# N5 Ballaghaderreen to Scramoge Road Project

# Appropriate Assessment Screening Report

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## Appropriate Assessment Screening Report

## TABLE OF CONTENTS

**1. INTRODUCTION ..... 1**
1.1 General Introduction ..... 1
**2. DESCRIPTION OF PROJECT ..... 2**
2.1 Site Location ..... 2
2.2 Description of the Proposed Road Development ..... 2
**3. IDENTIFICATION OF RELEVANT EUROPEAN SITES ..... 4**
3.1 Background to European Sites ..... 4
3.1.1 European Sites ..... 4
3.2 European Sites in the Zone of Impact of the Proposed N5 ..... 5
**4. ASSESSMENT OF LIKELY EFFECTS ON EUROPEAN SITES ..... 12**
4.1 Article 6(3) Assessment Criteria ..... 12
4.1.1 Description of the Individual Elements of the Project with Potential to give Rise to Impacts on European Sites ..... 12
4.1.2 Description of any Likely Direct, Indirect or Secondary Impacts of the Project on the European Sites ..... 13
4.1.3 Cumulative Impacts ..... 16
4.1.4 Description of any Likely Changes to European Sites ..... 24
4.1.5 Description of any Potential Impacts on any European Site ..... 25
4.1.6 Indicators of Significance as a Result of the Identification of Effects ..... 25
**5. ARTICLE 6(3) SCREENING STATEMENT AND CONCLUSIONS ..... 27**
5.1 The findings of this Screening Report are presented in the following sections ..... 27
5.2 Description of Project ..... 27
5.3 Potential for Effects on European Sites ..... 27
5.3.1 Sites that are 'Screened In' ..... 27
5.3.2 Sites that are 'Screened Out' ..... 30
5.4 Data Collected to Carry Out Assessment ..... 34
5.5 Overall Conclusions ..... 34
**6. BIBLIOGRAPHY ..... 35**

**APPENDIX I Assessing Connectivity with SPAs, Scottish Natural Heritage, 2013**

**APPENDIX II NPWS Site Synopses**

# 1. INTRODUCTION

## 1.1 General Introduction

McCarthy Keville O'Sullivan Ltd. has been appointed to prepare a report to provide the information necessary to allow the competent authority to conduct an Article 6(3) Screening for Appropriate Assessment of the proposed N5 Ballaghaderreen to Scramoge Road development, as transposed into Irish law and in particular pursuant to the provisions of Article 250 of the Planning and Development Regulations 2001 as inserted by SI 476 of 2011 being the Planning and Development (Amendment) (no. 3) Regulations, 2011(hereinafter referred to as "Article 250") i.e. to assess, in view of best scientific knowledge, if the proposed road development, individually or in combination with other plans and projects, would be likely to have a significant effect on any European site(s) (hereinafter referred to as an Article 6(3) Appropriate Assessment Screening).

This report provides the information necessary to allow the competent authority to conduct an Article 6(3) Appropriate Assessment Screening of the proposed development.

This is a national road project which is not directly connected with or necessary for the management of any European Site.

Screening for Appropriate Assessment is required under and in accordance with the national provisions (including Article 250 of the Planning and Development Regulations, 2001 as amended) transposing Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Where it cannot be objectively concluded that a project or plan, either alone or in combination with other projects or plans, is not likely to have significant effects on a European Site then same shall be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives.

The assessment in this report is based on a desk study and field surveys and utilises data collected during 2014, 2015 & 2016. It specifically assesses the potential for the proposed road alignment to impact on European sites.

This report has been prepared in accordance with the European Commission guidance document *Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC* (EC, 2001) and the Department of the Environment's Guidance on the Appropriate Assessment of Plans and Projects in Ireland (December 2009, amended February 2010).

In addition to the guidelines referenced above, the following relevant guidance was considered in preparation of this report:

(1) DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government,

(2) European Communities (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,

(3) 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,

(4) EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission,

(5) EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission,

(6) EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements. Environmental Protection Agency,

(7) EPA (2003), Advice Notes on current practice in the preparation of Environmental Impact Statements. Environmental Protection Agency, and

(8) CIEEM (2016) Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment.

(9) EC (2001) Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

(10) NRA (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes – National Roads Authority.

# 2. DESCRIPTION OF PROJECT

## 2.1 Site Location

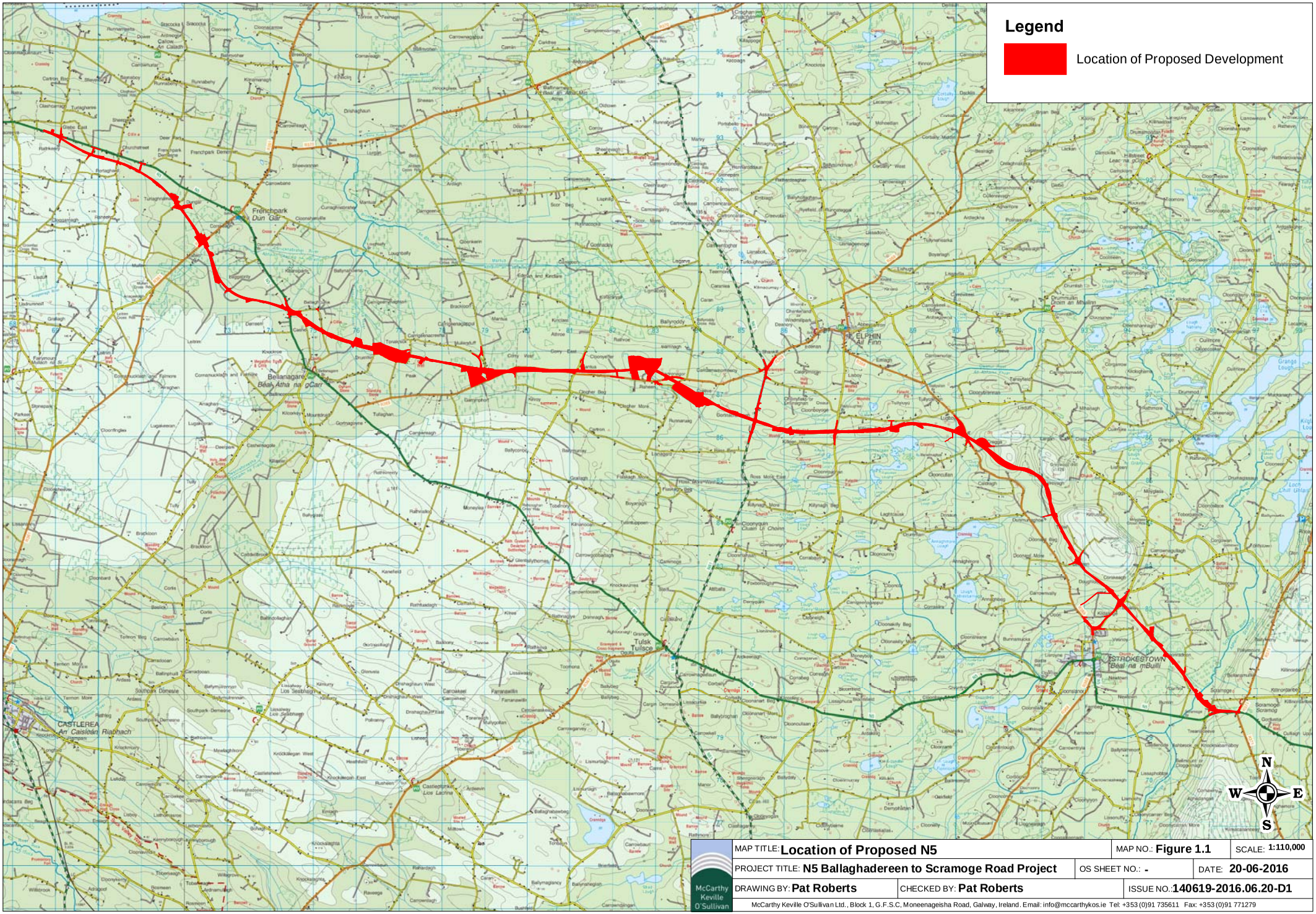
The proposed N5 Ballaghaderreen to Scramoge Road Project ("the proposed road development") extends from the townland of Rathkeery (Grid Ref: E169065 N293002), located west of Frenchpark, to the townland of Scramoge, east of Strokestown (Grid Ref:196117 N279615), where the proposed route will tie into the existing N5. The Proposed N5 is presented in Figure 1.1.

The proposed road development is approx. 34km long. It commences at the tie-in with the recently completed N5 Ballaghaderreen Bypass before passing to the south of the existing N5. The route passes south of Frenchpark where it crosses the R361 (Williamstown to Boyle) Regional Road. It crosses the N5 at Cashel Townland northwest of Bellanagare. It remains north of Bellanagare and Tulsk, crossing the N61 (Athlone to Boyle) road near Shankill Cross. It continues north of Clooncullaan Lough before crossing the R368 (Elphin to Strokestown) at Lugboy townland where it veers south running parallel to the R368 to bypass Strokestown to the north and east. It re-joins the existing N5 at Scramoge to the east of Strokestown.

## 2.2 Description of the Proposed Road Development

A description of the type of road that is proposed is provided below. The Appropriate Assessment Screening is based on the provision of a road of the specification described below, being constructed at any location within the proposed land acquisition boundary.

The proposed road has been designed as a Type 1 Single Carriageway Cross section with a carriageway width of seven metres (2 no. 3.65 metres lanes) and associated, hard shoulders, road verges and drainage ditches. The paved width is generally 12.3 metres with local widening to accommodate specific road features such as junctions, etc. The total width of the road including verges and associated features will be approximately 19 – 20 metres as a minimum where it is at grade with the local topography. However, over much of the route, the local topography is such that significant cut and fill will inevitably be required. This will extend the width of the road footprint considerably in some sections.

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|---|---|---|---|
| MAP TITLE: **Location of Proposed N5** | | MAP NO.: **Figure 1.1** | SCALE: **1:110,000** |
| PROJECT TITLE: **N5 Ballaghadereen to Scramoge Road Project** | | OS SHEET NO.: **-** | DATE: **20-06-2016** |
| DRAWING BY: **Pat Roberts** | CHECKED BY: **Pat Roberts** | ISSUE NO.: **140619-2016.06.20-D1** | |

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The principal elements of or associated with the proposed road development include the following:

- Approximately 33.4 Kilometres of National Primary Road to Type 1 Single Carriageway standard;
- Approximately 15.4km of realignment of existing roads;
- Five roundabouts;
    - Frenchpark Roundabout (R361 south of Frenchpark);
    - N61 Roundabout (between Tulsk and Elphin);
    - Shankill Roundabout (N61/R369);
    - Strokestown Roundabout (LP-1405);
    - Kildalloge Roundabout (R368/LP-1405);
- At grade mainline T junctions;
    - 26 'T' Junctions, of which 5 are staggered and 6 are ghost island;
- 3 road under bridges and 1 overbridge;
- 4 River bridges and 14 culverts;
- Approximately 190m of retaining walls at a number of locations;
- Provision of 8 accommodation underpasses, access roads and accesses;
- Associated earthworks including excavation of peat & unacceptable material, excavation of rock and disposal & recovery of unacceptable material;
- Temporary site compounds;
- Drainage works;
- Landscaping works;
- Utilities and Services Diversion Works including the diversion of high voltage electricity lines at 3 locations and the provision of associated support towers/ poles.
- Safety Barrier, Fencing and Accommodation Works;
- Environmental measures and all other Ancillary Works.

Much of the Proposed N5 is located in a Karst limestone area and as such there are relatively few watercourses with only six major watercourses identified along with drainage ditches that were small in size and appeared to be highly modified from any natural origin and form only a part of a land drainage network. Any proposed road will cross these watercourses and the potential for impacts when crossing or working in close proximity has been taken into account in this Screening Report.

There are also a number of lakes, wetland areas and karst features within the zone of influence of the proposed road development and whilst the proposed road development will avoid or result in minimal impacts on these areas, the potential for resultant impacts has been considered. The potential for hydrological linkage with lakes and turloughs via karstic features has also been considered.

Drainage measures associated with a road of this type are likely to include both open and closed drains, infiltration ditches, swales, attenuation ponds and soakaways.

# 3. IDENTIFICATION OF RELEVANT EUROPEAN SITES

## 3.1 Background to European Sites

### 3.1.1 European Sites

The EU Habitats Directive (92/43/EEC) provides the EU legislative framework of protecting rare and endangered species of flora and fauna, and habitats. This legislation requires the establishment and conservation of a network of sites of particular conservation value that are to be termed 'European Sites'.

There are three principal types of European site, a Special Area of Conservation (SAC), a Special Protection Area (SPA) and Sites of Community Importance. The candidate forms of each of these are also included and are afforded the same legislative protection as defined under SI 473/2011. These sites form part of "Natura 2000" a network of protected areas throughout the European Union. Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites under Irish domestic legislation being the Wildlife (Amendment) Act 2000. These sites do not form part of the Natura 2000 network however.

#### Special Areas of Conservation

The EU Habitats Directive (92/43/EEC), as amended, provides the EU legislative framework of protecting rare and endangered species of flora and fauna, and habitats. Annex I of the Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. Marsh Fritillary, Atlantic Salmon, and Killarney Fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as Lesser Horseshoe Bat and Otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish Hare, Common Frog and Pine Marten.

Species can be listed in more than one Annex, as is the case with Otter and Lesser Horseshoe Bat which are listed on both Annex II and Annex IV.

#### Special Protection Areas

Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (Birds Directive) has been substantially amended several times and was codified in 2009. It is now cited as Directive 2009/147/EC. The Directive requires Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3).

A subset of bird species has been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

## 3.2 European Sites in the Zone of Impact of the Proposed N5

Using the GIS software, MapInfo (Version 10.0), European sites within the zone of impact[1] of the project were identified. The following rationale was used to identify the Zone of impact. Initially, sites within a 15km radius of the proposed road development were identified (as per the DoEHLG Guidance (2010)). In addition, using the precautionary principle, European Sites located outside the 15km buffer zone were also taken into account and assessed where potential pathways for impact were identified and particularly where hydrological connectivity could be established. In this case, no potential for impacts on coastal or estuarine waters was identified.

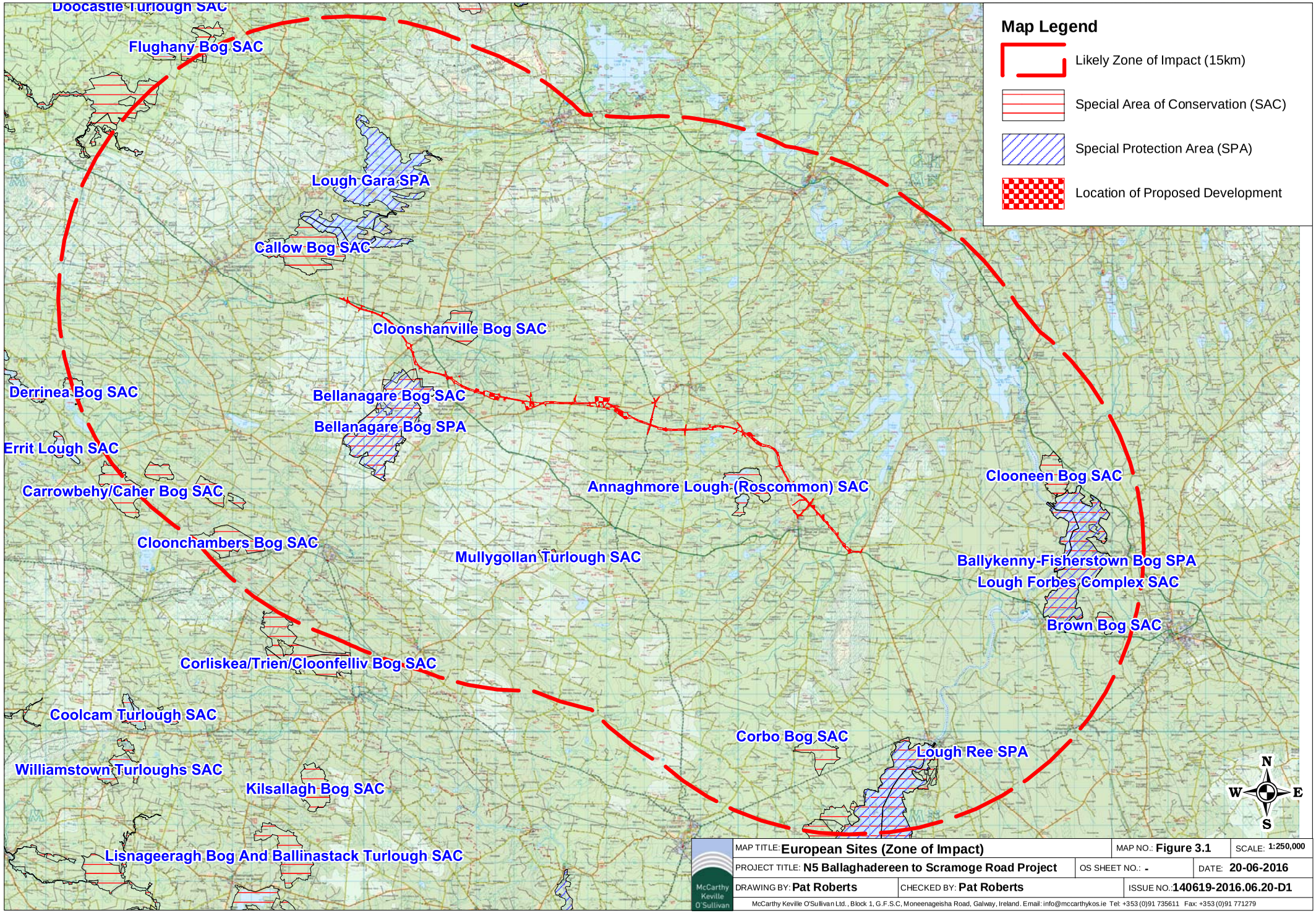
All European sites located greater than 15km from the proposed road development, with no identifiable connectivity (e.g. Lough Arrow SPA (004050) or located in a separate hydrological catchment i.e. Ballysadare (Water Framework Directive Catchment Mapping (WWW.watermaps.wfdireland.ie)) were deemed to be outside the Zone of impact of the proposed development as no pathways for significant effects were identified.

Additional European sites with hydrological connectivity, located downstream in the Shannon Catchment (i.e. River Shannon Callows SAC, Lough Derg North East Shore SAC, Lower River Shannon SAC, Middle Shannon Callows SPA, Lough Derg SPA) are considered to be sufficiently remote from the proposed road development as not to be impacted either by construction activities or operation of the proposed road development. The worst case scenario would be a major pollution incident towards the eastern end of the proposed road development which would have to travel a distance in excess of 70km discharging through Kilglass Lough, Lough Boderg, Lough Bofin, Lough Forbes and Lough Ree prior to reaching any of these European Sites. The buffering and dilution effect of these loughs will ensure imperceptible impact on European sites with identifiably hydrological connectivity but located outside the 15km buffer zone. These sites have subsequently not been included in Table 3.1 European Sites within the Zone of Impact of the proposed road development.

Figure 3.1 shows the location of the proposed road development in relation to all European sites within the Zone of Impact as identified according to the criteria described above.

Table 3.1 below, lists all European Sites that were considered to be within the Zone of Impact. The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were considered at the time of preparation of this report (13/06/2016). Details of these sites, including their distance from the proposed alignment, are provided in Table 3.1.

[1] Zone of likely impact is a term used in DoEHLG (2010). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Revision, February, 2010. Department of the Environment, Heritage and Local Government. Zone of Influence is used in NRA documentation and Guidelines

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| MAP TITLE: **European Sites (Zone of Impact)** | | MAP NO.: **Figure 3.1** | SCALE: **1:250,000** |
| PROJECT TITLE: **N5 Ballaghadereen to Scramoge Road Project** | | OS SHEET NO.: **-** | DATE: **20-06-2016** |
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**Table 3.1 European Sites within the Zone of Impact of the Proposed Road Development**

| European Site (Site Code) | Distance from Proposed Road Development (km) | Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 13/06/2016) | Conservation Objectives |
|---|---|---|---|
| **Special Areas of Conservation (SAC)** | | | |
| Bellanagare Bog SAC (000592) | 0.2km | • Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150] | Detailed Conservation Objectives are provided on the NPWS website for this site. |
| Annaghmore Lough (Roscommon) SAC (001626) | 0.9km | • Alkaline fens [7230]<br>• *Vetigo geyeri* (Geyer's Whorl Snail) [1013] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected* |
| Callow Bog SAC (000595) | 1.6km | • Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150] | Detailed Conservation Objectives are provided on the NPWS website for this site. |
| Cloonshanville Bog SAC (000614) | 1.7km | • Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150]<br>• Bog woodland [91D0] | Detailed Conservation Objectives are provided on the NPWS website for this site. |
| Tullaghanrock Bog SAC (002354) | 3.9km | • Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150] | Detailed Conservation Objectives are provided on the NPWS website for this site. |

| European Site (Site Code) | Distance from Proposed Road Development (km) | Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 13/06/2016) | Conservation Objectives |
|---|---|---|---|
| Mullygollan Turlough SAC (000612) | 7.8km | • Turloughs [3180] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected* |
| Corbo Bog SAC (002349) | 9.8km | • Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150] | Detailed Conservation Objectives are provided on the NPWS website for this site. |
| Lough Forbes Complex SAC (001818) | 10.0km | • Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]<br>• Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150]<br>• Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected* |

| European Site (Site Code) | Distance from Proposed Road Development (km) | Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 13/06/2016) | Conservation Objectives |
|---|---|---|---|
| Lough Ree SAC (000440) | 10.2km | • Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]<br>• Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Alkaline fens [7230]<br>• Limestone pavements [8240]<br>• Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]<br>• Bog woodland [91D0]<br>• *Lutra lutra* (Otter) [1355] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected* |
| Clooneen Bog SAC (002348) | 10.3km | • Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150]<br>• Bog woodland [91D0] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected* |
| Drumalough Bog SAC (002338) | 11.6km | • Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected* |

| European Site (Site Code) | Distance from Proposed Road Development (km) | Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 13/06/2016) | Conservation Objectives |
|---|---|---|---|
| Cloonchambers Bog SAC (000600) | 12.3km | • Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150] | Detailed Conservation Objectives are provided on the NPWS website for this site. |
| Brown Bog SAC (002346) | 12.9km | • Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected* |
| River Moy SAC (002298) | 13.1km | • Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the Rhynchosporion [7150]<br>• Alkaline fens [7230]<br>• Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]<br>• Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]<br>• *Austropotamobius pallipes* (White-clawed Crayfish) [1092]<br>• *Petromyzon marinus* (Sea Lamprey) [1095]<br>• *Lampetra planeri* (Brook Lamprey) [1096]<br>• *Salmo salar* (Salmon) [1106]<br>• *Lutra lutra* (Otter) [1355] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected* |

| European Site (Site Code) | Distance from Proposed Road Development (km) | Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 13/06/2016) | Conservation Objectives |
|---|---|---|---|
| Derrinea Bog SAC (000604) | 14.4km | • *Active raised bogs [7110]*<br>• *Degraded raised bogs still capable of natural regeneration [7120]*<br>• *Depressions on peat substrates of the Rhynchosporion [7150]* | Detailed Conservation Objectives are provided on the NPWS website for this site. |
| Flughany Bog SAC (000497) | 14.5km | • *Active raised bogs [7110]*<br>• *Degraded raised bogs still capable of natural regeneration [7120]*<br>• *Depressions on peat substrates of the Rhynchosporion [7150]* | Detailed Conservation Objectives are provided on the NPWS website for this site. |
| Corrowbehy/Caher Bog SAC (000597) | 14.5km | • *Active raised bogs [7110]*<br>• *Degraded raised bogs still capable of natural regeneration [7120]*<br>• *Depressions on peat substrates of the Rhynchosporion [7150]* | Detailed Conservation Objectives are provided on the NPWS website for this site. |
| **Special Protected Areas (SPA)** | | | |
| Bellanagare Bog SPA (004105) | 0.5km | • Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA* |
| Lough Gara SPA (004048) | 2.4km | • *Whooper* Swan (*Cygnus cygnus*) [A038]<br>• Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA* |

| European Site (Site Code) | Distance from Proposed Road Development (km) | Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 13/06/2016) | Conservation Objectives |
|---|---|---|---|
| Ballykenny-Fisherstown Bog SPA (004101) | 10.0km | • *Greenland* White-fronted Goose (*Anser albifrons flavirostris*) [A395] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA* |
| Lough Ree SPA (004064) | 10.3km | • *Little* Grebe (*Tachybaptus ruficollis*) [A004]<br>• *Whooper* Swan (*Cygnus cygnus*) [A038]<br>• *Wigeon* (*Anas penelope*) [A050]<br>• *Teal* (*Anas crecca*) [A052]<br>• *Mallard* (*Anas platyrhynchos*) [A053]<br>• *Shoveler* (*Anas clypeata*) [A056]<br>• *Tufted* Duck (*Aythya fuligula*) [A061]<br>• *Common* Scoter (*Melanitta nigra*) [A065]<br>• Goldeneye (*Bucephala clangula*) [A067]<br>• *Coot* (*Fulica atra*) [A125]<br>• *Golden* Plover (*Pluvialis apricaria*) [A140]<br>• *Lapwing* (*Vanellus vanellus*) [A142]<br>• *Common* Tern (*Sterna hirundo*) [A193]<br>• *Wetland* and Waterbirds [A999] | The generic conservation objective of this designated site is:<br>*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA*<br>A second objective of the site is:<br>*To maintain or restore the favourable conservation condition of the wetland habitat as a resource for the regularly-occurring migratory waterbirds that utilise it* |

# 4. ASSESSMENT OF LIKELY EFFECTS ON EUROPEAN SITES

## 4.1 Article 6(3) Assessment Criteria

The Screening Assessment criteria examined in the impact assessment section of this screening document follows the suggested screening matrix structure detailed in *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* (EC 2001).

**Screening of Special Protection Areas**

In relation to screening of Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites the Scottish Natural Heritage (SNH) Guidance, July 2013, *Assessing Connectivity with Special Protection Areas (SPA)* was consulted. This document provides guidance in relation to the identification of connectivity between proposed alignment proposals and Special Protection Areas. The guidance takes into consideration the distances some species may travel beyond the boundary of their SPAs and outlines information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.

### 4.1.1 Description of the Individual Elements of the Project with Potential to give Rise to Impacts on European Sites

This section of the report sets out the main work elements that could have the potential for significant impact on European sites.

- **Site Clearance and Earthworks**

  Site clearance works will require vegetation removal, top soil stripping and construction of temporary access routes for construction plant. In some instances there may also be a requirement for removal of significant amounts of earth material where site preparation and/or construction will require cut. Such activities, in the absence of mitigation, have the potential to give rise to indirect impacts on European sites via pollution of the aquatic environment. There is no potential for direct impacts on European sites.

- **Earthworks and Road Drainage**

  The movement of material resulting from earth works e.g. topsoil, peat and rock material has the potential to alter drainage patterns and result in surface run-off. In the absence of mitigation the runoff could potentially contain an increased loading of silt and pollutants such as hydrocarbons or concrete. The operational stage of the road development may result in surface water run-off entering water courses. Such water can contain high levels of silt, salts, heavy metals and hydrocarbons. In addition there is the possibility for pollution events resulting from collisions, leaks and other unforeseen events. Potential pathways for indirect impacts on European sites have been identified via pollution of the aquatic environment. There is no potential for direct impacts on European sites.

- **Stream Channel Diversion/Realignment**

  Impacts on water quality may also occur as a result of in-stream works including realignment of stream channels. Potential pathways for indirect impacts on European sites have been identified via pollution of the aquatic environment. There is no potential for direct impacts on European sites.

- **River Bridges and Culverts**

  River bridges and culverts are features of the proposed road development. The construction of structures can interfere with the morphology of the watercourses and in the absence of mitigation could give rise to pollution of the aquatic environment. During the operational phase the presence of bridges and culverts could potentially deplete light availability and could impact on fisheries/ faunal passage. Potential pathways for indirect impacts on European sites have been identified via pollution of the aquatic environment. There is no potential for direct impacts on European sites.

- **Temporary Construction Facilities/Installations**

  The construction and operation of site compounds and storage areas will be a feature of the construction stage of this road project. The removal of vegetation, earthworks, plant and fuel storage drainage and movement of plant will be a feature of this phase. Such activities, in the absence of mitigation, have the potential to give rise to indirect impacts on European sites via pollution of the aquatic environment.

### 4.1.2 Description of any Likely Direct, Indirect or Secondary Impacts of the Project on the European Sites

Any likely direct, indirect or secondary impacts of the proposed road development, both alone and in combination with other plans or projects, on European Sites by virtue of the following criteria: size and scale, land-take, distance from the European Site or key features of the site, resource requirements (such as water abstraction), emissions (disposal to land, water or air), excavation requirements, transportation requirements and duration of construction, operation, decommissioning are presented in Table 4.1 below.

**Table 4.1 Likely Impacts of the Proposed Road Development on the European Sites**

| Likely Direct, Indirect Cumulative and/or Secondary Impacts of the Project on the European Sites | |
|---|---|
| Size and Scale | Given the size and scale of the proposed road development and the nature of the construction activities associated with such a development, a number of sites within the identified Zone of Impact cannot be discounted at this stage in the assessment process. Taking a precautionary approach and based on identified connectivity, proximity and the nature of the Qualifying Interests (QIs) and Special Conservation Interests (SCIs) it cannot be excluded, in view of best scientific knowledge and on the basis of objective information that the proposed road development, individually or in combination with other plans and projects, would not have a significant effect on the following European Sites<br>• Cloonshanville Bog SAC (000614)<br>• Bellanagare Bog SAC (000592)<br>• Bellanagare Bog SPA (004105) (004105)<br>• Annaghmore Lough (Roscommon) SAC (001626))<br>• Lough Gara SPA (004048)<br>• Lough Forbes Complex SAC (001818)<br>In view of best scientific knowledge and on the basis of objective information, Significant effects from the proposed road development, whether individually or in combination with other plans or projects can be excluded beyond reasonable scientific doubt and thus the proposed road development is not likely to have significant effects on the following European Sites:<br>• Ballykenny-Fisherstown Bog SPA (004101)<br>• Brown Bog SAC (002346)<br>• Callow Bog SAC (000595)<br>• Cloonchambers Bog SAC (000600)<br>• Clooneen Bog SAC (002348)<br>• Corbo Bog SAC (002349)<br>• Corrowbehy/Caher Bog SAC (000597)<br>• Derrinea Bog SAC (000604)<br>• Drumalough Bog SAC (002338)<br>• Flughany Bog SAC (000497)<br>• Lough Ree SAC (000440)<br>• Lough Ree SPA (004064)<br>• Moygollan Turlough SAC (000612)<br>• River Moy SAC (002298)<br>• Tullaghanrock Bog SAC (002354) |
| Land-take | There will be no land take associated with the proposed road development within any European Site. However, the proposed road development has the potential to result in the loss of supporting habitat of species that are among the QIs/SCIs of European Sites, where these species occur outside the designated site within the Zone of Impact.<br>Potential habitat for the Greenland White Fronted Goose may occur within the proposed road development land acquisition boundary in the vicinity of Bellanagare Bog SPA (004105) and therefore impacts associated with habitat loss outside the SPA cannot be discounted at this stage in the assessment process. |

| Likely Direct, Indirect Cumulative and/or Secondary Impacts of the Project on the European Sites | |
|---|---|
| Land-take contd. | It is further possible that Greenland White Fronted Geese from the flock associated with Lough Gara SPA (004048) may potentially use lands within the proposed road development footprint and therefore, potential impacts on this site cannot be discounted at this stage in the assessment process.<br>No potential for impacts in regard to land take was identified in relation to any of the other European Sites within the Zone of Impact. |
| Distance from the European Sites or Key Features of the Site | The works are located a minimum distance of 0.2km from the nearest European Site and will not directly impact on any European Site as a result of proximity.<br>In the case of the following sites however, the potential for the proposed road development to result in impacts on the QIs in the form of hydrological changes resulting from road drainage/pollution could not be discounted at this stage of the assessment process. Therefore, it cannot be excluded, in view of best scientific knowledge and on the basis of objective information that the proposed road development, individually or in combination with other plans and projects, would not have a significant effect on the following European Sites:<br>• Annaghmore Lough (Roscommon) SAC (001626)<br>• Bellanagare Bog SAC<br>• Cloonshanville Bog SAC (000614)<br>• Lough Forbes Complex SAC (001818)<br>In addition to the potential hydrological impacts as discussed above, impacts due to disturbance to SCIs within/outside the designated sites, listed below, as a result of proximity could not be discounted at this stage of the assessment process. Therefore, it cannot be excluded, in view of best scientific knowledge and on the basis of objective information that the proposed road development, individually or in combination with other plans and projects, would not have a significant effect on the following European Sites:<br>• Bellanagare Bog SPA (004105)<br>• Lough Gara SPA<br>No potential for impacts in regard of distance from the proposed road development was identified in relation to any of the other European Sites (listed in Table 3.1) within the Zone of Impact. |
| Resource Requirements | There will be no exploitation of any resources within any European Site as part of the proposed road development and therefore impacts in this regard on any of the sites within the Zone of Impact (listed in Table 3.1) can be discounted. |
| Emissions | Emissions from the construction and operation of a road within the proposed road development footprint have the potential to include:<br>• Emissions to surface and ground water such as silt laden run off, hydrocarbons or other pollutants during both construction and operational phases.<br>• Emissions to air.<br>• Noise emissions<br>With regard to emissions to water, all European sites that were linked via surface watercourses downstream of the proposed road development were considered in the screening assessment. In addition, any sites which are potentially connected by groundwater were also considered.<br>It cannot be excluded, in view of best scientific knowledge and on the basis of objective information that the proposed road development, individually or in combination with other plans and projects, would not have a significant effect on the following European Sites:<br>• Annaghmore Lough (Roscommon) SAC (001626) has potential to be affected by emissions to surface and groundwater. |

| Likely Direct, Indirect Cumulative and/or Secondary Impacts of the Project on the European Sites | |
|---|---|
| Emissions contd. | • Lough Gara SPA (004048) has the potential to be affected by emissions to surface water and groundwater.<br>• Lough Forbes Complex SAC (001818) has the potential to be affected by emissions to surface water and groundwater.<br>• Cloonshanville Bog SAC (000614) has the potential to be affected by emissions to surface water and groundwater.<br>In view of best scientific knowledge and on the basis of objective information, the proposed road development, either individually or in combination with other plans or projects, is not likely to have significant effects on the on any additional European Sites as a result of any emission to water because they are either in another hydrological catchment and therefore not hydrologically connected or located sufficiently downstream such that the ambient dilution and attenuation by the catchment would result in imperceptible concentrations and changes in the flow regime at such receptors.<br>With regard to emissions to air, given the size and scale of the development and its distance from any European Site (over 0.2km and outside air quality assessment zone), in view of best scientific knowledge and on the basis of objective information, the proposed road development, either individually or in combination with other plans or projects, is not likely to have significant effects on any European Sites as a result of emissions to Air. |
| Excavation Requirements | There will be no works undertaken within any European Site and therefore no direct impacts relating to excavation are predicted. Potential indirect impacts include hydrological changes and emissions to surface water and groundwater. These potential impacts are considered above in relation to distance from European Sites and Emissions. |
| Transportation Requirements | As the proposed road development is located entirely outside any European Site, there will be no direct impacts on European sites associated with the transportation requirement.<br>All transportation will be conducted within the existing public road network or within the land acquisition boundary for the proposed road development. No potential pathway for direct impacts on any European Site as a result of the transportation requirements associated with this proposed road development was identified. However, potential pathways for indirect impacts in the form of emissions to air and water associated with the transportation requirement were identified and are discussed above in relation to emissions. |
| Duration of Construction, Operation, Decommissioning | As per the SNH Guidelines, potential for disturbance to the SCIs of the Bellanagare Bog SPA (004105) and Lough Gara SPA (004048) was identified on the basis of proximity. Therefore, it cannot be excluded, in view of best scientific knowledge and on the basis of objective information that the proposed road development, individually or in combination with other plans and projects, would not have a significant effect on the these European Sites. |

### 4.1.3 Cumulative Impacts

A search in relation to plans and projects that may have the potential to result in cumulative impacts on European sites was carried out. Data sources included the following:

- Roscommon County Council Website (Planning and roads sections)
- An Bord Pleanála Website (Planning Searches)
- Web search of Windfarm projects in Co. Roscommon
- Web Search for major infrastructure projects in Co. Roscommon
- Roscommon County Development Plan 2014 – 2020

- Coillte Roscommon Website

An overview of the search results is provided in Table 4.2. In additional to the plans and projects listed in Table 4.2 a number of small scale developments i.e. dwelling houses/extension were identified from the wider area surrounding the proposed road development.
Where potential pathways for impact on European Sites were identified in section 4.1.2, it cannot be excluded, in view of best scientific knowledge and on the basis of objective information that the proposed road development, individually or in combination with other plans and projects, would not have a significant effect on the following identified European Sites.

- Cloonshanville Bog SAC (000614)
- Bellanagare Bog SAC (000592)
- Bellanagare Bog SPA (004105)
- Annaghmore Lough (Roscommon) SAC (001626))
- Lough Gara SPA (004048)
- Lough Forbes Complex SAC (001818)

No potential pathways for impact were identified in relation to any additional European Sites, therefore it can be excluded, in view of best scientific knowledge and on the basis of objective information that the proposed road development, individually or in combination with other plans and projects, would not have a significant effect on additional European Sites.

**Table 4.2 Other Plans and Projects**

| Plans and Projects | Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Influence | Potential Impact on European Sites |
|---|---|---|
| | **Land Use and Spatial Plans** | |
| **Roscommon County Development Plan 2014-2020** | **Policy for Designated Sites**<br>**Policy 7.1** Protect proposed and designated Natural Heritage Areas, Special Protection Areas and Special Areas of Conservation. **Policy 7.2** Protect geological Natural Heritage Areas as they become proposed, designated and notified to Roscommon County Council during the lifetime of this plan.<br>**Policy 7.3** Protect any additional areas that may be proposed or designated during the lifetime of the plan in accordance with Policy above<br>**Policy 7. 4** Promote development in these areas, for recreational and educational purposes, where it would not conflict with the preservation and protection of these sites.<br>**Policy 7.5** It is Council policy to implement the mitigation measures a s set out in Section 11.3 of the Environmental Report accompanying the Development Plan, which are envisaged to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the County Development Plan. These mitigation measures refer to biodiversity, human health, geology and soils, water quality, flooding, air, climatic factors, transport infrastructure, wastewater treatment, waste management, cultural assets and landscape as referred to in Table 48 of the Environmental report<br>**Objectives for Designated Sites**<br>**Objective 7.1** Maintain or restore the favourable conservation condition of a designated or proposed designated site under the control of the Planning Authority.<br>**Objective 7.2** Ensure Appropriate Assessment Screening, and, where required, Appropriate Assessment, is carried out for any plan or project which, individually, or in combination with other plans and projects is likely to have a significant direct or indirect impact on any Natura 2000 site or sites; in accordance with best practice guidance as issued by the National Parks & Wildlife Service of the Department of Arts, Heritage & the Gaeltacht and/or the Department of Environment, Community & Local Government.<br>**Objectives for Nature Conservation**<br>**Objective 7. 5** Protect and promote the conservation of biodiversity outside of designated areas, while allowing for appropriate development, access and re creational activity.<br>**Objective 7.6** Continue to carry out habitat mapping for the count y to identify significant local habitats in the county. Mapping of habitats should prioritise: Habitats listed in Annex 2 of the EU Habitats Directive; Species listed in Annex 2 of the EU Habitats Directive; and Species listed in Annex 1 of the Birds Directive. | **Potential Positive Impact** |

| Plans and Projects | Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Influence | Potential Impact on European Sites |
|---|---|---|
| **Roscommon County Development Plan 2014-2020 (contd)** | **Objective 7.7** Co - operate with statutory and other relevant agencies to identify, protect and conserve a representative sample of the county's wildlife habitats of local or regional importance, not otherwise protected by legislation.<br>**Objective 7. 8** Identify, protect and conserve, in co - operation with the relevant statutory authorities and other groups, vulnerable, rare and threatened species or wild flora and fauna and their habitats. These include plant and animal species afforded protection under the Wildlife Acts and the EU Habitats & Birds Directives.<br>**Objective 7.9** Retain where feasible and enhance important landscape features, such as lakes, rivers, wetlands, stonewalls, hedgerows etc, which form wildlife corridors and link habitats, where they provide, stepping stones necessary for wildlife to flourish.<br>**Objective 7.10** Integrate biodiversity considerations into all Roscommon County Council activities<br>**Objective 7.11** Ensure that the conservation and management of biodiversity is a key priority in water resource management.<br>**Objective 7.12** Require that floodlighting proposals for historic structures are accompanied by a Bat Survey, carried out at the appropriate time of year by a suitably qualified person, so as to identify bat species present on the site and to specify mitigation measures required to ensure minimal disturbance to bats, if any, on the site.<br>**Objective 7.13** Seek to minimize light intrusion by having regard to impacts of floodlighting and public lighting in public/open spaces in or close to designated areas.<br>**Objective 7.14** Have regard to the recommendations of any national guidelines, which may come about during the lifetime of this plan, with respect to potential impacts on nature conservation, when considering development applications relating to activities; such as use of jet-ski's and power boats on sites of nature conservation importance.<br>**Objective 7.15** Ensure that any development, which impacts on a townland boundary, roadside hedgerows or hedgerows which form links with other habitats and form wildlife corridors; should first seek to retain, translocate or replace with native species of local provenance, these hedges. The overall goal should be to have no net loss of the hedgerow resource.<br>**Objective 7.16** The retention, re - location, or re - establishment of hedgerow s in planning consents shall be an aim of the Planning Authority for those seeking Planning Permission where feasible.<br>**Objective 7.17** Carry out a tree survey of the county to identify trees suitable for Tree Preservation Orders.<br>**Objective 7. 18** Commit to using native species where ever possible in its landscaping work and on Roscommon County Council property | |

| Plans and Projects | Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Influence | Potential Impact on European Sites |
|---|---|---|
| **Roscommon County Development Plan 2014-2020 (contd)** | **Objective 7.19** Assess applications for quarrying activity in proximity to eskers, having regard to the designated status of the esker and conserve them from inappropriate development.<br>**Objective 7.20** Seek hydrological reports for significant developments within and close to peatlands so as to assess impacts on the integrity of peatland ecosystems.<br>**Objective 7.21** Support projects which plan for future re - use of industrial cutaway bogs as sites for habitat creation, amenity use and economic use.<br>**Objective 7.22** Seek hydrological reports for significant developments within and close to turloughs so as to assess impacts on the integrity of the turlough system and associated groundwater levels.<br>**Objective 7.23** Support the work of the National Wetlands Wilderness Park committee.<br>**Objective 7.24** Promote awareness and educational opportunities relating to wetlands in the county<br>**Objective 7.25** Ensure that the County's wetlands are retained for their biodiversity and flood protection values.<br>**Objective 7.26** Ensure that where flood alleviation works take place the natural heritage and landscape character of rivers, streams and watercourses are protected and enhanced to the greatest extent possible.<br>**Objective 7.27** Encourage sensitive development, which does not lea d to a loss of, or cause damage to, the character, the principal components of, or the setting of parks, gardens and demesnes of special historic interest and which are protected.<br>**Objective 7.28** In order to facilitate development, a condition of planning permission may include seed or cutting collection from rare plants surviving in a heritage garden or park, in order to facilitate survival of a rare species.<br>**Objective 7.29** To co - operate with the Department of Arts, Heritage & the Gaeltacht and other interested groups to facilitate the protection, pro motion and enhancement of heritage gardens and parks in the county.<br>**Objectives for Alien Invasive Species**<br>**Objective 7.33** Support initiatives, which reduce the risk s of invasions, help control and manage new and established invasive species, monitor impacts, raise public awareness, improve legislation and address international obligations.<br>**Objective 7.34** Implement conditions as appropriate, as part of a g rant of a planning permission or a waste permit, to prevent spread of invasive species.<br>**Objective 7.35** Encourage the use of native species in amenity plan ting and stocking and related community actions to reduce the introduction and spread of non-native species.<br>**Objective 7.36** Investigate the development of a local authority staff code of practice (COP) in relation to invasive species where resources permit. | |

| Plans and Projects | Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Influence | Potential Impact on European Sites |
|---|---|---|
| | **Conservation and Management Plans** | |
| **Shannon River Basin District Management Plan (2009-2015)** | The Shannon International RBD Management Plan sets out a number of objectives and measures for all water bodies in the western catchment. The following is applicable in relation to European Sites:<br>**Core Objectives**<br>• prevent deterioration;<br>• restore good status;<br>• reduce chemical pollution;<br>• achieve water related protected areas objectives<br>• Chapter 5 of the Plan outlines the programme of measures for the RBD. | **Potential Positive Impact** |
| | **Fisheries Plans** | |
| **Inland Fisheries Ireland (IFI) Corporate Plan 2011-2015** | **Goals:**<br>• To improve the protection and conservation of the resource.<br>• To develop and improve wild fish populations.<br>• To increase the number of anglers.<br>• To generate a better return for Ireland from the resource | **Potential Positive Impact** |
| | **Forestry Plans** | |
| **Coillte**<br>**Mid West BAU 4 Strategic Plans 2016-2020** | **Objectives**<br>(i) Adopt an organisation wide system for managing environmental issues. The Director of Stewardship and Public Goods has responsibility for managing the implementation of this policy and our environmental management system (EMS).<br>(ii) Manage our business in full compliance with all applicable laws, directives and regulations, as well as voluntary external accredited schemes to which we subscribe e.g. the Forest Stewardship Council ® 2 (FSC ® ) and the Programme for the Endorsement of Forest Certification (PEFC™).<br>(iii) Prevent negative environmental impacts through a system of operational controls that include communication, written instructions and appropriate training<br>(iv) Continually improving environmental performance by setting and reviewing objectives & targets related to significant environmental risks and putting into effect programmes to reduce those risks.<br>(v) Communicate, as appropriate, our Environmental Policy to Coillte staff and stakeholders, contractors and their employees and the communities within which we operate. | **Potential Positive Impact** |

| Plans and Projects | Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Influence | | Potential Impact on European Sites |
|---|---|---|---|
| | **Waste Licensing & Permitting (Environmental Protection Agency)** | | |
| **Active Waste Licence Details (Source www.epa.ie 06/04/2016)** | **Reg No**. | W0059-03 | **No potential for significant cumulative impact** |
| | **Applicant Name:** | Roscommon County Council | |
| | **Facility Name:** | Ballaghaderreen Landfill | |
| | **Location of Facility:** | Aghalustia Townland, Ballaghaderreen, Co. Roscommon, | |
| | **Type of Facility:** | Landfill | |
| | **Main Class of Activity:** | 3.5 | |
| | **Other Classes of Activity (more )** | 3.1,3.4,3.13, | |
| | **Application Date:** | 18/06/2009 | |
| | **Licence Status**: | Licensed | |
| | **Latest licence for this facility:** | Reg No. W0059-03 | |
| | **Reg No.** | W0073-01 | |
| | **Applicant Name:** | Roscommon County Council | |
| | **Facility Name:** | Roscommon Landfill Facility | |
| | **Location of Facility:** | Killarney Townland, Roscommon, Roscommon. | |
| | **Type of Facility:** | Landfill | |
| | **Main Class of Activity:** | 3.1 | |
| | **Other Classes of Activity (more )** | 3.4,3.6,3.7,3.11,3.12,3.13,4.2,4.3,4.4,4.13, | |
| | **Application Date:** | 30/09/1998 | |
| | **Licence Status:** | Licensed | |
| | **Latest licence for this facility:** | Reg No. W0073-01 | |

| Plans and Projects | Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Influence | Potential Impact on European Sites |
|---|---|---|
| **Active Waste Licence Details (Source www.epa.ie 06/04/2016) (contd.)** | **Reg No.** W0163-01<br>**Applicant Name**: Bruscar Bhearna Teoranta<br>**Facility Name:** Bruscar Bhearna Teoranta (Ballaghaderreen)<br>**Location of Facility:** Ballaghaderreen Industrial Estate, Ballaghadereen, Co Roscommon<br>**Type of Facility:** Waste Transfer Station<br>**Main Class of Activity:** 3.11<br>**Other Classes of Activity (more )** 3.12,3.13,4.2,4.3,4.4,4.11,4.13,<br>**Application Date:** 5/09/2001<br>**Licence Status:** Licensed<br>**Latest licence for this facility:** Reg No. W0163-01 | |
| | **Projects Identified within 10km of the Proposed Road Development** | |
| **Proposed Projects** | The search identified three large-scale developments within 10 kilometres of the proposed route alignment:<br>• Slieve Bawn Wind Farm (Pl Ref: 10/507 Granted), 20 turbines, located 4 kilometres south of the proposed road development<br>• Runnaboll Wind Turbine (Pl Ref: 13/36 Granted) single turbine; located 7 kilometres north of the proposed road development.<br>• N61 Ratallen & Treanagry Road Improvement 7.3 kilometres north of the propose road development. | **No potential for significant cumulative impacts** |
| **Completed projects** | The search identified a number of completed developments within 10 kilometres of the proposed route alignment:<br>• N5 Ballaghaderreen Bypass Road Project, This scheme comprised 13.6km of standard single carriageway and provided a bypass to the north of Ballaghaderreen town. The project included realignment/bridging of local roads and a major grade separated junction between the N5 and R293 to provide access to the town. An Bord Pleanála approved the scheme in 2008. Works commenced on November 2, 2012, and the road opened on September 2, 2014.<br>• N5 Scramoge to Cloonmore Road Project. This scheme comprised an 8.3km stretch of standard single carriageway between Strokestown and Longford.<br>• Road Pavement Overlays/resurfacing works on the N5 during the 2000s.<br>• N5 Longford Bypass, which involved construction of 2.6 km of single carriageway and 6 structures. The project was completed in August 2012. | **No potential for significant cumulative impacts** |

### 4.1.4 Description of any Likely Changes to European Sites

Whilst no direct changes to European sites are considered likely as a result of the proposed road development, various pathways for potential impacts were identified during the Screening process and the potential for changes could not be entirely excluded at this stage in the assessment. Any potential changes to the European Sites are described below in Table 4.3 with reference to the following criteria: reduction of habitat area, disturbance to key species, habitat or species fragmentation, reduction in species density, changes in key indicators of conservation value (e.g. water quality etc.) and climate change.

**Table 4.3 Potential Changes to European Sites**

| Potential Changes to the European Sites | |
|---|---|
| Reduction of Habitat Area | There will be no reduction in habitat area within any European Sites as a result of the proposed road development. Potential for reduction in habitat area outside the European Sites but affecting populations of QI's/SCI's that may be associated with the sites was identified in the following cases:<br>Potential habitat for the Greenland White Fronted Goose may occur within the proposed land acquisition in the vicinity of Bellanagare Bog SPA (004105) and therefore impacts associated with habitat loss outside the SPA cannot be discounted at this stage in the assessment process.<br>It is further possible that the Greenland White Fronted Goose from the flock associate with Lough Gara SPA (004048) may potentially use lands within the land acquisition boundary and therefore, potential impacts on this site cannot be discounted. |
| Disturbance to Key Species | As per the SNH Guidelines, potential for disturbance to the SCIs of the Bellanagare Bog SPA (004105) and Lough Gara SPA (004048) was identified on the basis of proximity. |
| Habitat or Species Fragmentation | There will be no habitat or species fragmentation within any European Site associated with the proposed road development. As mentioned above, there is the potential for populations of key species from within the European Sites to be impacted in areas that are outside the European Sites. Potential for such impacts were identified in the case of Bellanagare Bog SPA (004105), and Lough Gara SPA (004048) |
| Reduction in Species Density | Where pathways for impacts on European Sites have been identified in the preceding sections, the potential for reduction in species density on these identified European Sites cannot be excluded at this stage in the assessment process. |
| Changes in Key Indicators of Conservation Value | Where pathways for impacts on European Sites have been identified in the preceding sections, the potential for changes in key indicators of conservation value at these identified European Sites cannot be excluded at this stage in the assessment process. In the case of Bellanagare Bog SAC (000592) and Cloonshanville Bog SAC (000614) the potential for hydrological changes leading to the deterioration of Peatland habitats cannot be excluded at this stage of the development. In the case of Annaghmore Lough (Roscommon) SAC (001626) the potential for hydrological changes or groundwater pollution resulting in the deterioration of Alkaline Fen and supporting habitat of *Vertigo geyeri* cannot be excluded at this stage of the development. In relation to Lough Forbes Complex SAC (001818) the potential for hydrological changes or groundwater pollution to aquatic habitats among the QI's of the site cannot be excluded at this stage of the development. |

| Potential Changes to the European Sites | |
|---|---|
| Changes in Key Indicators of Conservation Value contd. | Similarly, in the case of Lough Gara SPA (004048) the potential for surface water pollution to impact negatively on the supporting habitat for the bird species that are among the SCI's cannot be excluded at this stage of the appropriate assessment process It should be noted that the preservation of wetlands is not a Conservation objective of Lough Gara SPA . |
| Climate Change | Given the nature and scale of the works, climate change as a result of the proposed road development is not anticipated. |

### 4.1.5 Description of any Potential Impacts on any European Site

The proposed road development will avoid any direct impacts on any European sites. However, the potential for impacts and effects on some European Sites as identified in the preceding sections cannot be entirely excluded at this stage in the development and therefore an Appropriate Assessment is required.

No Direct Impacts on European Sites will occur as a result of the proposed road development. Indirect Impacts on European Sites are not considered likely but potential for such impacts has been identified as described above and can therefore not be excluded. Table 4.4 describes the nature of any indirect impacts in terms of the structure and function of the identified European Sites.

**Table 4.4 Assessment of Potential Impacts on the Structure and Function of European Sites**

| Likely Changes to the European Sites | |
|---|---|
| Interference with the key relationships that define the structure of a European Site | Potential impacts as identified in the preceding sections which could result in interference with the Structure of a European Site include:<br>• Potential changes to the hydrological regime, which may result in the deterioration of habitat within the identified European sites.<br>• Potential surface water and groundwater pollution, which may result in the deterioration of habitat within the identified European sites. |
| Interference with key relationships that define the function of the European site | Potential impacts as identified in the preceding sections which could result in interference with the Function of a European Site include:<br>• Potential for reduction in habitat area outside the European Sites but affecting populations of QI's/SCI's that may be associated with the sites<br>• Potential disturbance related impacts |

### 4.1.6 Indicators of Significance as a Result of the Identification of Effects

Indicators of significance are provided in Table 4.5 below for any impacts identified above in terms of loss, fragmentation, disruption, disturbance and changes to key elements of the European Sites, such as water quality.

**Table 4.5 Indicators of Significance as a Result of the Identification of Effects**

| Indicators of Significance as a Result of the Identification of Effects | |
|---|---|
| Loss | There will be no loss of habitats within European sites as a result of the proposed road development. Potential for reduction in habitat area outside the European Sites but affecting populations of QI's/SCI's that may be associated with the identified sites cannot be discounted at this stage in the assessment process and would be measured in terms of loss of utilised or suitable supporting habitat. |

| Indicators of Significance as a Result of the Identification of Effects | |
|---|---|
| Fragmentation | There will be no fragmentation of habitats and species, within European sites, as a result of the proposed road development. Potential for habitat fragmentation outside the European Sites but affecting populations of QI's/SCI's that may be associated with the identified sites cannot be discounted at this stage in the assessment process in terms of fragmentation of utilised or suitable supporting habitat. |
| Disruption | Disruption to the ecological processes within the European Sites where pathways for impact were identified above cannot be discounted at this stage of the development and would be measured in terms of changes to the baseline environment. |
| Disturbance | The potential for disturbance to bird species within the Bellanagare Bog SPA (004105) cannot be discounted at this stage in the assessment process and would be measured in terms of changes to the baseline usage of the site.<br>As per the SNH Guidelines, potential for disturbance to the SCIs of the Bellanagare Bog SPA (004105) and Lough Gara SPA (004048) was identified should the SCI species occur outside the boundaries of the SPAs. |
| Changes to Key Elements of the Site | The potential for changes to key elements of the European Sites where pathways for impact were identified above cannot be discounted at this stage of the development and would be measures in terms of changes to the baseline environment. |

# 5. ARTICLE 6(3) SCREENING STATEMENT AND CONCLUSIONS

## 5.1 The findings of this Screening Report are presented in the following sections

## 5.2 Description of Project

**Proposed N5 Ballaghaderreen – Scramoge, Road Project**

The proposed road development is described in detail in Section Two of this report and synopsised below. The proposed road development is approx. 33.4km long. It commences at the tie-in with the recently completed N5 Ballaghaderreen Bypass and re-joins the existing N5 at Scramoge to the east of Strokestown.

## 5.3 Potential for Effects on European Sites

### 5.3.1 Sites that are 'Screened In'

Where the potential for impacts on any particular European Site cannot be excluded at this stage of the assessment a summary of such potential impacts is provided in Table 5.1. The potential for impacts is based on the findings of the assessment that is provided in Section Four of this report.

Where, in view of best scientific knowledge and on the basis of objective information it cannot be excluded that the proposed road development, individually or in combination with other plans and projects, will have a significant effect on any European Sites that were assessed as part of the screening exercise as described above, they are considered to be 'Screened In'. As a result, an Appropriate Assessment of the proposed road development is required with regard to these European Sites and a Natura Impact Statement shall be prepared.

Those European Sites for which likely significant effects could not be excluded are presented in Table 5.1 below. The site synopses of the Screened-In European Sites are provided as Appendix II.

**Table 5.1 European Sites that have been 'Screened In'**

| European Site (Site Code) | Distance from Proposed Road Development (km) | Screening Summary |
|---|---|---|
| **Special Areas of Conservation (SAC)** | | |
| Bellanagare Bog SAC (000592) | 0.2km | There will be no direct impacts as the proposed road development is located entirely outside the designated site. Potential pathways for indirect impacts on the Qualifying Interests were identified in the form of potential hydrological changes resulting from road drainage. Thus the potential for significant effects on this European Site cannot be excluded at this stage of the Appropriate Assessment process and it is 'Screened In'. |
| Annaghmore Lough (Roscommon) SAC (001626) (001626) | 0.9km | There will be no direct impacts as the proposed road development is located entirely outside the designated site. Potential pathways for indirect impacts on the Qualifying Interests were identified in the form of potential hydrological changes and potential surface and groundwater pollution resulting from road construction and operation, thus the potential for significant effects on this European Site cannot be excluded at this stage of the Appropriate Assessment process and it is 'Screened In'. |
| Cloonshanville Bog SAC (000614) (000614) | 1.7km | There will be no direct impacts as the proposed road development is located entirely outside the designated site. Potential pathways for indirect impacts on the Qualifying Interests were identified in the form of emissions to surface and ground waters and hydrological changes resulting from road drainage, thus the potential for significant effects on this European Site cannot be excluded at this stage of the Appropriate Assessment process and it is 'Screened In'. |
| Lough Forbes Complex SAC (001818) | 10.0km, 30km hydrologically | This site is located downstream of the proposed road development and fed by the River Shannon. The site is possibly just within the Zone of Impact of the project in respect to an unmitigated potential serious surface water spillage towards the eastern end of the proposed road development, thus the potential for significant effects on this European Site cannot be excluded at this stage of the Appropriate Assessment process and it is 'Screened In'. |
| **Special Protected Areas (SPA)** | | |
| Bellanagare Bog SPA (004105) (004105) | 0.5km | Due to the proximity of this European Site to the proposed road development, potential impacts resulting from disturbance are considered further. In addition, there is the potential for loss of habitats, outside the European site, which may support the Greenland White Fronted Goose. There is also the potential for population fragmentation. The potential for significant effects on this European Site cannot be excluded at this stage of the Appropriate Assessment process and it is 'Screened In'. |

| European Site (Site Code) | Distance from Proposed Road Development (km) | Screening Summary |
|---|---|---|
| Lough Gara SPA (004048) (004048**)** | 2.4km | The core winter foraging range of Whooper Swan is <5km and the core range of Greenland White Fronted Goose is 5-8km (SNH,2013). There is potential for indirect impacts to bird populations for which the SPA was designated where these populations occur outside the SPA. There is hydrological connectivity between the proposed road development and the SPA the potential for hydrological change/pollution of the SPA must be considered on a precautionary basis. In addition, there is the potential for habitat loss and fragmentation outside the SPA but potentially impacting on SCI populations associated with the SPA, thus the potential for significant effects on this European Site cannot be excluded at this stage of the Appropriate Assessment process and it is 'Screened In'. |

### 5.3.2 Sites that are 'Screened Out'

Where it is concluded that, in view of best scientific knowledge and on the basis of objective information, the proposed road development either individually or in combination with other plans or projects, is not likely to have significant effects on the European Sites that were assessed as part of the screening exercise as described above, are considered to be 'Screened Out'. The sites that have been 'Screened Out' are shown in Table 5.2.

As a result, an Appropriate Assessment of the proposed road development is not required with regard to these European Sites.

**Table 5.2 European Sites that have been 'Screened Out'**

| European Site (Site Code) | Distance from Proposed Road Development (km) | Screening Summary |
|---|---|---|
| **Special Areas of Conservation (SAC)** | | |
| Callow Bog SAC (000595) (000595) | 1.6km | There will be no direct impacts as the proposed road development is located entirely outside the designated site. Hydrologically it is not linked to the proposed road development as the Bog Complex is located immediately to the south of Lough Gara and the water regime governing this bog complex will not be affected by emissions or drainage effects from the road construction and operation. No complete impact source-pathway-receptor chain was identified during the Screening Assessment as provided in Section Four of this report. Significant Impacts on the European Site resulting from the proposed road development can be excluded and it is 'Screened Out'. |
| Tullaghanrock Bog SAC (002354) | 2.9km | No complete impact source-pathway-receptor chain was identified during the Screening Assessment as provided in Section Four of this report. Significant Impacts on the European Site resulting from the proposed road development can be excluded and it is 'Screened Out'. |
| Moygollan Turlough SAC (000612) | 7.8km | There is no hydrological or hydrogeological connectivity between the Moygollan Turlough and the proposed road development as they are not within the same surface water catchment or groundwater body.<br>No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded and it is 'Screened Out'. |

| European Site (Site Code) | Distance from Proposed Road Development (km) | Screening Summary |
|---|---|---|
| Corbo Bog SAC (002349) | 9.8km | There is no hydrological or hydrogeological linkage as the Bog Complex is located a minimum of 50km hydrologically downstream of the proposed road development adjacent to Lough Ree and the water regime governing this bog complex will not be affected by emissions or drainage effects from the Road construction and operation.<br>No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |
| Lough Ree SAC (000440) | 10.2km | The Lough Ree SAC (and by inference Natura 2000 water bodies downstream of Lough Ree) is considered to be sufficiently remote from the proposed road development as not to be impacted either by construction activities or operation of the proposed road development. The worst case scenario would be a major pollution incident towards the eastern end of the project which would have to travel a distance in excess of 50km discharging through Kilglass Lough, Lough Boderg, Lough Bofin and Lough Forbes. The buffering and dilution effect of these loughs will ensure imperceptible impact within the Lough Ree system.<br>No complete impact source-pathway-receptor chain for significant impact was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |
| Clooneen Bog SAC (002348) | 10.3km | There is no hydrological or hydrogeological linkage as the Bog Complex is located well downstream of the proposed road development, immediately to north of Lough Forbes and the water regime governing this bog complex will not be affected by emissions or drainage effects from the road construction and operation.<br>No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |
| Drumalough Bog SAC (002338) | 11.6km | There is no hydrological or hydrogeological linkage as the Bog Complex is located within a different drainage catchment (Suck Catchment) and groundwater body.<br>No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |

| European Site (Site Code) | Distance from Proposed Road Development (km) | Screening Summary |
|---|---|---|
| Cloonchambers Bog SAC (000600) | 12.3km | There is no hydrological or hydrogeological linkage as the Bog Complex is located within a different drainage catchment (Suck Catchment) and groundwater body.<br>No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |
| Brown Bog SAC (002346) | 12.9km | There is no hydrological or hydrogeological linkage as the Bog Complex is located in excess of 25km downstream of the proposed road development and the water regime governing this bog complex will not be affected by emissions or drainage effects from the Road construction and operation.<br>No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |
| River Moy SAC (002298) | 13.1km | There is no hydrological or hydrogeological linkage as the River Moy SAC is within a different hydrometric area (Moy Catchment). No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |
| Derrinea Bog SAC (000604) | 14.4km | This bog complex is within the Shannon System (Lung catchment that discharges through Lough Gara) and is located c. 14.5km up-gradient of the western end of the road and therefore the proposed road development will not hydrologically impact this bog complex.<br>No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |
| Flughany Bog SAC (000497) | 14.5km | There is no hydrological or hydrogeological linkage as the Bog Complex is located within a different catchment (Moy Catchment) and groundwater body.<br>No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |
| Corrowbehy/Caher Bog SAC (000597) | 14.5km | There is no hydrological or hydrogeological linkage as the Bog Complex is located within a different catchment (Suck Catchment) and groundwater body.<br>No complete impact source-pathway-receptor chain was identified during the Screening Assessment. Significant Impacts on the European Site resulting from the proposed road development can be excluded at this stage of the development and it is 'Screened Out'. |

| European Site (Site Code) | Distance from Proposed Road Development (km) | Screening Summary |
|---|---|---|
| **Special Protected Areas (SPA)** | | |
| Ballykenny-Fisherstown Bog SPA (004101) | 10.0km | There is no hydrological or hydrogeological linkage as the Bog Complex is located in excess of 25km downstream of the proposed road development to the west of Lough Forbes and the water regime governing this bog complex will not be affected by emissions or drainage effects from the road construction and operation.<br>Given the distance between the European Site and the proposed works and the nature and core foraging range (SNH 2014) of the Special Conservation Interests, no complete impact source-pathway-receptor chain could be identified. Potential impacts are not anticipated. |
| Lough Ree SPA (004064) | 10.3km | The Lough Ree SPA (and by inference Natura 2000 water bodies downstream of Lough Ree) is considered to be sufficiently remote from the proposed road development as not to be impacted either by construction activities or operation of the road. The worst case scenario would be a major pollution incident towards the eastern end of the project which would have to travel a distance in excess of 50km discharging through Kilglass Lough, Lough Boderg, Lough Bofin and Lough Forbes. The buffering and dilution effect of these loughs will ensure imperceptible impact within the Lough Ree system.<br>As per the SNH Guidelines (2013), the proposed road development is located outside the core foraging range of the species listed as SCIs of Lough Ree SPA. Given the distance between the European Site and the proposed works and the nature of the SCIs no complete source-pathway-receptor chain for significant impacts could be identified. Potential impacts are not anticipated. |

## 5.4 Data Collected to Carry Out Assessment

In preparation of the assessment, the following sources were used to gather information:

- Review of NPWS published information on European Sites including Site Synopses, European Site mapping and Conservation Objectives for European Sites
- Field surveys including habitat mapping, mammal and bird surveys completed throughout 2014, 2015 & 2016, details of which are provided in Flora and Fauna Chapter within the EIS.
- Desk study, field studies and associated reporting prepared by John Hynes and reviewed by Pat Roberts, McCarthy Keville O'Sullivan Ltd throughout 2014, 2015 & 2016.

## 5.5 Overall Conclusions

In view of best scientific knowledge and on the basis of objective information, it is concluded that the proposed road development, whether individually or in combination with other plans or projects, beyond reasonable scientific doubt will not have significant effects on the following European Sites referred to in List 1:

**List 1 European Sites**

- Callow Bog SAC (000595)
- Ballykenny-Fisherstown Bog SPA (004101)
- Brown Bog SAC (002346)
- Cloonchambers Bog SAC (000600)
- Clooneen Bog SAC (002348)
- Corbo Bog SAC (002349)
- Corrowbehy/Caher Bog SAC (000597)
- Derrinea Bog SAC (000604)
- Drumalough Bog SAC (002338)
- Flughany Bog SAC (000497)
- Lough Ree SAC (000440)
- Lough Ree SPA (004064)
- Moygollan Turlough SAC (000612)
- River Moy SAC (002298)
- Tullaghanrock Bog SAC (002354)

It cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge and on the basis of objective information that the proposed road development, individually or in combination with other plans and projects, would have a significant effect on the following European Sites referred to in List 2.

**List 2 European Sites**

- Annaghmore Lough (Roscommon) SAC (001626)
- Bellanagare Bog SAC (000592)
- Bellanagare Bog SPA (004105) (004105)
- Cloonshanville Bog SAC (000614)

- Lough Forbes Complex SAC (001818)
- Lough Gara SPA (004048)

As a result an appropriate assessment of the proposed road development is required and a Natura Impact Statement should be prepared in respect of the proposed development.

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# APPENDIX I
# Assessing Connectivity with SPAs, Scottish Natural Heritage, 2013

Scottish Natural Heritage
All of nature for all of Scotland

# Guidance

## Assessing Connectivity with Special Protection Areas (SPAs)

**July 2013**

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### Purpose of Guidance

The purpose of this guidance is to help identify 'connectivity' between development proposals and Special Protection Areas (SPAs). The Natura assessment process asks "Is the proposal likely to have a significant effect on the site?" This step acts as a screening stage, removing from the Habitats Regulations Appraisal plans/projects which clearly have no connectivity to a site's qualifying interests or those where it is very obvious that the conservation objectives for the site's qualifying interests will not be undermined despite a connection.

To assess whether there are processes or pathways by which the proposal may influence the site's qualifying interests, it is important to consider the distances that some species may travel beyond the boundary of their SPAs. This guidance provides information on dispersal and foraging distances for a range of bird species which are frequently encountered when considering plans and projects.

This guidance should not be used as a basis for setting bird survey requirements; these are set out in 'Survey methods for use in assessing the impacts of onshore wind farms on bird communities'.

This document provides an update to guidance previously published in 2012.

### Typical Connectivity Distances

The connectivity distances of each species set out in Table 1 are drawn from a literature review that examined ranging behaviour. In most cases **the core range should be used** when determining whether there is connectivity between the proposal and the qualifying interests. Maximum ranges are also provided to indicate that birds will, at times, travel further. In exceptional cases distances up to the maximum foraging range may be considered; for example, whilst osprey core foraging range is 10km an osprey foraging at a loch well beyond this distance from its SPA may still be connected if there is a lack of other closer foraging sites. SNH should be consulted where there is any doubt over the applicability of the core range.

Some species for which there are currently no SPAs in Scotland, but regularly feature in non-Natura casework, are also included.

*Table 1 – Summary of foraging distance during breeding season*

| **Species** | **Foraging range from nest site during breeding season** |
|---|---|
| Red-throated diver | Generally less than 8km, but regular flights of 11-13.5km recorded on Western Isles. |
| Black-throated diver | Likely to be less than 10km. |
| Red kite | Core range of 4km, with maximum range of up to 6km. |
| Hen harrier | Core range of 2km, with maximum range of 10km. |
| Goshawk | Core range of 3km, with maximum range generally less than 10km, and maximum recorded distance of 18km. |
| Golden eagle | Core range of 6km, with maximum range of up to 9km. |
| Osprey | Core range of 10km, with some regular foraging up to 20km, and maximum recorded distance of 28km. |
| Merlin | Within 5km. |
| Peregrine | Core range of 2km, with maximum recorded distance in Britain of 18km. |
| White-tailed eagle | Core range of 5km, with maximum range of 13km. |
| Short-eared owl | Core range of 2km, with maximum range of 5km. |
| Black grouse | Within 2km, with male core ranges of up to 1.5km and of female core ranges of approximately 0.5km. |
| Golden plover | Core range of 3km, with maximum range of 11km. |
| Greenshank | Core range of 2km, with maximum range of 3km. |
| Dunlin | Core range of 500m, with maximum range of 3km. |
| Curlew | Core range of 1km, with maximum range usually within 2km. |

*Table 2 – Summary of foraging distances during winter season*

| **Species** | **Foraging range from night roost during winter season** |
|---|---|
| Whooper swan | Core range of less than 5km. |
| Greylag goose | Core range of 15-20km* |
| Pink-footed goose | Core range of 15-20km* |
| Greenland white-fronted goose | Core range of 5-8km. |
| Barnacle goose | Core range of 15km, with maximum recorded distance of up to 25km. |

*The distribution of feeding pink-footed and Icelandic greylag geese in Scotland has been mapped in Mitchell (2012). These maps are another tool which enables the identification of areas where impacts from proposed developments on geese may be of concern and, conversely, areas which

despite being within 20km of a goose SPA have no connectivity with the qualifying interests.

*Table 3 – Summary of distances between alternative nest sites*

| **Species** | **Distance between alternative nest sites** |
|---|---|
| Red-throated diver | Distances of 1km are not unusual. |
| Black-throated diver | Likely to be similar to above: within 1km. |
| Red kite | Within 1km. |
| Hen harrier | Generally within 1km. |
| Goshawk | Generally 200-300m apart, but can move to new territories up to 2.5km away. |
| Golden eagle | Less than 3km apart in high-density areas; up to 6km apart elsewhere. |
| Osprey | Within 2km. |
| Merlin | Generally within 500m, but can be up to 1.5km. |
| Peregrine | Mean distance of 3km, and maximum distance of 6.5km. |
| White-tailed eagle | Generally within 3km, and a maximum distance of 12km. |
| Short-eared owl | No information. |
| Black grouse | Within 2km range. |
| Golden plover | No information. |
| Greenshank | No information. |
| Dunlin | No information. |
| Curlew | No information. |

**Sources of further information**

Should you require further detail than that provided in the tables above or you would like to see the evidence base for the distances please refer to the full literature review.

The tables will be updated periodically as new information is published.

*References*

Mitchell, C. 2012. *Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland.* Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge. 108pp.

# APPENDIX II
# NPWS Site Synopses

# SITE SYNOPSIS

## SITE NAME: LOUGH GARA SPA

## SITE CODE: 004048

Lough Gara is a shallow (maximum depth 16 m), medium-sized lake which overlies Carboniferous limestones and shales, and Devonian sandstone. The main inflowing river is the River Lung while the main outflow is the Boyle River. There are two main sections to the lake, a larger northern basin and a smaller southern basin, joined by a narrow channel. The lake is classified as a mesotrophic system, with reduced planktonic algal growth noted in a recent sampling period (1998-2000). The shoreline is convoluted and has receded substantially from its original level due to various drainage schemes since the mid-19th century. The site includes several low-lying islands.

The shallow lake margins have extensive swamps dominated by Common Reed (*Phragmites australis*) and Bottle Sedge (*Carex rostrata*), with occasional Bulrush (*Typha latifolia*). In the southernmost part of the lake, clumps of Common Club-rush (*Scirpus lacustris*) are particularly abundant. The old lakeshore is mostly clearly visible, below which a sedge-rich marsh occurs – this includes such species as Black Bog-rush (*Schoenus nigricans*), Devil's-bit Scabious (*Succisa pratensis*), Creeping Bent (*Agrostis stolonifera*) and Wild Angelica (*Angelica sylvestris*), with willows (*Salix* spp.) colonising some areas. The upper part of the shore is frequently colonised by scrub, which includes willows, Alder (*Alnus glutinosa*) and Hawthorn (*Crataegus monogyna*). Raised bog occurs outside of the site to its south and south-west.

Lough Gara is a regularly used site by an internationally important Greenland White-fronted Goose population (average flock size of 510 individuals over the five winters 1994/95 to 1998/990). The geese feed mainly on intensively-managed grasslands bordering the lake. When disturbed the geese use an island in the site or the lough itself. An important Whooper Swan population also uses the site (average mean peak of 382 for two of the winters in the 1995/96 to 1999/00 period), with numbers of international importance being present in the winter of 1996/97 (peak of 654). A range of other species occurs, though all in relatively low numbers; species present include Great Crested Grebe (32), Mute Swan (38), Wigeon (593), Teal (44), Mallard (157), Shoveler (18), Pochard (41), Tufted Duck (49), Goldeneye (20) and Golden Plover (270) - figures are average peaks for two of the winters in the period 1995/96-1999/00.

There are currently no activities taking place within the site which significantly affect the birds. Part of the site is a Wildfowl Sanctuary.

Lough Gara SPA is of high ornithological importance principally on account of the internationally important Greenland White-fronted Goose population that is associated with the lake and also the high numbers of Whooper Swan. The occurrence of these

# SITE SYNOPSIS

**Site Name: Annaghmore Lough (Roscommon) SAC**

**Site Code: 001626**

Annaghmore Lough is located 5 km north-west of Strokestown, Co. Roscommon. It lies at the centre of a network of small lakes in a rolling, drift-covered landscape. The shoreline slopes gently to the lake and these low-lying margins are extensively flooded in winter. In summer, when water levels recede, substantial areas of this shallow calcareous lake dry out, leaving flat expanses of exposed marl. A smaller, less calcareous lake occurs to the south of the site.

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):

| |
|---|
| [7230] Alkaline Fens |
| [1013] Geyer's Whorl Snail (*Vertigo geyeri*) |

The main lake at this site is surrounded by Common Club-rush (*Scirpus lacustris*) backed by reedbeds of Common Reed (*Phragmites australis*). Extensive areas of alkaline fen, dominated by Black Bog-rush (*Schoenus nigricans*) occur around the shoreline. Damp calcareous grassland, subject to winter flooding, also occurs in association with the fen. Common Butterwort (*Pinguicula vulgaris*) is extremely abundant in this species-rich grassland, together with Common Sedge (*Carex nigra*), Carnation Sedge (*C. panicea*), Glaucous Sedge (*C. flacca*), Tawny Sedge (*C. hostiana*), Greater Bird's-foot-trefoil (*Lotus uliginosus*) and Few-flowered Spike-rush (*Eleocharis quinqueflora*). Several orchid species are found, including Early Marsh-orchid (*Dactylorhiza incarnata*) and Fragrant Orchid (*Gymnadenia canopsea*). A number of uncommon plants are found in the wet calcareous fen and surrounding grasslands. These include Broad-leaved Cottongrass (*Eriophorum latifolum*), Marsh Helleborine (*Epipactis palustris*), Marsh Hawk's-beard (*Crepis paludosa*), Bee Orchid (*Ophrys apifera*) and Fly Orchid (*O. insectifera*). The fen also hosts two rare moss species, *Bryum neodamense* and *B. uliginosum*, although the latter has not been seen at the site for several years.

A small area of limestone pavement with abundant White Stonecrop (*Sedum album*) and an old cutover bog add diversity to the site.

Two populations of the rare whorl snail *Vertigo geyeri* are found in association with Black Bog-rush in the alkaline fen on the northern shore of Annaghmore Lough. This species is rare in Europe and listed on Annex II of the E.U. Habitats Directive.

The site is important for wintering birds and is listed as a wildfowl sanctuary, with nationally important numbers of Teal (545) and Shoveler (55) (counts are average peaks for period 1998/99 – 2002/03). A good diversity of other species occur in local or regional concentrations, including Wigeon (402), Mallard (183), Pochard (28), Goldeneye (22), Lapwing (297) and Curlew (84). Of particular note is the occurrence, albeit in small numbers, of two species which are listed on Annex I of the E.U. Birds Directive, Whooper Swan (7) and Golden Plover (264).

This site is relatively intact with only minor damage caused by cattle poaching and some burning on the fen. Some infilling of wetland vegetation has occurred between the northern shore of the lake and the nearby road. Drainage is a potential threat to the site and associated floodlands.

This is a site of considerable conservation importance as it contains a range of uncommon plant species, supports significant bird numbers, and contains a good example of alkaline fen vegetation. It is also particularly noteworthy because it supports a population of the rare snail *Vertigo geyeri*.

# SITE SYNOPSIS

**Site Name: Bellanagare Bog SAC**

**Site Code: 000592**

Bellanagare Bog is a large bog situated 6 km north-north-east of Castlerea in Co. Roscommon. It is classified as a western, or intermediate, raised bog, because is shows features of both raised bog and blanket bog. The bog is underlain by muddy Carboniferous limestone with a low permeability. The sub-soil is predominantly of clayey limestone till. The site lies in an upland area at the top of a surface catchment divide. The surface of the bog is undulating and the peat is concentrated on ridges, with flushes occurring in between. A number of streams, including the Frances River, rise on the site. The bog is traversed by several tracks. A large section of the site is in state ownership.

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):

| |
|---|
| [7110] Raised Bog (Active)* |
| [7120] Degraded Raised Bog |
| [7150] Rhynchosporion Vegetation |
| [1065] Marsh Fritillary (*Euphydryas aurinia*) |

Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species, Bog Asphodel (*Narthecium ossifragum*), sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*) and Carnation Sedge (*Carex panicea*).

The high bog at Bellanagare is predominantly comprised of degraded raised bog. This habitat tends to be drier that the active bog areas and species such as Cross-leaved Heath (*Erica tetralix*), Heather (*Calluna vulgaris*), Common Cottongrass (*Eriophorum angustifolium*), Bog Asphodel, Carnation Sedge and Deergrass tend to be the most frequent and conspicuous. Indicator species of midland raised bogs such as Bog-rosemary (*Andromeda polifolia*) and the bog moss *S. magellanicum* are present, though they are not as common as in raised bogs further east in the country. The

cover of bog mosses is relatively low in areas of degraded bog and there are few wet pool areas

Well-developed hummocks and several quaking areas occur in the active area of the high bog at this site. Rhynchosporion vegetation is best developed in the areas of active raised bog where there is deep and quaking peat. Such areas contain numerous pools and quaking flats which support a typical, species-poor vegetation that includes plant species such as *Sphagnum cuspidatum*, Bogbean (*Menyanthes trifoliata*), White Beak-sedge, Great Sundew (*Drosera anglica*) and Common Cottongrass. The rare moss *Sphagnum pulchrum* has been recorded from such areas recently, and Brown Beak-sedge, a relatively scarce species in Ireland, has also been recorded from wet pools. Bog-sedge (*Carex limosa*), a species more usually found on blanket bogs, occurs in some pools.

Bellanagare Bog is also notable for the range of flush types found. These occur quite frequently and are usually located in depressions. Flush types on the site include an in-filling lake, an extensive Purple Moor-grass (*Molinia caerulea*) flush with a high diversity of plant species, a large swallow-hole flush, and flushes associated with springs, rises and streams. One flush is coincident with a bog burst. The site also includes much cut-away bog, small areas of heath, scrub, wet grassland and several small conifer plantations.

The scarce butterfly, Marsh Fritillary, a species listed on Annex II of the E.U. Habitats Directive, is found at this site. This species has most commonly been recorded in areas where its food plant Devil's-bit Scabious (*Succisa pratensis*) occurs, such as in flushes, cutover bog and wet grassland.

The site provides habitat for a relatively large population of Red Grouse, a scarce and declining species in Ireland.

The site is vulnerable to water loss through the extensive drain network in its northern half, and from active peat- cutting which occurs in places all around the site. The site is also very vulnerable to burning because of it being quite a dry bog.

For a raised bog, Bellanagare Bog is floristically unusual, supporting species typically found on raised bogs as well as species more usually found on blanket bogs. Bellanagare Bog is of considerable scientific and conservation significance, in particular for its status as an intermediate raised bog, but also for the wide variety of flush types found, as well as for its large size and for the presence of scarce plant species. Raised bogs are rare and threatened in Europe, and are listed as a priority habitat on Annex I of the E.U. Habitats Directive.

# SITE SYNOPSIS

**Site Name: Cloonshanville Bog SAC**

**Site Code: 000614**

Cloonshanville Bog is located approximately 2 km east of Frenchpark in Co. Roscommon. The eastern boundary of the site is the Breedoge River, while the southern is the Frenchpark/Elphin road. The bog developed in a shallow basin in a groundwater discharge zone and is underlain by low-permeability, clayey limestones. The regional water table has been lowered, but evidence of groundwater inputs are seen on and around the high bog.

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):

| |
|---|
| [7110] Raised Bog (Active)* |
| [7120] Degraded Raised Bog |
| [7150] Rhynchosporion Vegetation |
| [91D0] Bog Woodland* |

Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species, Bog Asphodel (*Narthecium ossifragum*), sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*) and Carnation Sedge (*Carex panicea*).

At this site the majority of the uncut high bog is dominated by degraded raised bog. However, a significant area of active bog occurs in the central and northern part of the bog. In the wettest areas hummock/pool systems have developed and it is here that Rhynchosporion vegetation is best represented. The pools and/or quaking lawns are dominated by the bog moss *S. cuspidatum* and White Beak-sedge. Other species which have been noted from this area include Bogbean (*Menyanthes trifoliata*), Great Sundew (*Drosera anglica*), Common Cottongrass (*Eriophorum angustifolium*), Bog Asphodel and the bog mosses *S. papillosum* and *S. pulchrum*. Heather (*Calluna vulgaris*) is a common species of the hummocks, occurring with such species as Cross-leaved Heath (*Erica tetralix*), Cranberry (*Vaccinium oxycoccos*), Bog-rosemary

(*Andromeda polifolia*) and the bog mosses *S. fuscum* and *S. pulchrum*. The cover of lichens is generally good.

A large flush area occurs in the centre of the bog dome. The main body of the flush supports an extensive area of bog woodland, an extremely rare Irish woodland type. The woodland is well-developed structurally and contains a diverse range of plant species. It is dominated by birch (*Betula* sp.), with some willow (*Salix* sp.) occurring also, and with an understorey of tussocky Purple Moor-grass (*Molinia caerulea*). Bog-myrtle (*Myrica gale*) occurs in places.

Much of the degraded bog still retains a raised bog flora and the main species are Heather, Hare's-tail Cottongrass (*E. vaginatum*), Bog Asphodel and Deergrass, along with scarcer species such as Cranberry and Bog-rosemary. *Sphagnum* cover is variable, but is generally below 30% within these degraded areas. The nationally rare *Sphagnum pulchrum* is common throughout areas of degraded bog within the site.

There are three areas of conifer plantation on the peat along the margins of the site. These were planted within the past 25 years. In places the trees have not grown well, and in these areas there is still a significant understorey of typical raised bog plants. It is likely that bog vegetation would regenerate well in these areas following tree removal and the implementation of some restoration measures such as drain blocking.

The high bog is surrounded by cutover areas, some of which have been converted to improved grassland. The Breedoge River, which marks the eastern boundary of the site, adds habitat diversity and is of some importance for waterfowl, including Mallard and Snipe.

Much of the uncut high bog is in a degraded state as a result of drainage associated with peat cutting. Afforestation has also affected the integrity of the bog. Additionally, it is possible that dredging of the adjacent river may, indirectly, have had a deleterious effect on the hydrology of the habitat. Further drying out of the surface of the bog remains a threat.

Cloonshanville Bog is a site of high conservation importance as it contains good examples of the Annex I habitats bog woodland, active raised bog, degraded raised bog and Rhynchosporion depressions on peat substrates, with the first two habitats being listed with priority status. The area of bog woodland ranks as one of the most extensive and well-preserved examples of wet bog woodland in the country. The bog also supports a large population of the uncommon bog moss, *Sphagnum pulchrum*.

# SITE SYNOPSIS

**Site Name: Lough Forbes Complex SAC**

**Site Code: 001818**

This site consists of a number of different habitats, and is centred around Lough Forbes, a lake formed by a broadening of the River Shannon. As well as the lake itself, there is also a series of raised bogs, callow grasslands and a variety of other aquatic and terrestrial habitats to the west of Newtown Forbes on the Longford/Roscommon boundary.

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):

| |
|---|
| [3150] Natural Eutrophic Lakes |
| [7110] Raised Bog (Active)* |
| [7120] Degraded Raised Bog |
| [7150] Rhynchosporion Vegetation |
| [91E0] Alluvial Forests* |

Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species, Bog Asphodel (*Narthecium ossifragum*), sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*) and Carnation Sedge (*Carex panicea*).

The raised bogs, located on the south-eastern shore of Lough Forbes, are known as the Ballykenny-Fishertown complex. These bogs are of international importance as unique examples of Shannon River edge bogs and they are also the most northerly intact bogs adjacent to the River Shannon. The central core areas of the bogs are quite wet and spongy, with a good complement of bog mosses and well developed hummocks. Ballykenny Bog is unusual in that some of its margins are intact, a rare feature in the Irish midlands. Between the Camlin River and this bog, a complete transition from raised bog to callow grasslands can be seen, while the interface between the bog and lake is colonised by a narrow band of deciduous woodland.

In the wetter areas of the bog surface, Rhynchosporion vegetation is sometimes found. *Sphagnum cuspidatum* is frequent, along with Bogbean (*Menyanthes trifoliata*), White Beak-sedge and Common Cottongrass (*Eriophorum angustifolium*). The relatively rare Brown Beak-sedge has also been recorded. Degraded raised bog is largely confined to the marginal areas of uncut high bog where drainage effects from adjoining turbary are most pronounced. The plant species composition of degraded raised bog is generally similar to that of active raised bog, however species typical of very wet bog conditions are either much reduced in abundance or absent. In general, the most frequent vascular species are Deergrass, Common Cottongrass, Hare's-tail Cottongrass (*E. vaginatum*), Heather (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), Bog Asphodel and Carnation Sedge. The most frequent lower plant species present are the lichen *Cladonia portentosa* and the mosses *Hypnum cupressiforme* and *Sphagnum capillifolium*.

Lough Forbes is a medium sized lake underlain by limestone. It has extensive swamps of Common Reed (*Phragmites australis*) which provide good cover for wildfowl, although numbers have declined recently, possibly due to the increase in cruisers and other pleasure boats. Freshwater marshes are also a common feature along the lakeshore. These areas contain a good diversity of aquatic and emergent vegetation, comprised of species such as sedges (*Carex vesicaria, C. rostrata and C. acuta*), Bogbean, Common Spike-rush (*Eleocharis palustris*), Fine-leaved Water-dropwort (*Oenanthe aquatica*), Water Plantain (*Alisma plantago-aquatica*), Cowbane (*Cicuta virosa*), Common Club-rush (*Scirpus lacustris*) and Reed Canary-grass (*Phalaris arundinacea*).

The site contains extensive areas of woodland. The wet woodland types present include willow woodland, Ash-Alder woodland on slightly higher ground, Ash-oak woodland at the highest levels and birch woodlands on dried-out or cut-away bog. The principal woodland type, however, is a drier mixed oak-Ash woodland. The total area of woodland within the SAC is estimated at over 170 ha, of which at least 40 ha are alluvial woodland. Several individual woodlands exceed 40 ha and there is good continuity. There is little woodland on the Roscommon side of the lough. The majority of the woodland within the SAC is recorded as having been present in part or in full on the 1st edition Ordnance Survey maps from the 1840s. These may be considered therefore as potentially ancient or long-established woodlands, a conclusion reinforced by the presence of a number of relatively rare species and ancient woodland indicator species.

The dry Pedunculate Oak (*Quercus robur*) – Ash (*Fraxinus excelsior*) woodland is dominated by Pedunculate Oak and Ash, up to 20 m tall, with occasional Alder (*Alnus glutinosa*), Rowan (*Sorbus aucuparia*) and Yew (*Taxus baccata*), as well as a variety of exotic species, principally Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*) and lime (*Tilia* sp.). The shrub layer is variable in cover and species, with Hazel (*Corylus avellana*), Holly (*Ilex aquifolium*), Hawthorn (*Crataegus monogyna*), Spindle (*Eunoymus europaea*), willows (*Salix caprea* and *S. cinerea* subsp. *oleifolia*) and the relatively rare species Bird Cherry (*Prunus padus*), Buckthorn (*Rhamnus catharticus*) and Alder Buckthorn (*Frangula alnus*). The introduced and invasive

Cherry Laurel (*Prunus laurocerasus*) and Rhododendron (*Rhododendron ponticum*) are locally abundant. The herb layer consists of Bramble (*Rubus fruticosus* agg.), Enchanter's-nightshade (*Circaea lutetiana*), violet (*Viola* sp.), Bluebell (*Hyacinthoides non-scripta*) and several species of ferns, e.g. *Dryopteris filix-mas, D. affine, D. dilatata* and *Polystichum setiferum*.

Areas of birch woodland are dominated by birch, occasional Alder on more base-rich sites, Rowan, Holly and Scots Pine (*Pinus sylvestris*). Rhododendron forms thickets in some stands. The herb layer is relatively species-poor with Bramble, Purple Moor-grass (*Molinia caerulea*), Bracken (*Pteridium aquilinum*), Wood-sorrel (*Oxalis acetosella*) and abundant mosses, e.g. *Polytrichum* species.

Extensive areas of alluvial woodland fringe the shores of Lough Forbes and the Shannon, as well as extending along some of the tributaries. Three main types occur: willow woodlands, Alder-Ash woodlands and Ash-oak woodlands.

The willow woodland stands are generally found fringing the rivers and lake, and are usually quite narrow due to the hilly/boggy landscape which tends to rise steeply from the river. This results in a mostly narrow floodplain, but in places, lower lying ground may be flooded at times of high water levels. These woodlands are generally structurally complex stands of multi-stemmed Rusty Willow (*Salix cinerea* subsp. *oleifolia*), up to 8 m tall, where the roots are in permanently waterlogged, acidic to neutral, base-rich silty soils. Birch (*Betula* sp.) and Alder are occasional. A thin shrub layer of Hawthorn may be present in drier locations. Ivy (*Hedera helix*) and Bramble occur only in small amounts. The field layer consists of tall herbaceous species such as Reed Canary-grass, Yellow Loosestrife (*Lysimachia vulgaris*), Purple Loosestrife (*Lythrum salicaria*), Meadowsweet (*Filipendula ulmaria*), Marsh Ragwort (*Senecio aquaticus*), Yellow Iris (*Iris pseudacorus*) and Marsh-marigold (*Caltha palustris*). The moss layer is poorly developed with just a scattering of species such as *Rhizonmium punctatum* and *Mnium hornum*.

Alder-Ash woodland is the most extensive type of alluvial woodland at this site. This community occurs behind the willow woodland on slightly more elevated land that nonetheless is regularly flooded. The main canopy species are Alder and Ash, with occasional Pedunculate Oak, birch and Sycamore. Rusty Willow and Hawthorn are the principal shrub species, with a small amount of Guelder-rose (*Viburnum opulus*), Bird Cherry and Hazel. The herb flora is species-rich and is dominated by Meadowsweet, with Remote Sedge (*Carex remota*) and Golden Saxifrage (*Chrysosplenium oppositifolia*). Geophytes include Bluebell and Lesser Celandine (*Ranunculus ficaria*). Other characteristic species include Ivy, Enchanter's-nightshade, Reed Canary-grass, Yellow Iris, Cuckooflower (*Cardamine pratensis*), Yellow Loosestrife and Broad Buckler-fern (*Dryopteris dilatata*). Where grazing occurs, Creeping Bent (*Agrostis stoloniifera*) is abundant. The moss layer is mostly poorly developed, with *Thamnobryum alopecurum, Calliergonella cuspidata* and *Conocephalum conicum* being the most frequent species. The rare Elongated Sedge (*Carex elongata*) occurs locally.

Ash-Pedunculate Oak alluvial woodland occurs behind the Alder-Ash woodland where the land is subject to occasional flooding or where the water-table is high. Ash and Pedunculate Oak are the dominant canopy species, with occasional Sycamore, Beech and Horse-chestnut (*Aesculus hippocastanum*). The shrub layer is formed chiefly from Hazel, with Elder (*Sambucus nigra*), Hawthorn and occasional Bird Cherry, along with regenerating Ash and Sycamore. It is essentially a wetter version of the Oak-Ash woodland described above, but the field layer is characterised by moisture-loving species such as Golden Saxifrage, Remote Sedge, Wood-sedge (*Carex sylvatica*) and Bugle (*Ajuga reptans*). While the field layer is diverse and species-rich, the moss layer is only moderately developed, the most common species being *Thamnobryum alopecurum*, *Thuidium tamariscinum* and *Rhytidiadelpus triquetrus*.

Areas of callows (winter-flooded grassland) along the Camlin River are also included within this site. Like the internationally important Shannon Callows, these wet grasslands are included for their botanical interest as well as for the waterbirds that they support. Both Lough Forbes and the callow grasslands provide good habitat for a range of wintering waterfowl species though most occur in relatively low numbers. Counts in two of the winters in the 1995/96 to 1999/00 period are as follows: Cormorant (51), Whooper Swan (40), Wigeon (419), Teal (444), Shoveler (6), Tufted Duck (49) and Goldeneye (11). The bogs were formerly used by part of the Loughs Kilglass and Forbes Greenland White-fronted Goose wintering population, but these appear to have now been abandoned in favour of grassland sites elsewhere. Merlin has been recorded within the site and may nest. Whooper Swan and Merlin are listed on Annex I of the E.U. Birds Directive. Red Grouse are known from the bogs. Red Grouse is a Red Listed species in Ireland as it has declined in numbers in recent decades.

The raised bogs are vulnerable to water loss from peat-cutting and drainage, though ongoing restoration work involving blocking of drains is occurring. There are no known threats to the wintering birds though the increased use of the River Shannon system by leisure craft could cause disturbance.

The importance of the Lough Forbes site lies in its excellent diversity of habitats, some of which, for example the raised bogs, are rare and threatened. The site is also of ornithological importance for its wintering waterfowl, breeding Merlin and Red Grouse. The presence of Whooper Swan and Merlin is of particular note as these species are listed on Annex I of the E.U. Birds Directive.

species, along with Golden Plover, is of particular note as they are listed on Annex I of the E.U. Birds Directive.