National Biodiversity Data Centre (NBDC) <u>www.NBDC.ie</u>
- Limerick County Development Plan 2010-2016 (Limerick County Council, 2010)
- Limerick City Development Plan 2010-2016 (Limerick City Council, 2010)
- Draft Limerick County Development Plan 2022-2028 (Limerick City and County Council, June 2021)
- Natura Impact Report, January 2018, As part of the preparation of the Proposed Variation No. 6, Limerick County Development Plan 2010-2016 (as extended)

⁴ NPWS (2015) The Status and trends of Ireland's bird species (2008-2012). Available at <u>http://www.npws.ie/status-and-trends-ireland%E2%80%99s-bird-species-%E2%80%93-article-12-reporting</u>



2.2 Field-based Studies

The site was assessed for the purposes of this report by Aisling Walsh during April 2022. Plates of the site are attached as Appendix B. Habitats were identified and classified according to Fossitt (2000)⁵ and Smith *et al.* (2011)⁶. During the assessment, particular attention was given to the possible presence of highly invasive plant species⁷ and habitats or species which are legally protected under Irish or European legislation (Wildlife Acts 1976 to 2018; EU Habitats Directive; EU Birds Directive), or listed on the Flora Protection Order (2015) or Red Data books.^{8, 9} Plant nomenclature follows Parnell and Curtis (2012).¹⁰ Protected Species recorded within 10km² R75 (within which the site is located) are listed as Appendix C. No species on this list were recorded on the site visit.

There were no habitats present within the applicant site boundary that would qualify as Annex I Habitats with the main habitat on site being:

- Buildings and Artificial Surfaces (BL3)
- Amenity Grassland (GA2), a habitat of low biodiversity.
- Mature treeline (WL2) at entrance, to be retained.

A habitat map is shown as Figure 5.

2.3 Appropriate Assessment Methodology

2.3.1 Regulatory Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as "*The Habitats Directive*" provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 of the Directive provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC) (better known as "The Birds Directive").

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment:

⁷Risk of High Impact Invasive Species for Ireland List

⁵ Fossitt, J. (2000). A Guide to Habitats in Ireland. The Heritage Council, Kilkenny.

⁶ Smith, G.F., O'Donoghue, P., O'Hora, K. and Delaney, E. (2011) Best practice guidance for habitat survey and mapping. The Heritage Council, Kilkenny.

http://www.biodiversityireland.ie/wordpress/wp-

content/uploads/Invasives taggedlist HighImpact 2013RA-1.pdf

⁸ Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

⁹ Colhoun, K and Cummins, S (2013) Birds of Conservation Concern in Ireland 2014–2019, Irish Birds 9: 523-544. ¹⁰ Parnell, J and Curtis, J. (2012). Webb's, An Irish Flora. Cork University Press.



"Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the component 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".

Articles 6(3) and 6(4) of the Habitats Directive require an Appropriate Assessment of plans to prevent significant adverse effects on European conservation sites, also known as Natura 2000 sites. In this particular case the purpose of Appropriate Assessment is to assess the potential impacts of the proposed activities on the conservation objectives of European sites. The assessment will determine whether the plan would have significant adverse affects upon the integrity of each site in terms of its nature conservation objectives.

The integrity of the site has been defined as "the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified" (PPG 9, UK Department of the Environment, October 1994). Where negative effects are identified other options should be thoroughly examined to avoid any potential damaging effects prior to implementing the plan.



2.3.2 AA Process

The European Commission's Methodological Guidance recommends a 4 stage approach:

Stage 1: Screening

Determining whether the plan 'either alone or in combination with other plans or projects' is likely to have a significant effect on a European site.

Stage 2: Appropriate Assessment

Determining whether, in view of the site's conservation objectives, the plan 'either alone or in combination with other plans or projects' would have an adverse effect (or risk of this) on the integrity of the site. If not, the plan can proceed.

Stage 3: Assessment of Alternative Solutions

Where it has not been proven that measures considered will not avoid or mitigate the adverse affect on the Natura 2000 site, then an assessment of the alternatives will be required; and if none are acceptable then stage 4 is required to be considered.

Stage 4: Assessment where no Alternative Solutions Exist & where Adverse Impacts Remain

This will involve assessment where the Plan is considered to result in adverse impacts on the Natura 2000 site and no alternative solutions remain – the imperative reasons of overriding public interest (IROPI) test must be met before authorisation, permission or adoption of the Plan is agreed. This includes the agreement of compensatory measures. This report covers Stage 1 of Appropriate Assessment - Screening. The outcome of each stage determines whether a further stage in the process is required.

This report comprises a Stage 1 Screening Report.





A flow diagram illustrating the various stages of AA are outlined below (EC 2018)¹¹:

Ash Ecology & Environmental Ltd – April 2022

¹¹ Figure taken from - European Commission (Nov 2018) Managing Natura 2000 sites, The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC



3.0 Stage | Appropriate Assessment

3.1 Source-Pathway-Receptor Approach and Identification of Zone of Influence

In establishing which European sites are potentially at risk (in the absence of mitigation) from the proposed development, a source-pathway-receptor approach was applied. In order for an impact to occur, there must be a risk enabled by having a source (e.g. water abstraction or construction works), a receptor (e.g. a European site or its Qualifying Interest(s) (QIs) or Special Conservation Interest(s) (SCIs) species), and a pathway between the source and the receptor (e.g. pathway by air for air borne pollution, or a pathway by a watercourse for mobilisation of pollution). For an impact to occur, all three elements must exist; the absence or removal of one of the elements means there is no possibility for the impact to occur.

The identification of source-pathway-receptor connection(s) between the proposed development and European sites essentially is the process of identifying which European sites are within the Zone of Influence (ZoI) of the proposed development, and therefore potentially at risk of significant effects. The ZoI is defined as the area within which the proposed development could affect the receiving environment such that it could potentially have significant effects on the QI habitats or QI/SCI species of a European site, or on the achievement of their conservation objectives (as defined in CIEEM, 2018).

The identification of a source-pathway-receptor risk does not automatically mean that significant effects will arise. The likelihood for significant effects will depend upon the characteristics of the source (e.g. extent and duration of construction works), the characteristics of the pathway (e.g. direction and strength of prevailing winds for air borne pollution) and the characteristics of the receptor (e.g. the sensitivities of the European site and its Qls/SCls). However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the significance of the effect depending upon the nature and exposure to the risk and the characteristics of the receptor. In this case, where uncertainty existed, the precautionary principle was applied.

3.2 Description of Relevant Receptor-Source-Pathway Connections between the proposed development site and European sites Identified

In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites that can be potentially affected by the proposed works has been compiled. Adopting the precautionary principle in identifying these sites, it has been decided to include all SACs (Special Areas of Conservation) and SPAs (Special Protection Areas) within 15km of the site in Kilbride, Arklow, Co. Wicklow.

The nearest protected areas to the site are listed below in Table 1. A map showing the 5 SAC sites and 1 SPA site located within a 15km radius of the site are shown as Figures 6 and 7. The proposed works do not occur within a European Designated site.



Table 1		Vatura 2000 Sites within	n 15km of the	e Site.
	Code	Site Name	Approx. Distance (as the crow flies)	Screening Conclusion
			SAC Sites	
1	002165	Lower River Shannon	230m NE, E, SE, S, SW, W, NW, N	Screened in for drainage and disturbance impacts resulting from proposed works.
2	001847	Philipston Marsh SAC	12.6km SE	These 4 sites Screened out as they are outside the Zone of Influence. There are
3	001432	Glenstal Wood SAC	6.3km NW	no hydrological impact to these sites
4	002137	Lower River Suir	13.9km E, SE	for there to be no disturbance impacts
5	001197	Keeper Hill SAC	14km NE	sites due to works.
			SPA Sites	
1	004165	Slievefelim to Silvermines Mountains SPA	2.9km N, NW, NE	All sites Screened out as they are outside the Zone of Influence. There are no hydrological impact to these sites and also the distance >2.9km is sufficient for there to be no disturbance impacts to Hen Harrier due to works as the habitat of the existing fire station is not suitable.

The proposed works do not occur with a Natura 2000 site however is located ~230m from the Lower River Shannon SAC (as the Bilboa River), see Figure 2. In this regard the potential impacts with regard to water quality and disturbance will be addressed in detail in Section 4.0.

The Site Synopsis for the Lower River Shannon SAC contained within Appendix D.

Table 2 overleaf lists the features of interest for the Lower River Shannon SAC and the likelihood of occurrence.



Table 2Features of Interest	st and	Likelihood of Occurrence for Potentially
Attected Natura Site	es.	
Qualifying Interest C	ode	Impacts to QI Screened In/Out
Sandbanks which are slightly covered by sea water all the time	1110	
Estuaries	11.30	
Mudflats and sandflats not covered	1140	
by segwater at low tide	1140	
Coastal lagoons	1150	
Large shallow inlets and bays	1160	
Reefs	1170	
Perennial vegetation of stony	1220	Screened out, outside area of interest. Estuarine and marine habitats.
Vegetated seg cliffs of the Atlantic	1230	
and Baltic coasts		
Salicornia and other annuals	1310	
colonising mud and sand		
Atlantic salt meadows (Glauco-	1330	
Puccinellietalia maritimae)		
Mediterranean salt meadows (Juncetalia maritimi)	1410	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	3260	The surface water drainage network on the site connects with the surface water drainage network which ultimately drains to the Bilboa River ~230m east of the of the site at the closest point via the DOOGLASHA Stream which runs through the site. Screened in for further assessment. Inside area of interest, see Figure 8.
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	6410	
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno- Padion, Alnion incanae, Salicion albae)	91E0	Habitats not recorded on the site.
Margaritifera margaritifera	1029	Screened out, outside area of interest, see
(Freshwater Pearl Mussel)		Figure 9.
Petromyzon marinus (Sea Lamprey)	1095	Screened out, outside area of interest.
Lampetra planeri (Brook Lamprey)	1096	Screened in, likely to be present in Bilboa
Lampetra fluviatilis (River Lamprey)	1099	River ~230 east of site.
Salmo salar (Salmon)	1106	
Tursiops truncatus (Common Bottlenose Dolphin)	1349	Screened out, outside area of interest (Marine Mammal).



3.3 Lower River Shannon SAC

3.3.1 Ecological Baseline Description for Lower River Shannon SAC

As described in the Natura 2000 Standard Data Form (NPWS 2017), the Lower River Shannon SAC comprises an extensive site approximately 14km wide and 120km long encompassing: the drained river valley which forms the River Shannon estuary; the broader River Fergus estuary, plus a number of smaller estuaries e.g. Poulnasherry Bay; the freshwater lower reaches of the Shannon River, between Killaloe and Limerick, plus the freshwater stretches of much of the Feale and Mulkear catchments; a marine area at the mouth of the Shannon estuary with high rocky cliffs to the north and south; ericaceous heath on Kerry Head and Loop Head; and several lagoons. The underlying geology ranges from Carboniferous limestone (east of Foynes) to Namurian shales and flagstones (west of Foynes) to Old Red Sandstone (at Kerry Head).

The site contains a wide variety of Annexed habitats, including the most extensive area of estuarine habitat in Ireland, and Annexed species including the only known resident population of common bottlenose dolphin *Tursiops truncatus* in Ireland, all three Irish species of lamprey, and Atlantic salmon *Salmo salar*. A number of birds listed on the EU Birds Directive either winter or breed in the site. The site is internationally important for waterfowl with more than 50,000 individuals occurring in winter. Several species listed in the Irish Red Data Book are present, perhaps most notably the only known Irish populations of *Scirpus triqueter*.

3.3.2 Qualifying Interests & Conservation Objectives of Lower River Shannon SAC

The qualifying interest Annex I habitats and species of the Lower River Shannon SAC, and the overall conservation objective for each, are listed below in Table 3.¹²

Table 3	Qualifying	Interests	and	Conservation	Objectives ⁵	of	Lower	River
Shannon SAC	2							

Qualifying Interests C	Conservation Objectives
Annex I Habitats	
Sandbanks which are slightly covered by sea water all the t [1110]	ime To maintain favorable conservation condition.
Estuaries [1130]	
Mudflats and sandflats not covered by seawater at low tide [1140]	>
*Coastal lagoons [1150]	
Large shallow inlets and bays [1160]	
Reefs [1170]	

¹² Conservation objectives for Lower River Shannon SAC [002165]. Version 1.0. Department of Arts, Heritage and the Gaeltacht.



ervation Objectives
To restore favorable conservation condition.
To maintain favorable conservation condition.
To restore favorable conservation
T
condition.
To restore favorable conservatio condition.
]



4.0 Screening Assessment of Likely Effects

As the proposed development does not overlap with the Lower River Shannon SAC, none of the qualifying interest habitats or species will be directly impacted. The habitat onsite would not support any of the Annex II species of the Lower River Shannon SAC. The Lower River Shannon SAC also lies beyond the ZoI of any hydrogeological, air quality or disturbance/displacement impacts.

However, there are the following indirect impacts by which the proposed development could potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of the Lower River Shannon SAC:

- An accidental pollution event during construction phase affecting water quality in the Dooglasha Stream which flows to the Bilboa River.
- An accidental pollution event during operation phase affecting water quality in the Dooglasha Stream which flows to the Bilboa River.
- Disturbance due to close proximity of the Lower River Shannon, ~230m east.

A number of factors were examined at this stage and dismissed, or carried forward for appropriate assessment as relevant.

4.1 Habitat Loss/Alteration

As there will be <u>no</u> direct habitat loss of any of the Natura 2000 SAC & SPA sites listed in Table 1 and impacts arising from habitat loss/alteration are therefore screened out.

The existing mature treeline will be retained. If any trees require removal due to unforeseen reason this can only occur outside the bird nesting season which runs from March 1st to 31st August on a given year.

4.2 Disturbance and/or Displacement of Species

Disturbance and displacement of fauna species as a result of construction related disturbance could potentially occur within the vicinity of the proposed works. For mammal species such as otter and badger, disturbance effects would not be expected to extend beyond 250m¹³. For birds, disturbance effects would not be expected to extend beyond a distance of c.300m, as noise levels associated with general construction activities would attenuate to close to background levels.

The proposed works is 230m to the Bilboa River so technically could affect otter, however this is unlikely given there is already an existing fire station onsite, together with the regular noise from the local roads, along with the other dwellings and

¹³ This is consistent with Transport Infrastructure Ireland (TII) guidance (Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.



businesses in this busy village, which all form a buffer between the site and the Bilboa River. It is expected that the proposed works are unlikely to affect otter during the operational phase. During the construction phase the proposed works will take place during normal daytime hours and as Otter is a crepuscular animal (species that are primarily active at dawn and dusk) it would be unaffected in this respect.

All other species of interest for the Lower River Shannon SAC are either plant or animal species occurring instream or not in the vicinity of the site (see Table 2). Impacts to these protected species are ruled out due to the distance and the fact the construction works will be localised and temporary.

Disturbance to features of interest of the all SAC and SPA sites within 15km are screened out.

4.3 Habitat /Species Fragmentation

Habitat fragmentation has been defined as the 'reduction and isolation of patches of natural environment'¹⁴ usually due to an external disturbance such that an alteration of the spatial composition of a habitat occurs that alters the habitat and 'create[s] isolated or tenuously connected patches of the original habitat.' This results in spatial separation of habitat units which had previously been in a state of greater continuity.

It is considered that habitat fragmentation of qualifying habitats will not arise from the proposed works and is therefore screened out.

4.4 Changes in Population Density

It is not expected that the proposed works will cause any reduction in the baseline population of any qualifying species of the SAC or SPA sites within 15km and is therefore screened out.

4.5 Impacts to Water Quality

The site resides within the Water Framework Directive (WFD) Hydrometric Area '25 -Lower Shannon (Catchment 25D) and WFD Sub-catchment 'Bilboa_SC_010'.

It is within the WFD River Sub-Basin 'BILBOA_020' and the 2013-2018 WFD River Status of BILBOA_020 is '**Good'** and WFD River Risk Status is '**Not at Risk'**.

The site is located within the 'Slieve Phelim' with a 2013-2018 WFD Groundwater Body Status of '**Good**' and '**Not at Risk**'.

The closest EPA monitoring point (1.3km downstream and southeast of site), with a recent sample result (2018) is along the Bilboa River at Station Name 'Br 1.5 km d/s Cappamore' which received a '**Q4-5 High'** Status.

¹⁴ Franklin, A. N. (2002). What is Habitat Fragmentation? Studies in Avian Biology, 20-29.



The water quality of the general catchment area is shown as Figure 9.

The potential risk to water quality during the construction phase of the proposed works e.g. silt and harmful substances becoming entrained in surface water run-off is ruled out as the Dooglasha Stream, which runs under the site, is culverted. There is therefore no direct pathway to cause water pollution. The operational phase will be ensure foul water is directed to the public mains and not to any watercourses.

Overall negative impacts to ground and surface water quality resulting from the works to Lower River Shannon SAC are screened out.

5.0 In Combination Effects of Plans & Projects

Article 6(3) of the Habitats Directive requires an assessment of a plan or project to consider other plans or programmes that might, in combination with the plan or project, have the potential to adversely impact upon European sites.

Impacts to Lower River Shannon SAC have been screened out in Section 4.0. All other European SAC and SPA sites listed in Table 1 fall beyond the ZoI of the proposed works, >2.9km away. Given the confined area of the works, and the lack of direct connections to any Natura 2000 sites, there is no potential for any other plans or projects to act in combination with the proposed works which would adversely affect the integrity of any other European sites.

In addition Limerick City and County Council assess each planning application requiring a Screening for Appropriate Assessment on an individual basis and ask for further information accordingly depending on scale and location of development.



6.0 Screening Statement Conclusions

According to NPWS (2009), the Appropriate Assessment Screening exercise can either identify that an Appropriate Assessment is not required; or that there is no potential for significant effects (i.e. Appropriate Assessment is not required); or that significant effects are certain, likely or uncertain (i.e. the project must either proceed to Stage 2 (AA) or be rejected).

The Lower River Shannon SAC, approx. 230m east of the site, were assessed for impacts from the proposed works and all impacts were screened out.

In conclusion, upon the examination, analysis and evaluation of the relevant information including, in particular, the nature of the proposed works and the likelihood of significant effects on any Natura 2000 site, in addition to considering possible in-combination effects, and applying the precautionary principles, it is concluded by the author of this report that, on the basis of objective information, the possibility may be excluded that the proposed works will have a significant effect on any of the Natura 2000 sites below:

- Lower River Shannon
- Philipston Marsh SAC
- Glenstal Wood SAC
- Lower River Suir
- Keeper Hill SAC
- Slievefelim to Silvermines Mountains SPA

These complete, precise and definitive findings, based on the best available scientific evidence, remove all reasonable scientific doubt that the proposed works will have any significant impacts on the Natura 2000 sites detailed above; and it is therefore concluded that there will be no likely significant negative impacts caused to any Natura 2000 sites as a result of the proposed works. A Natura Impact Statement (NIS) is not required.









1	Client Limerick City & County Council			Drawing Proposed SW Drainage Layout				
	dol Sc	creening Report		Tope	364 577	Dramage	Layout	
		Drawing Number Figure 3	Status Final	Sht. Size A4	Scale As Shown	Date Apr 22	Drawn AW	J



Client Limerick City & County Council			Drawing Proposed Foul Drainage Layout				
Job Screening Report							
\Box		Drawing Number Figure 4	Status Final	Sht. Size A4	Scale As Shown	Apr 22	Drawn AW



Approx. area of works Treeline (WL2) Amenity Grassland (GA2) Buildings and Artificial Surfaces (BL3)

Client Limerick City & County Council				Drawing Habitat Map				
Job Screening Report								
		Drawing Number Figure 5	Status Final	Sht. Size A4	Scale As Shown	Date Aug 20	Drawn AW	



No.	Site Code	Name	Distance (km)
1	002165	Lower River Shannon	230m NE, E, SE, S, SW, W, NW, N
2	001847	Philipston Marsh SAC	12.6km SE
3	001432	Glenstal Wood SAC	6.3km NW
4	002137	Lower River Suir	13.9km E, SE
5	001197	Keeper Hill SAC	14km NE

Client Limerick City & County Council			Drawin	ng		
Job Scree	Job Screening Report			l Areas o 15km o	of Conser f Site	vation (SACs)
\Box	Drawing Number Figure 6	Status Final	Sht. Size A4	Scale As Shown	Apr 22	Drawn AW







	Drawing Number	Status	Sht. Size	Scale		i
Scree	ning Report	Distr	ibutior er Rive	י – r S	ł	

Final

Figure 9

A4

er River Shannon SAC Scale Date Drawn As Shown Apr 22 AW



APPENDICES

APPENDIX A



Registered Practices Certificate

April 2022 – March 2023

Pioneer Environment Group Ltd

has been admitted as a Registered Practice

of the

Chartered Institute of Ecology

and Environmental Management

on the 17th day of March 2022

Richard Handley CEcol MCIEEM President

17th March 2022

This certificate remains the property of CIEEM. Membership is subject to annual renewal and may be authenticated by contacting CIEEM at the registered address. Company no. RC000861. Registered Charity Number (England and Wales): 1189915. Registered address: Grosvenor Court, Ampfield Hill, Ampfield, Romsey, SO51 9BD United Kingdom.

APPENDIX B



Plate 1 Existing habitat that will be affected for extension is Buildings and Artificial Surfaces –BL3. Treeline (WL2) and Amenity Grassland (GA2) unaffected.



Plate 2 Existing habitat that will be affected for extension is Buildings and Artificial Surfaces –BL3. Treeline (WL2) and Amenity Grassland (GA2) unaffected.



Plate 3 Existing habitat that will be affected for extension is Buildings and Artificial Surfaces –BL3. Treeline (WL2) and Amenity Grassland (GA2) unaffected.

APPENDIX C

Species	Species name	Date of last	Designation
group		record	
amphibian	Common Frog (Rana	15/03/2003	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V
	temporaria)		Protected Species: Wildlife Acts
amphibian	Smooth Newt (Lissotriton vulgaris)	31/12/1974	Protected Species: Wildlife Acts
bird	Barn Owl (Tyto alba)	18/02/2021	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened
			Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Barn Swallow (Hirundo	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened
	rustica)		Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Black-headed Gull (Larus	29/02/1984	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened
	ridibundus)		Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Common Coot (Fulica	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds
	atra)		Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II
			Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of
			Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Grasshopper	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened
	Warbler (Locustella		Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
	naevia)		
bird	Common Kestrel (Falco	05/10/2015	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened
	tinnunculus)		Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Kingfisher	31/07/1991	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds
	(Alcedo atthis)		Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened
			Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Linnet	31/12/2011	Protected Species: Wildlite Acts Threatened Species: Birds of Conservation Concern Threatened
	(Carduelis cannabina)		Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Pheasant	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds
	(Phasianus colchicus)		Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I
la trad	Commence Development	00/00/100/	Bird Species
bira	Common Pochara	29/02/1984	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds
	(Ayinya tenna)		Directive >> Annex II, Section 1 bitd Species Protected Species. EU bitds Directive >> Annex III, Section II
			Conservation Concern >> Pirds of Conservation Concern Integrated species, birds of
hird	Common Snino	31/10/2011	Protoctod Spacios: Wildlife Acts 11 Protoctod Spacios: Ell Birds Directive 11 Protoctod Spacios: Ell Birds
DIG		51/12/2011	Directive >> Appex II. Section L Bird Species: L. Protected Species: EU Birds Directive >> Appex III. Section III
	(Gainiago gainiago)		Bird Species 1.1. Threatened Species: Birds of Conservation Concern 1.1. Threatened Species: Birds of
			Conservation Concern >> Birds of Conservation Concern - Amber List
hird	Common Starling (Sturnus	31/12/2011	Protected Species: Wildlife Acts 11 Threatened Species: Birds of Conservation Concern 11 Threatened
ond	vulgaris)	01/12/2011	Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Swift (Apus	31/12/2011	Protected Species: Wildlife Acts 11 Threatened Species: Birds of Conservation Concern 11 Threatened
			Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Wood Pigeon	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: FU Birds
	(Columba palumbus)	,,	Directive >> Annex II, Section Bird Species Protected Species: EU Birds Directive >> Annex III. Section
			Bird Species

Species	Species name	Date of last	Designation
group	Corp Crake (Crev crev)	31/07/1972	Protected Species: Wildlife Acts 1.1. Protected Species: ELL Birds Directive 1.1. Protected Species: ELL Birds
Dird	Com Clare (Clex clex)	51/0//1//2	Directive >> Annex L Bird Species 11 Threatened Species: Birds of Conservation Concern 11 Threatened
			Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Eurasian Curlew	31/12/2011	Protected Species: Wildlife Acts 1.1. Protected Species: FU Birds Directive 1.1. Protected Species: FU Birds
	(Numenius arauata)	01,12,2011	Directive >> Annex II. Section II Bird Species 1.1 Threatened Species: Birds of Conservation Concern 1.1
			Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Eurasian Teal (Anas	31/12/2011	Protected Species: Wildlife Acts 1 Protected Species: EU Birds Directive 1 Protected Species: EU Birds
	crecca)		Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II
	,		Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of
			Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Eurasian Woodcock	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds
	(Scolopax rusticola)		Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III
			Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of
			Conservation Concern >> Birds of Conservation Concern - Amber List
bird	European Golden Plover	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds
	(Pluvialis apricaria)		Directive >> Annex I Bird Species Protected Species: EU Birds Directive >> Annex II, Section II Bird Species
			Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of
			Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation
			Concern - Red List
bird	European Nightjar	31/07/1972	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds
	(Caprimulgus europaeus)		Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened
			Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Great Cormorant	31/12/2011	Protected Species: Wildlite Acts Threatened Species: Birds of Conservation Concern Threatened
	(Phalacrocorax carbo)	01/10/0011	Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Greylag Goose (Anser	31/12/2011	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 4// (Ireland)
	anser)		Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds
			Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II
			Conservation Concern >> Pirds of Conservation Concern Intrediened Species, birds of
bird	Hop Harrior (Circus	21/12/2011	Conservation Concern >> bilds of Conservation Concern - Amber List
DIIG		31/12/2011	Directive >> Appex L Bird Species LL Threatened Species: Birds of Conservation Concern LL Threatened
	Cydneos)		Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Herring Gull (Larus	31/07/1991	Protected Species: Wildlife Acts 11 Threatened Species: Birds of Conservation Concern 11 Threatened
	argentatus)	51/0//1//1	Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	House Martin (Delichon	31/12/2011	Protected Species: Wildlife Acts 11 Threatened Species: Birds of Conservation Concern 11 Threatened
	urbicum)	01,12,2011	Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	House Sparrow (Passer	31/12/2011	Protected Species: Wildlife Acts 11 Threatened Species: Birds of Conservation Concern 11 Threatened
	domesticus)	0171272011	Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Little Egret (Earetta	11/01/2018	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds
	aarzetta)	.,,	Directive >> Annex I Bird Species
bird	Little Grebe	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened
	(Tachybaptus ruficollis)		Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Species group	Species name	Date of last record	Designation
bird	Mallard (Anas platyrhynchos)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Merlin (Falco columbarius)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Mute Swan (Cygnus olor)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Northern Lapwing (Vanellus vanellus)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Northern Wheatear (Oenanthe oenanthe)	31/07/1991	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Peregrine Falcon (Falco peregrinus)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species
bird	Red Grouse (Lagopus lagopus)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Sand Martin (Riparia riparia)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Sky Lark (Alauda arvensis)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Spotted Flycatcher (Muscicapa striata)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Stock Pigeon (Columba oenas)	31/07/1972	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Tufted Duck (Aythya fuligula)	31/07/1991	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Water Rail (Rallus aquaticus)	31/07/1972	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Yellowhammer (Emberiza citrinella)	31/07/1972	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
crustacean	Freshwater White-clawed Crayfish (Austropotamobius pallipes)	28/06/2018	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
fern	Killarney Fern (Trichomanes speciosum)	11/11/1995	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Threatened Species: Vulnerable

Species	Species name	Date of last	Designation
group		record	
insect -	Marsh Fritillary	06/06/2018	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II
butterfly	(Euphydryas aurinia)		Threatened Species: Vulnerable
moss	Large White-moss	14/06/2005	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV
	(Leucobryum glaucum)		Threatened Species: Least concern
terrestrial	Brown Long-eared Bat	11/09/1997	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV
mammal	(Plecotus auritus)		Protected Species: Wildlife Acts
terrestrial	Daubenton's Bat (Myotis	26/08/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV
mammal	daubentonii)		Protected Species: Wildlife Acts
terrestrial	Eurasian Badger (Meles	31/12/2015	Protected Species: Wildlife Acts
mammal	meles)		
terrestrial	Eurasian Red Squirrel	12/09/2016	Protected Species: Wildlife Acts
mammal	(Sciurus vulgaris)		
terrestrial	European Otter (Lutra	01/04/2018	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II
mammal	lutra)		Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
terrestrial	Fallow Deer (Dama	31/12/2008	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species
mammal	dama)		Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland) Protected Species: Wildlife Acts
terrestrial	Lesser Noctule (Nyctalus	14/08/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV
mammal	leisleri)		Protected Species: Wildlife Acts
terrestrial	Pine Marten (Martes	08/04/2021	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V
mammal	martes)		Protected Species: Wildlife Acts
terrestrial	Pipistrelle (Pipistrellus	14/08/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV
mammal	pipistrellus sensu lato)		Protected Species: Wildlife Acts
terrestrial	Sika Deer (Cervus	24/10/2015	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species
mammal	nippon)		Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland) Protected Species: Wildlife Acts
terrestrial	Soprano Pipistrelle	14/08/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV
mammal	(Pipistrellus pygmaeus)		Protected Species: Wildlife Acts
terrestrial	West European	06/06/2021	Protected Species: Wildlife Acts
mammal	Hedgehog (Erinaceus		
	europaeus)		

APPENDIX D



Site Name: Lower River Shannon SAC

Site Code: 002165

This very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120 km. 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. Rivers within the sub-catchment 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 Killeenagarriff, Annagh, Newport, the Dead River, the Bilboa, Glashacloonaraveela, Gortnageragh and Cahernahallia.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1110] Sandbanks
[1130] Estuaries
[1140] Tidal Mudflats and Sandflats
[1150] Coastal Lagoons*
[1160] Large Shallow Inlets and Bays
[1170] Reefs
[1220] Perennial Vegetation of Stony Banks
[1230] Vegetated Sea Cliffs
[1310] Salicornia Mud
[1330] Atlantic Salt Meadows
[1410] Mediterranean Salt Meadows
[3260] Floating River Vegetation
[6410] <i>Molinia</i> Meadows
[91E0] Alluvial Forests*
[1029] Freshwater Pearl Mussel (Margaritifera margaritifera)
[1095] Sea Lamprey (<i>Petromyzon marinus</i>)
[1096] Brook Lamprey (Lampetra planeri)
[1099] River Lamprey (<i>Lampetra fluviatilis</i>)
[1106] Atlantic Salmon (Salmo salar)
[1349] Bottle-nosed Dolphin (Tursiops truncatus)
[1355] Otter (<i>Lutra lutra</i>)

The Shannon and Fergus Rivers flow through Carboniferous limestone as far as Foynes, but west of Foynes Namurian shales and flagstones predominate (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 Pallas Green, passes through an area of Rhyolites, Tuffs and Agglomerates.

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 Maigue River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulnasherry 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. Poulnasherry Bay is stony and unusually rich in species and biotopes. Plant species are typically scarce on the mudflats, although there are some eelgrass (*Zostera* spp.) beds 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. For example, 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 triqueter*), 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 Sea-spurrey

(*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 species Common Saltmarsh-grass (*P. maritima*) and Hard-grass (*Parapholis strigosa*).

Saltmarsh vegetation also occurs around a number of lagoons within the site, two of which have been surveyed as part of a National Inventory of Lagoons. 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* subsp. *maritima*), Sea Campion (*Silene vulgaris* subsp. *maritima*), Thrift and plantains (*Plantago* spp.). A rare endemic type of sea-lavender, *Limonium recurvum* subsp. *pseudotranswallianum*, 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 Common 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.

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 sublittoral fringe and strong populations of the Purple Sea Urchin *Paracentrotus lividus* are found. The communities found are tolerant to sand scour and tidal streams. The infralittoral 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 18 m. Below this it becomes rare and the community is characterised by coralline crusts and red foliose algae.

Other coastal habitats that occur within the site include stony beaches and bedrock shores (these support a typical zonation of seaweeds such as *Fucus* spp., *Ascophyllum nodosum* and kelps), shingle beaches (with 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 (e.g. in the area from Kerry Head to Beal Head) and sand dunes (a small area occurs at Beal Point, where Marram – *Ammophila arenaria* is the dominant species).

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 is broad, generally slow flowing and naturally eutrophic; the Fergus is 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. Semi-natural habitats, such as wet grassland, wet woodland and marsh occur by the rivers, but improved grassland is the most common habitat type. 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 (*Juncus* spp.) and sedges (*Carex* spp.), and supporting a diverse and species-rich vegetation, including such uncommon species as Blue-eyed Grass (*Sisyrinchium bermudiana*) and Pale Sedge (*C. pallescens*).

Floating river vegetation characterised by species of water-crowfoot (*Ranunculus* spp.), pondweeds (*Potamogeton* spp.) and the moss *Fontinalius 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 Co. 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 50 m 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 Rusty Willow (*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 river side 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 Pedunculate Oak (*Quercus robur*), elm (*Ulmus glabra* and *U. procera*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and

the shrubs Guelder-rose (*Viburnum opulus*) and willows. The ground flora is species-rich.

While woodland is infrequent within the site, however Cahiracon Wood contains a strip of old oak woodland. Sessile Oak (*Q. 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 telmeteia*) 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 2 km 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 features prominent Great wood-rush and Bilberry (*Vaccinium myrtillus*), along with a typical range of woodland herbs. Bracken (*Pteridium aquilinum*) is a feature in areas where there is more light available.

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 approximately 5 km north-west of Cappamore in Co. Limerick. The bog contains some wet areas with good cover of bog mosses (*Sphagnum* spp.). Species of particular interest include Cranberry (*Vaccinium oxycoccos*) and White Sedge (*Carex curta*), along with two regionally rare mosses, including the bog moss *S. fimbriatum*. The site is being invaded by Downy Birch (*Betula pubescens*) scrub woodland. Both commercial forestry and the spread of Rhododendron (*Rhododendron ponticum*) has greatly reduced the overall value of the site.

A number of plant species that are listed in the Irish Red Data Book occur within the site, and several of these are protected under the Flora (Protection) Order, 1999. These include Triangular Club-rush (*Scirpus triquetrus*), a species which is only found in Ireland only in the Shannon Estuary, where it borders creeks in the inner estuary. Opposite-leaved Pondweed (*Groenlandia densa*) is found in the Shannon where it passes through Limerick City, while Meadow Barley (*Hordeum secalinum*) is abundant in saltmarshes at Ringmoylan and Mantlehill. Hairy Violet (*Viola hirta*) occurs in the Askeaton/Foynes area. Golden Dock (*Rumex maritimus*) is noted as occurring in the River Fergus estuary. Finally, Bearded Stonewort (*Chara canescens*), a brackish water specialist, and Convergent Stonewort (*Chara connivens*) are both found in Shannon Airport Lagoon.

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 Bartailed Godwit (476; 1995/96). In the past, three separate flocks of Greenland Whitefronted 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 (1,062; 1995/96), Curlew (1,504; 1995/96), Redshank (3,228; 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 Peregine 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 (4,010 individuals at Loop Head, 1987).

There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary. This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. The population is estimated (in 2006) to be 140 ± 12 individuals. 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 species 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 over-grazing 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 where it reflects the sewage load from Limerick City. Analyses for trace metals suggest a relatively clean estuary with no influences of 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 habitats lagoon and alluvial woodland, 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.