

Proposed Bridge Rehabilitation Programme 2020 Mohernagh Bridge, Co. Limerick



Screening for Appropriate Assessment Report

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Tait Business Centre, Dominic Street, Limerick City, Ireland.
t. +353 61 313519, f. +353 61 414315
e. info@ecofact.ie
w. www.ecofact.ie

SUMMARY

The current document provides a Screening for Appropriate Assessment Report of the Proposed Rehabilitation Programme 2020 for Mohernagh Bridge, Co. Limerick. Limerick City & County Council propose to undertake rehabilitation works at 15 bridges in Co. Limerick in 2020. Each bridge is being subject to its own Screening for Appropriate Assessment Report. This report assesses whether the proposed works at Mohernagh bridge are likely to have a significant effect on the Natura 2000 site network.

Mohernagh Bridge in Co. Limerick is located over the River Owvane which eventually flows into the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA, both c. 7.2rkm downstream. As the bridge is located this far upstream of the SAC and SPA, it is unlikely that impacts will affect this far downstream. However, due to the direct hydrological connection with the SAC and SPA, the precautionary principle must be applied. Additionally, there is the potential for Otters, Salmon and Brook / River lampreys to use the River Owvane. Basic water quality mitigation is required and cannot be provided in a Screening for Appropriate Assessment. There is no potential for impacts affecting the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA c. 295m south as there is no optimal breeding habitat nearby and the works are small scale regarding the bridge only.

From examination of the information available, it is concluded that there is the potential for indirect and cumulative impacts arising from the proposed bridge works at Mohernagh Bridge in Co. Limerick. Mitigation measures are required and cannot be provided in a Screening for Appropriate Assessment report. Therefore, a **Natura Impact Statement is required for the proposed bridge works.**

Regarding other ecological interests, vegetation clearance works should be undertaken outside of the bird nesting season. Water quality protection measures will be required. No other recommendations are required.

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1. INTRODUCTION

The current document provides a Screening for Appropriate Assessment Report of the Proposed Rehabilitation Programme 2020 for Mohernagh Bridge, Co. Limerick. Limerick City & County Council propose to undertake rehabilitation works at 15 bridges in Co. Limerick in 2020. Each bridge is being subject to its own Screening for Appropriate Assessment Report. This report assesses whether the proposed works at Mohernagh bridge are likely to have a significant effect on the Natura 2000 site network. Effects upon the conservation objectives and qualifying interests (including habitats and species) within the affected designated areas are considered.

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) or the Birds Directive (2009). This report assesses whether this development is likely to have a significant effect on the Natura 2000 site network. Effects upon the conservation objectives and qualifying interests (including habitats and species) within the affected designated areas are considered. 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 works, alone or in combination with other plans and projects, is likely to have significant effects on 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

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora - '*The Habitats Directive*', has been transposed into Irish law by The European Community (Natural Habitats) Regulations 1997 (S.I. No. 94/1997).

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 publically available sources:

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

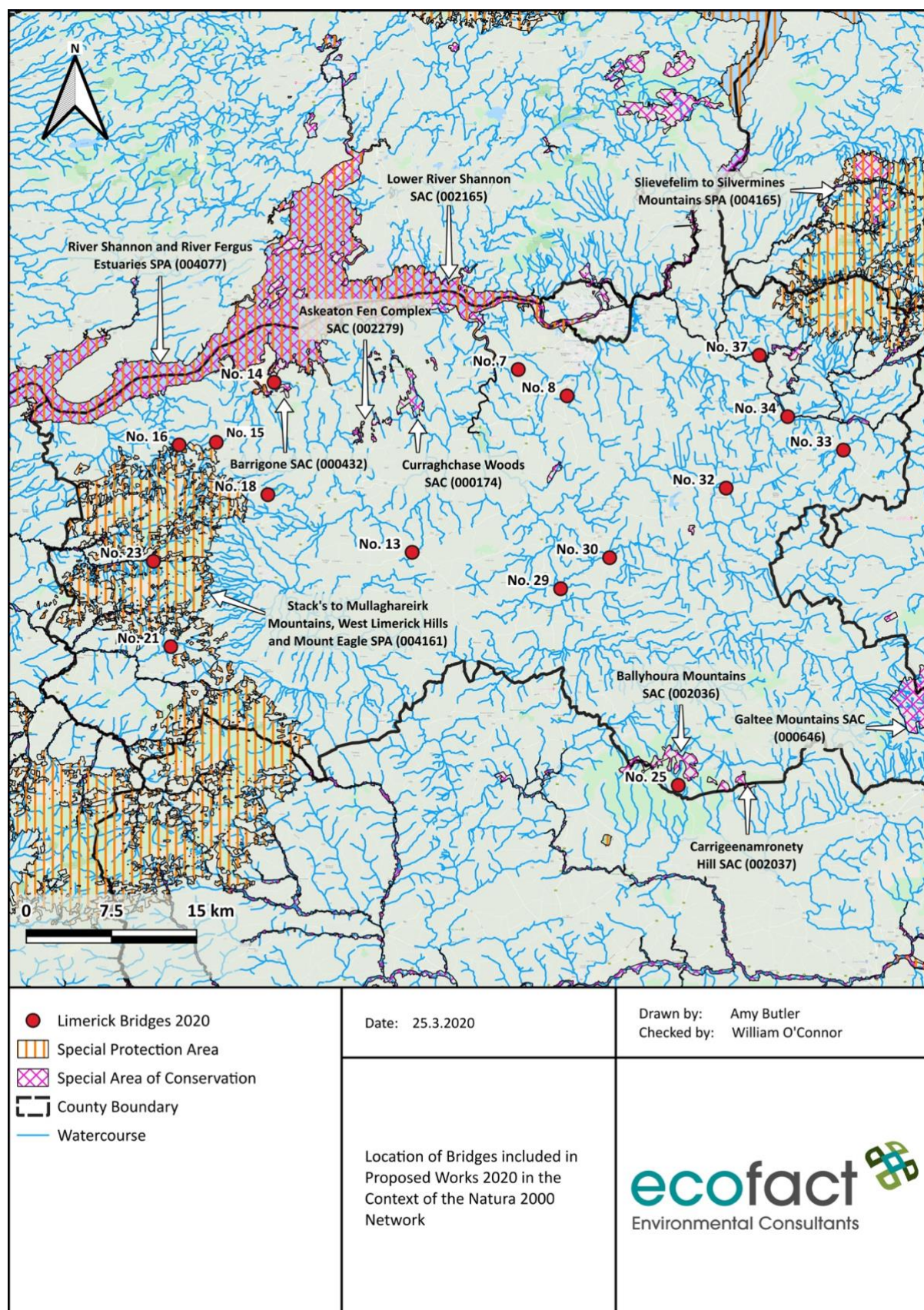


Figure 1 Location of Bridges included in Proposed Works 2020 in the Context of the Natura 2000 network (Mohernagh Bridge is No.16).

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 development site, including the Lower River Shannon SAC, the River Shannon and River Fergus Estuaries SPA and the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. The desktop study identified the qualifying interests (species and habitats) relevant to the designated sites within the area.

A review of published literature was undertaken in order to collate data on the receiving environment; a range of additional sources of information including scientific reports produced by, and information on the websites of the EPA and NPWS were also reviewed. 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. 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 current Screening Assessment follows the guidance 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*'. Based on these guidelines, the Appropriate Assessment process is a four staged approach described below:

Stage One: Screening / Test of Significance - the process which identifies the likely impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;

Stage Two: Appropriate Assessment - the consideration of the impact of the project or plan on the integrity of the Natura 2000 site, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

Stage Three: Assessment of Alternative Solutions - the process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site; and

Stage Four: Assessment Where Adverse Impacts Remain - an assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

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 located upstream of the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA and c. 295m from the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle 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

Limerick City & County Council proposed to undertake rehabilitation works at 15 bridges as part of the Rehabilitation Programme for 2020. Mohernagh bridge is noted as a white river bridge crossing. Both parapets are required to be inspected and repaired or replaced. It is also noted that the edge of the bridge deck has evidence of disrepair, and the structure is to be assessed when river levels subside. For 2020 it is proposed to only design the repairs.

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 Rehabilitation works at Mohernagh Bridge, Co. 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 works at Mohernagh Bridge in Co. Limerick in the context of the Natura 2000 network is indicated in Figure 2. Special Areas of Conservation (SAC's) 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). Special Protection Areas (SPA's) for birds are designated based on the presence of internationally significant populations of bird species, listed in Annex I of the EU Birds Directive (2009).

Special Areas of Conservation (SAC) and Special Protection Areas (SPAs) considered in the current screening are listed in Table 1. Mohernagh bridge is located c.295m from the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. The bridge is also located c. 7.2rkm upstream of both the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. These sites will be considered further in relation to potential impacts arising from the proposed works.

In relation to the other Natura 2000 sites within 15km of the proposed works, the Barrigone SAC is located c. 9.6km northeast. There are no potential pathways for impacts on this site.

4.2.1 Lower River Shannon SAC

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 and the estuarine section of the River from Clarecastle to its confluence with the River Shannon is also part of the River Shannon and River Fergus 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. One of the most important estuarine saltmarshes of the Lower River Shannon SAC is in the vicinity of the Fergus Estuary. There are two scarce flora species which occur in this area, *Puccinellia foucaudii* and *Parapholis strigosa*. Golden dock *Rumex maritimus*, a 'Near Threatened' species listed in the Irish Red Data Book, also occurs in the Fergus Estuary (Nelson *et al.* 2019). The lower reaches of the River Fergus is important for spring salmon (NPWS, 2013). The Estuary supports a significant number of wintering waterfowl too. 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).

4.2.3 Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is a very large site centred on the borders between the counties of Cork, Kerry and Limerick. The site is skirted by the towns of Newcastle West, Ballydesmond, Castleisland, Tralee and Abbeyfeale. The site consists of a variety of upland habitats, though almost half is afforested. The coniferous forests include first and second rotation plantations, with both pre-thicket and post-thicket stands present. Substantial areas of clear-fell are also present at any one time. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier.

Table 1 Summary details of the designated Natura 2000 sites within 15km of the proposed works at Mohernagh Bridge, Co. Limerick considered in the current screening.

| Natura 2000 Site | Conservation Interests | Included in the current Assessment (Yes/No) | Screening Distance (km) |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161) | Hen harrier (Circus cyaneus) [A082] | Yes – in close proximity to bridge works – unlikely to be impacted due to nature of the bridge works – but potential pathway for impacts | 295m south west |
| Lower River Shannon SAC (002165) | Sandbanks which are slightly covered by sea water all the time [1110] | Yes – could be present c. 7.2rkm downstream – potential pathway for impacts | 7.2rkm downstream |
| | Estuaries [1130] | Yes – present c. 7.2rkm downstream – potential pathway for impacts | |
| | Mudflats and sandflats not covered by seawater at low tide [1140] | Yes – present c. 7.2rkm downstream – potential pathway for impacts | |
| | Coastal lagoons [1150] | Yes – present c. 8.5km downstream in the estuary – impacts unlikely but potential pathway for impacts | |
| | Large shallow inlets and bays [1160] | Yes – present c. 8rkm downstream – potential pathway for impacts | |
| | Reefs [1170] | Yes – present c. 9km downstream in the estuary – impacts unlikely but potential pathway for impacts | |
| | Perennial vegetation of stony banks [1220] | No – terrestrial habitat on the edges of the estuary – geographical separation – no potential pathway for impacts | |
| | Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] | No – terrestrial habitat on the edges of the estuary – geographical separation – no potential pathway for impacts | |
| | Salicornia and other annuals colonising mud and sand [1310] | No – present elsewhere in the estuary according to NPWS Conservation objectives maps – no potential pathway for impacts due to distance | |
| | Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] | No – present elsewhere in the estuary according to NPWS Conservation objectives | |

| | | | |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| | | maps – no potential pathway for impacts due to distance | |
| | Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] | No – present elsewhere in the estuary according to NPWS Conservation objectives maps – no potential pathway for impacts due to distance | |
| | Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] | No – no known presence downstream according to NPWS conservation objectives maps | |
| | <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] | No – terrestrial habitat – not present at the site – geographical separation - no potential pathway for impacts | |
| | 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] | No – terrestrial habitat – not present at the site – geographical separation - no potential pathway for impacts | |
| | <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] | No – only present in this SAC in the River Cloon – no downstream hydrological connection – no potential pathway for impacts | |
| | <i>Petromyzon marinus</i> (Sea Lamprey) [1095] | Yes – could be present downstream – potential pathway for impacts | |
| | <i>Lampetra planeri</i> (Brook Lamprey) [1096] | Yes – could be present at the site or downstream – potential pathway for impacts | |
| | <i>Lampetra fluviatilis</i> (River Lamprey) [1099] | Yes – could be present at the site or downstream – potential pathway for impacts | |
| | <i>Salmo salar</i> (Salmon) [1106] | Yes – could be present at site or downstream – potential pathway for impacts | |
| | <i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349] | Yes – current range according to NPWS conservation objectives maps is c. 8rkm downstream in the estuary – potential pathway for impacts | |
| | <i>Lutra lutra</i> (Otter) [1355] | Yes – could be present downstream – potential pathway for impacts | |
| River Shannon and River Fergus Estuaries SPA (004077) | Cormorant (<i>Phalacrocorax carbo</i>) [A017] | No – geographical separation – no potential pathway for impacts | 7.2rkm downstream |
| | Whooper Swan (<i>Cygnus cygnus</i>) [A038] | No – geographical separation – no potential pathway for impacts | |
| | Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] | No – geographical separation – no potential pathway for impacts | |
| | Shelduck (<i>Tadorna tadorna</i>) [A048] | No – geographical separation – no potential pathway for impacts | |
| | Wigeon (<i>Anas penelope</i>) [A050] | No – geographical separation – no potential pathway for impacts | |
| | Teal (<i>Anas crecca</i>) [A052] | No – geographical separation – no potential pathway for impacts | |

| | | | |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------|
| | Pintail (Anas acuta) [A054] | No – geographical separation – no potential pathway for impacts | |
| | Shoveler (Anas clypeata) [A056] | No – geographical separation – no potential pathway for impacts | |
| | Scaup (Aythya marila) [A062] | No – geographical separation – no potential pathway for impacts | |
| | Ringed Plover (Charadrius hiaticula) [A137] | No – geographical separation – no potential pathway for impacts | |
| | Golden Plover (Pluvialis apricaria) [A140] | No – geographical separation – no potential pathway for impacts | |
| | Grey Plover (Pluvialis squatarola) [A141] | No – geographical separation – no potential pathway for impacts | |
| | Lapwing (Vanellus vanellus) [A142] | No – geographical separation – no potential pathway for impacts | |
| | Knot (Calidris canutus) [A143] | No – geographical separation – no potential pathway for impacts | |
| | Dunlin (Calidris alpina) [A149] | No – geographical separation – no potential pathway for impacts | |
| | Black-tailed Godwit (Limosa limosa) [A156] | No – geographical separation – no potential pathway for impacts | |
| | Bar-tailed Godwit (Limosa lapponica) [A157] | No – geographical separation – no potential pathway for impacts | |
| | Curlew (Numenius arquata) [A160] | No – geographical separation – no potential pathway for impacts | |
| | Redshank (Tringa totanus) [A162] | No – geographical separation – no potential pathway for impacts | |
| | Greenshank (Tringa nebularia) [A164] | No – geographical separation – no potential pathway for impacts | |
| | Black-headed Gull (Chroicocephalus ridibundus) [A179] | No – geographical separation – no potential pathway for impacts | |
| | Wetland and Waterbirds [A999] | Yes – downstream hydrological connection – potential pathway for impacts | |
| Barrigone SAC (000432) | Juniperus communis formations on heaths or calcareous grasslands [5130] | No – terrestrial habitat – geographical separation – no potential pathway for impacts | 9.6km northeast |
| | Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] | No – terrestrial habitat – geographical separation – no potential pathway for impacts | |
| | Limestone pavements [8240] | No – terrestrial habitat – geographical separation – no potential pathway for impacts | |
| | Euphydryas aurinia (Marsh Fritillary) [1065] | No – terrestrial species not present at the site – geographical separation – no potential pathway for impacts | |

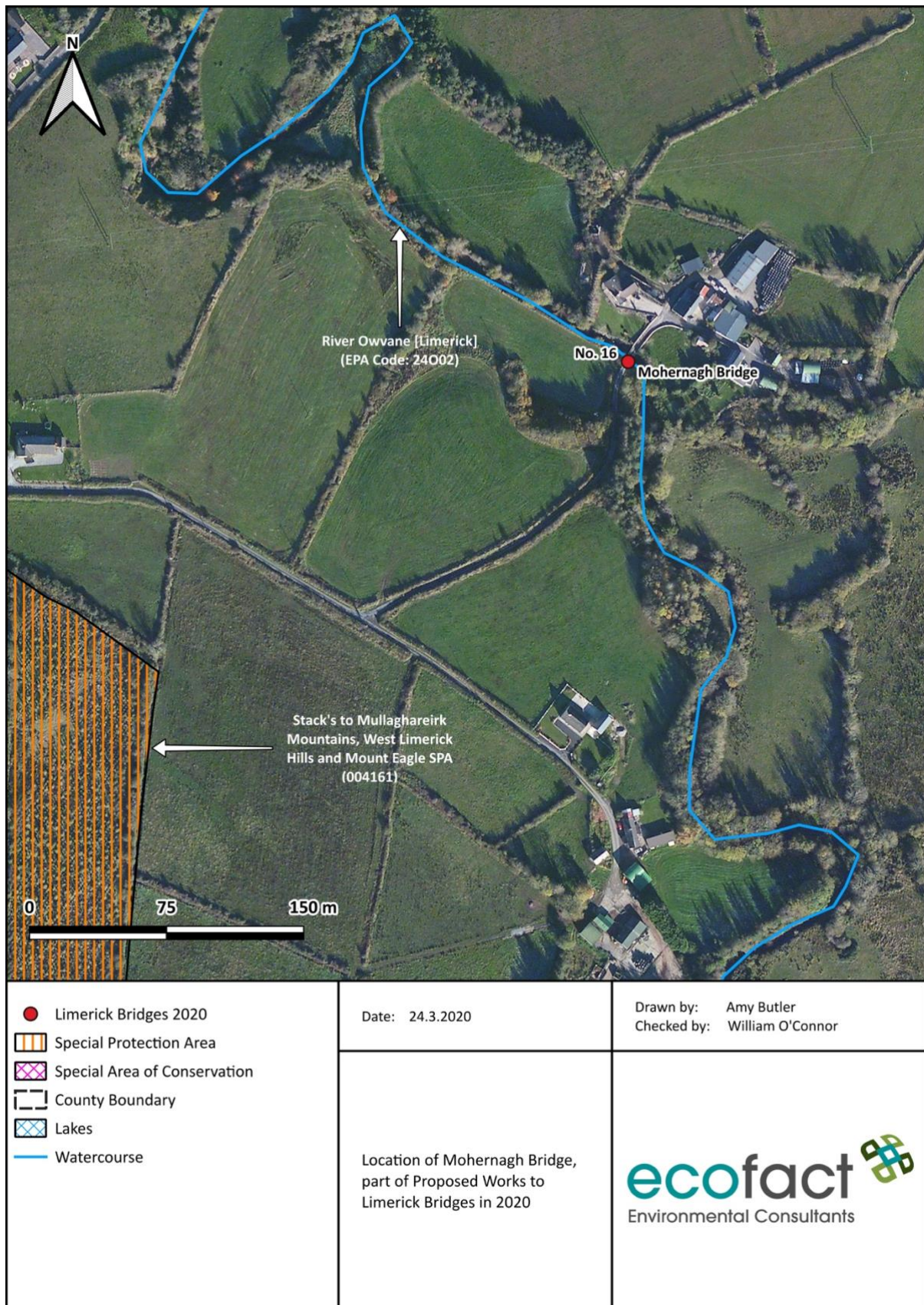


Figure 2 Location of Mohernagh Bridge, part of Proposed Works to Limerick Bridges in 2020.

5. ASSESSMENT OF EFFECTS

The potential direct, indirect and cumulative impacts on Natura 2000 sites identified in section 4 resulting from the proposed rehabilitation works at Mohernagh Bridge in Co. Limerick are discussed below.

5.1 Assessment of potential direct impacts affecting Natura 2000 sites

5.1.1 Construction Phase

There would be no direct construction phase impacts arising from the proposed works at Mohernagh Bridge as this bridge 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 works at Mohernagh Bridge as this bridge site is not located within any Natura 2000 site and is located at a distance from the Natura 2000 network.

5.2 Assessment of 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

Potential indirect construction phase impacts generally concern water quality impacts that could affect the aquatic or semi-aquatic qualifying interests of the Lower River Shannon SAC c. 7.2km downstream of the works, as well as the Wetland and Waterbirds habitat in the River Shannon and River Fergus Estuaries SPA also c. 7.2km downstream. Potential water quality impacts concern increased siltation and turbidity during the works, as well as accidental spillages of oils or fuels from machinery, if required. Given the distance between the works and the SAC and SPA downstream, it is unlikely given the small scale that these impacts would have an effect this far downstream. However, the precautionary approach must be taken and there is also the potential for Otters, Salmon or Brook / River lampreys to use the River Owvane at the site. Some basic mitigation measures will be required to avoid potential impacts on water quality. Mitigation cannot be provided in a Screening for Appropriate Assessment.

There is also the potential for invasive species impacts to arise. However, this is considered to be a localised impact and would not have the potential to affect the SAC or SPA at a distance of 7.2km downstream of the works.

There is no suitable Hen harrier breeding habitat at Mohernagh Bridge. The surrounding land use is mainly agricultural and residential. Although it cannot be ruled out that Hen harrier may forage in the area at a distance of 295m from the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, it is considered that due to the nature of the works there would be no construction phase disturbance impacts. The site is not considered to have optimal foraging habitat for this protected bird. The works are small scale at this bridge site over a stream. There is no potential for these works to

cause likely disturbance impacts to Hen Harrier designated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

5.2.2 Operational Phase

As the bridge is an existing bridge, there is no potential for indirect operational phase impacts to arise as a result of the proposed rehabilitation works. There will be no change of use for the bridge site.

5.3 Assessment of 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).

The standard data Natura 2000 form for the Lower River Shannon SAC lists the threats and pressures currently having an impact on this protected site. There are no impacts listed that are having a high impact on this SAC. The following are noted as having a medium impact on the SAC: Fertilisation, urbanised areas, human habitation, air pollution, air-borne pollutants, discharges, eutrophication (natural), grazing, polderisation, reclamation of land from sea, estuary or marsh. The standard data Natura 2000 form for the River Shannon and River Fergus Estuaries SPA notes the following as having a high impact on the SPA: Industrial or commercial areas, Discharges, Fertilisation, Urbanised areas and human habitation. The Natura 2000 form for the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA notes the existing pressures as Sylviculture, forestry and peat extraction.

The potential for water quality impacts described above could indeed act in combination with existing background pressures on water quality within the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. The proposed bridge works could act in combination with fertilisation and discharge impacts which also affect water quality in the SAC and SPA. Taking the precautionary principle, due to the hydrological connection with the SAC and SPA, basic mitigation measures will be required in order to reduce the potential for impacts. Mitigation cannot be provided in a Screening for Appropriate Assessment Report. It is considered that with basic water quality mitigation this will also reduce the potential for cumulative impacts on the SAC and SPA c. 7.2km downstream. The proposed bridge works would not add cumulatively to impacts affecting the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, involving peat extraction, sylviculture and forestry as the works are not connected with such activities.

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 the potential for indirect and cumulative impacts arising from the proposed bridge works at Mohernagh Bridge in Co. Limerick. It has been determined that basic water quality mitigation is required for the proposed works at Mohernagh Bridge to reduce the potential for impacts on the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA, both c. 7.2km downstream. Mitigation measures cannot be provided in a Screening for Appropriate Assessment report. Therefore, **it is concluded that a Natura Impact Statement is required for the proposed rehabilitation works at Mohernagh Bridge.**

7. OTHER ECOLOGICAL INTERESTS

7.1 Methodology

An daytime bat survey was completed at the bridge site to determine the potential for bat usage. The survey had regard to the methodology outlined in *Bat Mitigation Guidelines for Ireland* by Kelleher & Marnell (2006) and *Bat Surveys for Professional Ecologists: Good Practice Guidelines* by Collins (2016). The bridge on the site was inspected for its potential to have bats where access allowed. Any potential cracks, crevices in the bridge structure were noted. Any evidence of bat usage and / or habitation such as droppings, staining or smearing lines were also identified.

A walkover survey was also completed at the site. This general walkover survey comprised an overview of the ecological features of the site. The habitats in the immediate vicinity of the bridge were assessed, including the aquatic habitat present at the site. Checks for signs of mammal usage and potential dwellings were also carried out. In addition, checks for the presence of birds' nests at the bridge were also completed.

7.2 Results

The National Biodiversity Data Centre (NBDC) maps landscape suitability for bats based on Lundy *et al.*, (2011). The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats. Table 1 below gives the suitability of the study area for the bat species found in Ireland (based on NBDC) along with their Irish Red List Status (from Marnell *et al.*, 2009). The overall assessment of bat habitats for the current study area is given as 32.67.

Table 2 Bat suitability index for Mohernagh bridge, with Irish Red List status also indicated.

| Common name | Scientific name | Suitability index | Irish red list status |
|----------------------|----------------------------------|-------------------|-----------------------|
| All bats | - | 32.67 | |
| Soprano pipistrelle | <i>Pipistrellus pygmaeus</i> | 43 | Least Concern |
| Brown long-eared bat | <i>Plecotus auritus</i> | 44 | Least Concern |
| Common pipistrelle | <i>Pipistrellus pipistrellus</i> | 42 | Least Concern |
| Lesser horseshoe bat | <i>Rhinolophus hipposideros</i> | 20 | Least Concern |

| | | | |
|-------------------------|------------------------------|----|-----------------|
| Leisler's bat | <i>Nyctalus leisleri</i> | 40 | Near Threatened |
| Whiskered bat | <i>Myotis mystacinus</i> | 17 | Least Concern |
| Daubenton's bat | <i>Myotis daubentonii</i> | 33 | Least Concern |
| Nathusius's pipistrelle | <i>Pipistrellus nathusii</i> | 23 | Least Concern |
| Natterer's bat | <i>Myotis nattererii</i> | 32 | Least Concern |

No evidence of bats was found during the current survey. There were no crevices noted as having bat potential as the bridge has a flat and smooth structure with no gaps that could be used by bats. No bat droppings, staining, or smearing lines or evidence of insect remains that could be left over from bat foraging were found during the survey. **No derogation license will be required for the bridge works in relation to bats. No further surveys are required.**

No birds nests were recorded during the current survey in the immediate vicinity of the bridge. No suitable habitat for any birds of conservation concern was noted. If vegetation clearance is required, the works should be undertaken outside of the bird nesting season, which is from the 1st of March to the 31st of August.

No signs of mammal activity were noted during the survey. No mammal dwellings were identified. It is possible that mammals may use this watercourse for commuting. However, it is not considered to be of any particular ecological importance. **No derogation licenses are required in relation to mammals.**

The River Owvane at the site was noted to have suitable habitat for salmonids. There is no spawning habitat at the site however. It is likely that Brown trout are present and Salmon may also use this watercourse. These species require good water quality to survive and there is the potential for water quality impacts to arise affecting these species. Water quality impacts could affect salmonids in this stream and **mitigation to protect water quality is required.**

7.3 Recommendations

Regarding other ecological interests, vegetation clearance works should be undertaken outside of the bird nesting season. Water quality protection measures will be required. No other recommendations are required.

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PLATES



Plate 1 Mohernagh Bridge in Co. Limerick.



Plate 2 River Owvane at Mohernagh bridge.

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, Tuffs and Agglomerates. Rivers within the subcatchment of the Feale include the Galey, Smearlagh, Oolagh, Allaughaun, Owveg, Clydagh, Caher, Breanagh and Glenacarneay. 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 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 (*Glauca 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 sublittoral fringe and strong populations of *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 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 a 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 landuses 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: STACKS TO MULLAGHAREIRK MOUNTAINS, WEST LIMERICK HILLS AND MOUNT EAGLE SPA
SITE CODE: 004161

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is a very large site centred on the borders between the counties of Cork, Kerry and Limerick. The site is skirted by the towns of Newcastle West, Ballydesmond, Castleisland, Tralee and Abbeyfeale. The mountain peaks included in the site are not notably high or indeed pronounced, the highest being at Knockfeha (451 m). Other mountains included are Mount Eagle, Knockanefune, Garraunbaun, Taur, Rock Hill, Knockacummer, Mullaghmuish, Knight's Mt, Ballincollig Hill, Beennageeha Mt, Sugar Hill, Knockanimpuba and Knockathea, amongst others. Many rivers rise within the site, notably the Blackwater, Owentaraglin, Owenkeal, Glenlara, Feale, Clydagh, Allaghaun, Allow, Oolagh, Galey and Smerlagh.

The site consists of a variety of upland habitats, though almost half is afforested. The coniferous forests include first and second rotation plantations, with both pre-thicket and post-thicket stands present. Substantial areas of clear-fell are also present at any one time. The principal tree species present are Sitka Spruce (*Picea sitchensis*) and Lodgepole Pine (*Pinus contorta*). A substantial part (28%) of the site is unplanted blanket bog and heath, with both wet and dry heath present. The vegetation of these habitats is characterised by such species as Ling Heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Common Cottongrass (*Eriophorum angustifolium*), Hare's-tail Cottongrass (*Eriophorum*

vaginatum), Deergrass (*Scirpus cespitosus*) and Purple Moor-grass (*Molinia caerulea*). The remainder of the site is mostly rough grassland that is used for hill farming. This varies in composition and includes some wet areas with rushes (*Juncus* spp.) and some areas subject to scrub encroachment.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier.

This SPA is a stronghold for Hen Harrier and supports the largest concentration of the species in the country. A survey in 2005 recorded 45 pairs, which represents over 20% of the all-Ireland total. A similar number of pairs had been recorded in the 1998-2000 period. The mix of forestry and open areas provides optimum habitat conditions for this rare bird, which is listed on Annex I of the E.U. Birds Directive. The early stages of new and second-rotation conifer plantations are the most frequently used nesting sites, though some pairs may still nest in tall heather of unplanted bogs and heath. Hen Harriers will forage up to c. 5 km from the nest site, utilising open bog and moorland, young conifer plantations and hill farmland that is not too rank. Birds will often forage in openings and gaps within forests. In Ireland, small birds and small mammals appear to be the most frequently taken prey.

Short-eared Owl, a very rare species in Ireland, has been known to breed within the site. Nesting certainly occurred in the late 1970s and birds have been recorded intermittently since. The owls are considered to favour this site due to the presence of Bank Voles, a favoured prey item. Merlin also breed within the site but the size of the population is not known. Red Grouse is found on some of the unplanted areas of bog and heath – this is a species that has declined in Ireland and is now Red-listed. The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is of ornithological importance because it provides excellent nesting and foraging habitat for breeding Hen Harrier and is one the top sites in the country for the species. The presence of three species, Hen Harrier, Merlin and Short-eared Owl, which are listed on Annex I of the E.U. Birds Directive is of note.

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 triqueter*).

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.