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# Ballybofey-Stranorlar Flood Relief Scheme

Ground Investigation Contract 1 – Screening for Appropriate Assessment

**Donegal County Council**

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## Glossary of Terms and Abbreviations

%	Percent
AA	Appropriate Assessment
Birds and Natural Habitats Regulations	S.I. no. 477 of 2011 and subsequent amendments (2011-2021)
CFRAM	Catchment Flood Risk Assessment and Management Study
dB	Decibels
DCC	Donegal County Council
DHPLG	Department of Housing, Local Government and Heritage
DOENI	Department of the Environment (Northern Ireland)
EC	European Commission
EIA	Environmental impact assessment
EIAR	Environmental impact assessment report
EU Habitats Directive	Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.
FRS	Flood Relief Scheme
IUCN	International Union for Conservation of Nature
km	Kilometres
km <sup>2</sup>	Kilometres squared
m	Metres
m <sup>2</sup>	Metres squared
NBDC	National Biodiversity Data Centre
NPWS	National Parks and Wildlife Service
OPW	Office of Public Works
OSPAR	Oslo/Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
SAC	Special Area of Conservation
SCI	Special Conservation Interest
SI	Statutory Instrument
SPA	Special Protection Areas
SPL	Sound Pressure Level
Water Framework Directive	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.
Wildlife Acts	Wildlife Act (no. 39 of 1976) and subsequent amendments (1976-2021).

# 1 Introduction

## 1.1 Project Background

Ballybofey-Stranorlar Flood Relief Scheme (BSFRS) forms part of the overall works package for Donegal Bundle 2 along with Buncrana FRS and Ramelton FRS. The objective of the project is the identification, design and submission (for planning consent) of Flood Relief Schemes, that are technically, socially, environmentally and economically acceptable, to alleviate the risk of flooding to each community to a determined Standard of Protection; and to procure, manage and supervise the construction and handover of these Schemes.

Figure 1.1 shows the hydrological layout of Ballybofey-Stranorlar, its surroundings and the watercourses that are the subject of the flood relief scheme.



Figure 1.1. Watercourses

### 1.1.1 Potential Flood Risk Management Measures

A viable scheme option for Ballybofey-Stranorlar was identified in the CFRAM level of assessment and the preferred measures outlined in the CFRAM comprise (see Figure 1.2):

- Flood defences along River Finn at

- Cedars Housing Estate
  - Jackson's Hotel Carpark
  - Navenny
- Flood defences along Burn Daurnett at
  - Cappry
  - Navenny
- Flood defences along Goland at Goland
- Flood defences along Sessiagh at Sessiaghoneill
- Flood defences along Magherapaste at Drumboe Cottages
- Flood defences along Lough Alann at St Mary's National School
- Flood defences along Cooladawson at its crossing of the N15

Additional works/investigations identified post CFRAM that may include:

- Culvert improvements on Lough Alann watercourse in Stranorlar
- Investigations at the Glebe Housing estate in Stranorlar
- Investigations of Ballybofey embankments

A project-level options assessment will consider the scheme option outlined in the CFRAM and any other viable options arising out of project-level assessment. Development of the latter is ongoing and will be based on more detailed information than was available for the CFRAM, including detailed hydrological assessment, hydraulic modelling studies, geotechnical investigations and environmental studies. Consequently, the type and location of measures outlined in the CFRAM and shown in Figure 1.2 are liable to change as further information becomes available through project level assessment.

This screening for AA relates to the GI works only as described in Section 5.2 and Appendices A and B.



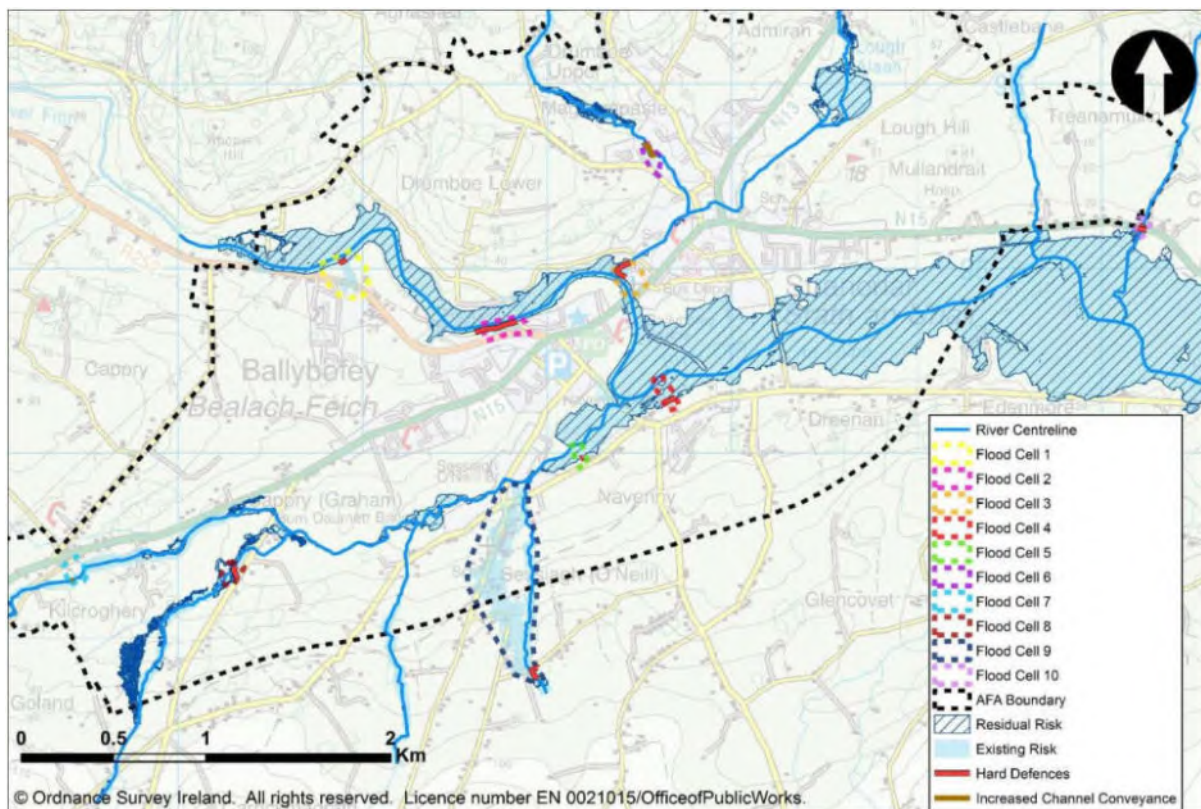


Figure 1.2. Proposed CFRAM Measures (source: RPS, 2013).

## 1.2 Purpose of Report

This report contains information in support of the Appropriate Assessment (AA) screening, undertaken by ByrneLooby on behalf of Donegal County Council (DCC), in respect of the ground investigation contract 1 works for a proposed flood relief scheme to alleviate the risk of flooding for Ballybofey-Stranorlar.

The ground investigation (GI) works consist of the following land-based activities:

1. Boreholes;
2. Trial pits; and
3. Dynamic probes.

Drawings showing the locations of the above are provided in Appendix A (Figures W3639-BLP-DWG-W-3100 to W3639-BLP-DWG-W-3104) and listed on the schedules in Appendix B. Further details on the proposed GI works are provided in Section 5 of this report.

This report has been prepared in accordance with the requirements of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477/2011), as amended.

Donegal County Council, in their role as the Competent Authority is obliged to examine whether the ground investigation works could have significant effects, individually or in combination, on European Sites, considering their specific qualifying interests and conservation objectives. If screening determines that there is likely to be significant effects on a European Site, or the effects are uncertain or unknown, then an Appropriate Assessment (AA) must be carried out for the works, including the compilation of a Natura Impact Statement to inform the decision making.

This report provides relevant material to inform a decision by the public authority, as required under Article 6.3 of the EU Habitats Directive, as to whether the preliminary site investigation works are likely to have any significant impacts on the Conservation Objectives of a Natura 2000 site. If it cannot be excluded on the basis of objective information that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European Site, then it is necessary to submit a Natura Impact Statement (NIS) so that the Competent Authority can carry out the Appropriate Assessment.

### 1.3 Guidance Documents on Appropriate Assessment

Where an AA is necessary, the AA requirements of Article 6(3) of the Habitats Directive 92/43/EEC (European Communities 2001) follow a sequential approach as outlined in the following guidance documents:

- Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities. Department of Environment, Heritage and Local Government, 2010 revision.
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 and PSSP 2/10.
- 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 (European Commission Environment Directorate-General, 2002).
- Managing Natura 2000 Sites: The provisions of Article 6 of the Habitat's Directive 92/43/EEC Commission Notice (European Commission Environment Directorate-General, 2018).
- Commission notice Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (2021/C 437/01).
- Guidelines for Good Practice Appropriate Assessment of Plans Under Article 6(3) Habitats Directive (International Workshop on Assessment of Plans under the Habitats Directive, 2011).
- The Department of the Environment, Heritage and Local Government guidance “*Appropriate Assessment of Plans and Projects in Ireland – guidance for Planning Authorities, 2009*” and the European Commission (2001) guidelines “*Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*”.

## **1.4 Preparation of this Report**

This report has been prepared by Steven Tooher (BSc MSc) and Fiona Symes (BSc MSc CEnv) with ByrneLooby, and Brendan O'Connor (BSc PhD MCIEEM) with Aquafact/APEM.

Brendan O'Connor is the ecology lead for the overall project and has responsibility for all ecological surveys and reporting. He is expert in ecological matters and the full spectrum of environmental assessment techniques, methodologies and statutes. Professionally, he is a member of relevant Institutes requiring the highest standards of professional competence and integrity. He is a member of the Institute of Ecology and Environmental Management and is Chairman of the Irish MAST Committee.

As Managing Director of AQUAFACCT Brendan has been responsible for all aspects of management including the design, execution and reporting of numerous desk studies, surveys, assessments and environmental outputs including NIS, AA screening and EIARs.

Steven Tooher has worked as an ecologist and environmental consultant with ByrneLooby since July 2015. He has managed the planning and implementation of a wide variety of ecological surveys and reports for various public and private clients around Ireland.

Fiona Symes has over 20 years' experience working in the ecological and environmental fields. She has planned and completed numerous ecological surveys, including habitat mapping and protected species surveys, across the UK and Ireland. She has authored many ecological reports, EcIAs and EIAs for a variety of projects over the duration of her career.

## 2 Legislative Background and Guidance Documents

### 2.1 International Legislation

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as the “Habitats Directive”, provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to have a significant effect on or to adversely affect the integrity of European Sites (Annex 1.1). Article 6(3) establishes the requirement for AA:

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

Article 6(4) states:

*“If, in spite of a negative assessment of the implications for the [European] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 sites is protected. It shall inform the Commission of the compensatory measures adopted.”*

#### 2.1.1 The requirement for AA Screening

Section 42 (1) of S.I. No. 477 of 2011, the European Communities (Birds and Natural Habitats) Regulations 2011 states:

*“A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.”*

Where the screening process cannot exclude the possibility that a plan or project, individually or in combination with other plans or projects, could have a significant effect on a European site, there

is a requirement under Article 42 (9) of these Regulations for the preparation of a Natura Impact Statement to inform the Appropriate Assessment process.

### 2.1.2 Screening Determination

In accordance with Regulation 42(7) of the Birds and Natural Habitats Regulations 2011 (S.I. No. 477/2011) as amended:

*“The public authority shall determine that an Appropriate Assessment of a plan or project is not required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it can be excluded on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site.”*

Further, under Regulation 42(8):

*“(a)Where, in relation to a plan or project for which an application for consent has been received, a public authority makes a determination that an Appropriate Assessment is required, the public authority shall give notice of the determination, including reasons for the determination of the public authority, to the following—*

- i. the applicant,*
- ii. if appropriate, any person who made submissions or observations in relation to the application to the public authority, or*
- iii. if appropriate, any party to an appeal or referral.*

*(b) Where a public authority has determined that an Appropriate Assessment is required in respect of a proposed development it may direct in the notice issued under subparagraph (a) that a Natura Impact Statement is required.”*

## 2.2 National Legislation

### 2.2.1 The European Communities (Birds and Natural Habitats Regulations 2011 (S. I. No. 477 of 2011))

The Habitats Directive has been transposed into Irish law by Part XAB of the Planning and Development Act, 2000 - 2015 and the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477/2011) as amended (see above).

### 2.2.2 The Planning and Development Act (2001-2021)

Schedule 2, Part 1 of the Planning and Development Regulations 2001 (as amended) lists developments that are exempt from the usual planning process. Class 45 includes: *“Any drilling or excavation for the purpose of surveying land or examining the depth and nature of the subsoil, other than drilling or excavation for the purposes of minerals prospecting”*. As such, the proposed SI is considered ‘exempted development’ under the Act.



## **3 Overview of Methodology for Appropriate Assessment**

### **3.1 Overview of the stages of Appropriate Assessment**

The AA process is a sequential process consisting of four potential stages. If at the first stage in the process it is determined that there will be no significant effect on a European Site, the process is effectively completed. The four stages are as follows:

- Stage 1 – Screening of the proposed plan or project for AA (current stage);
- Stage 2 – An AA of the proposed plan or project;
- Stage 3 – Assessment of alternative solutions; and
- Stage 4 – Imperative Reasons of Overriding Public Interest (IROPI)/ Derogation.

Stage 1 relates to Regulation 42 of the Birds and Natural Habitats Regulations; and Stage 2 relates to Article 6(3) of the Habitats Directive; and Stages 3 and 4 to Article 6(4) of the Habitats Directive.

#### **3.1.1 Stage 1: Screening (current stage)**

The aim of screening is to assess if the plan or project is directly connected with or necessary to the management of European Site(s); or in view of best scientific knowledge, if the plan or project, individually or in combination with other plans or projects, is likely to have a significant effect on a European site. This is done by examining the proposed plan or project and the conservation objectives of any European Sites that might potentially be affected. If screening determines that there are likely to be significant effects, or the significance of effects are uncertain or unknown then it will be recommended that a project is brought forward to full AA.

#### **3.1.2 Stage 2: Appropriate Assessment**

The aim of Stage 2 of the AA process is to identify any adverse impacts that the plan or project might have on the integrity of relevant European Sites. As part of the assessment, a key consideration is 'in combination' effects with other plans or projects. Where adverse impacts are identified, mitigation measures can be proposed that would avoid, reduce or remedy any such negative impacts and the plan or project should then be amended accordingly, thereby avoiding the need to progress to Stage 3.

#### **3.1.3 Stage 3: Assessment of Alternative Solutions**

If it is not possible during the stage 2 to reduce impacts to acceptable, non-significant levels by avoidance and/or mitigation, stage 3 of the process must be undertaken which is to objectively assess whether alternative solutions exist by which the objectives of the plan or project can be achieved. Explicitly, this means alternative solutions that do not have significant negative impacts on the integrity of a European Site. It should also be noted that EU guidance on this stage of the process states that, 'other assessment criteria, such as economic criteria, cannot be seen as

overruling ecological criteria' (EC, 2002). In other words, if alternative solutions exist that do not have negative impacts on European Sites; they should be adopted regardless of economic considerations.

#### **3.1.4 Stage 4: Imperative Reasons of Overriding Public Interest (IROPI)/Derogation**

This stage of the AA process is undertaken when it has been determined that negative impacts on the integrity of a European Site will result from a plan or project, but that no alternatives exist. At this stage of the AA process, it is the characteristics of the plan or project itself that will determine whether the competent authority can allow the plan or project to progress. This is the determination of 'over-riding public interest'. It is important to note that in the case of European Sites that include in their qualifying features 'priority' habitats or species, as defined in Annex I and II of the Directive, the demonstration of 'overriding public interest' is not sufficient and it must be demonstrated that the plan or project is necessary for 'human health or safety considerations'. Where plans or projects meet these criteria, they can be allowed, provided adequate compensatory measures are proposed. Stage 4 of the process defines and describes these compensation measures.

## **4 Detailed Methodology for Stage 1: AA Screening**

### **4.1 Methodology**

This AA screening report has been completed in the following logical order:

- Definition of the zone of influence for the proposed works;
- Identification of the European Sites that are situated (in their entirety or partially) within the zone of influence of the proposed works;
- Identification of the most up-to-date Qualifying Interests (QIs) for each European Site occurring either wholly or partially within the zone of influence;
- Identification of the environmental conditions that maintain the QIs at the desired target of Favourable Conservation Status;
- Identification of the threats/impacts – actual or potential that could negatively impact the environmental conditions of the QIs within the European Sites;
- Highlighting the activities of the proposed works that could give rise to significant negative impacts; and
- Identification of other plans or projects, for which In-combination impacts would likely have significant effects.

The following issues have been considered:

- The nature and quality of habitats within the site of the proposed development;
- Information relating to the ecology of the Natura 2000 site;
- The status of Qualifying Interests of the Natura 2000 site (Annex I habitats and Annex II species of the EU Habitats Directive) and the relevant conservation status and objectives for these species;
- The key structural and functional relationships maintaining the integrity of the Natura 2000 site;
- The status of other annexed habitats and species occurring in proximity to the site of the proposed development; and
- The scale and nature of the aspects of the project in relation to the Natura 2000 site.

### **4.2 Information Consulted for this Report**

A general assessment of the site was carried out in line with the Heritage Council Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.*, 2011) and habitats were classified to level 3 of the Fossitt (2000) classification system. To illustrate the general habitat quality, photographs



were taken using a digital camera. Grid references were recorded using a GPS handset. Site evaluation is based on the guidelines of the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).

Sources of data reviewed as part of the Screening process for this project included:

- Conservation Objectives: River Finn SAC (002301) (NPWS, 2017a);
- River Finn SAC Conservation objectives supporting document - blanket bogs and associated habitats (NPWS, 2017b);
- Conservation Objectives: River Foyle and Tributaries SAC (UK0030320) (DAERA, 2017);
- Habitats and Species Baseline Report (W3639-BLP-R-E-009) (ByrneLooby, 2022);
- Invasive Species Management Plan (W3639-BLP-R-E-012) (ByrneLooby, 2021);
- National Biodiversity Data Centre (NBDC) – 1km- and 2km-square species reports (accessed online on 08/04/2022);
- The status of EU Habitats and Species in Ireland (Article 17 Reports) (NPWS, 2019b)
  - GIS spatial data<sup>1</sup>

### 4.3 Cumulative and In-combination Impacts

It is a requirement of Appropriate Assessment that the cumulative or in-combination effects of the proposed development together with other plans or projects are assessed. Cumulative impacts can be defined as a project/plan/programme likely to have a significant effect thereon, either individually or in combination with other plans or projects.

#### 4.3.1 Methodology

In accordance with EC Article 6 Guidance Document (EC 2018), in order to ensure all impacts upon the site are identified, including those direct and indirect impacts that are a result of cumulative impacts, the following steps were completed:

- Identify all projects/ plans which might act in combination: Identify all possible sources of effects from the project or plan under consideration, together with all other sources in the existing environment and any other effects likely to arise from other proposed projects or plans.
- Impacts identification: Identify the types of impacts that are likely to affect aspects of the structure and functions of the site vulnerable to change.

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<sup>1</sup> <https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17>

- Define the boundaries for assessment: define boundaries for examination of cumulative effects which will be different for different types of impact and may include remote locations.
- Pathway identification: Identify potential cumulative pathways (e.g. via water, air etc.; accumulations of effects in time or space).
- Prediction: Prediction of magnitude/extent of identified likely cumulative effects.
- Assessment: Comment on whether or not the potential cumulative impacts are likely to be significant.

## **5 The Proposed Ground Investigation**

### **5.1 The Site Investigation**

The methodology has been outlined for the following forms of investigation works:

1. Boreholes;
2. Trial pits; and
3. Inspection pits.

The works are expected to be carried out over a period of approximately 2 weeks. These are currently programmed for July 2022.

### **5.2 Description of Works Elements**

The various components of the GI works are described below.

#### **5.2.1 Boreholes**

Prior to commencement of exploratory holes, a CAT scan of the area will be carried out and services drawings consulted. A walkover will be undertaken to assess site specific risks and to ensure boreholes are positioned in the most appropriate locations considering the location of overhead wires, underground services, environmental receptors and topography.

Plant: Dando 200 percussion drilling rig or similar, Mini- excavator for land reinstatement.

The works will be carried out as follows:

- Access by the plant to all borehole locations will be along public roads.
- The Engineer will identify and mark the borehole location.
- Heras fencing will be erected to secure the works area.
- A temporary bund will be established around the work area to prevent runoff to surface water.
- Environmental protection measures will be established *e.g.* spill kits, *etc.*
- The drilling will be carried out using a cable percussion rig operated by a foreman and assistant driller. A hand pit will be carried out initially where required. Where rock is encountered, a rotary drilling rig will be used to continue the hole to the required depth.
- The cable percussion rig will be positioned to drill at the required location and is lifted into position using its own wire rope and winch.

- The borehole is then executed, with arising side cast and the relevant samples taken.
- The excess is used to either refill the hole on completion, or carted off to a licensed/permited waste facility.
- On completion of the borehole, the areas will be reinstated and the roads reinstated to original condition.

Upon Completion of Works the borehole area will be left tidy and secure, spoil will be removed. Covers will be placed over boreholes as required by Ground Investigation Specification. The surface will be re-instated as required by Ground Investigation Specification.



Figure 5.1. Photo of typical borehole arrangement

### 5.2.2 Trial Pits, Slit Trenches and Inspection Pits

Prior to commencement of exploratory holes, a CAT scan of the area will be carried out and services drawings consulted. A walkover will be undertaken to assess site specific risks and to ensure trial pits are positioned in the most appropriate locations considering the location of overhead wires, underground services, environmental receptors and topography.

Plant: Standard wheeled or tracked excavator; Mobile pumps for dewatering. Excavator operator checks all attachments before commencement.

A typical trial pit will stay open for less than 6 hours and be backfilled within the same day of opening. It is not intended to leave any trial pits open overnight.

The works will be carried out as follows:

- Access to all locations will be along public roads.
- The Engineer will identify and mark the excavation location.
- Heras fencing will be erected to secure the works area.

- A temporary bund will be established around the work area to prevent runoff to surface water.
- Environmental protection measures will be established e.g. spill kits, etc.
- The excavator will be positioned at the foot of the pit and the Engineer at the head of the pit.
- The location for the excavated spoil will be identified and agreed with the excavator operator and the location suitably bunded to prevent any runoff to surface water.
- The location will be to one side of the pit and will be selected to ensure that the maximum potential quantity of spoil (dependant on depth of pit required) can be stored away from the edge of the pit and away from any surface water.
- At the end of the excavation process the trial pit will be photographed and backfilled.

Upon Completion of Works the pit area will be left tidy and secure and excess spoil will be removed. The surface will be re-instated as required by the Ground Investigation Specification.



Figure 5.2. Photo of typical Trial Pit arrangement.





Figure 5.3. Photo of typical Inspection Pit arrangement (hand dug on the left, machine dug on the right).

### 5.2.3 Dynamic Probes

Prior to Works a CAT scan of the area will be carried out and services drawings consulted. A walkover will be undertaken to assess site specific risks and to ensure probe locations are positioned in the most appropriate locations considering the location of overhead wires, underground services and topography. No soil recovery or spoil will be generated as method involves driving a fixed cone into the ground using a high frequency percussive hammer.

Plant: DPH (Dynamic Probing Heavy) rig (see Figure 5.4). No excavators required.

The works will be carried out as follows:

- Access by the plant to all probe locations will be assessed on site.
- The engineer will identify and mark the probe location.
- Heras fencing will be erected to secure the works area. A hand pit will be carried out where required.
- A temporary bund will be established around the work area to prevent runoff to surface water.
- Environmental protection measures will be established e.g. spill kits, etc.
- The probing will be carried out using a high frequency percussive hammer rig operated by a foreman and assistant.

- No soil recovery or spoil will be generated as method involves driving a fixed cone into the ground using a high frequency percussive hammer.

Upon Completion of Works the area will be left tidy and secure. The surface will be re-instated as required by Ground Investigation Specification.



Figure 5.4. Photo of typical dynamic probe operation.

## 6 Preliminary Screening Assessment of European Sites

### 6.1 Introduction

This section provides a Preliminary Screening Assessment to identify QIs of SACs and SCIs of SPA to be assessed fully in the Screening of Potential Impact (Section 7).

### 6.2 Summary of Natura 2000 Sites within the 15km Zone of Influence

Best practice guidance (DEHLG, 2009) recommends that all Natura 2000 sites within 15km of a project be initially screened for impacts.

There is 1 Special Protection Area (SPA) and 5 Special Areas of Conservation (SAC) within 15km of the urban area of Ballybofey-Stranorlar as listed in Table 6.1 and shown in Figure 6.1.

Table 6.1. Natura 2000 Sites within 15km of the proposed works area

Type	Site Code	Site Name	County	Connectivity
SAC	000129	Croaghonagh Bog	Donegal	No
SAC	002301	River Finn	Donegal	Yes (adjacent, hydrological*, some GI locations within SAC boundary)
SAC	UK0030320	River Foyle and Tributaries	Northern Ireland	Yes (hydrological – ~17.5 km downstream)
SAC	UK0030211	Moneygal Bog	Northern Ireland	No

\*in this instance, the potential hydrological link would be as a result of surface run off from the works locations into the adjacent watercourse.

#### 6.2.1 Natura 2000 Sites with Connectivity to Proposed GI Works

Of the sites mentioned in Table 6.1 above, connectivity exists between the proposed GI footprint and River Finn SAC (see Figure 6.2) and River Foyle and Tributaries SAC. It should be noted that these two SACs share approximately 23km of the same watercourse – from Clady to Magheramason, which correlates with the location of the border with Northern Ireland.

Considering the lack of connectivity between the proposed site and Croaghonagh Bog SAC and Moneygal Bog SAC, significant effects on these sites are not considered likely. These sites are therefore screened out from further assessment. The rest of this report will therefore focus on potential impacts to River Finn SAC and River Foyle and Tributaries SAC.



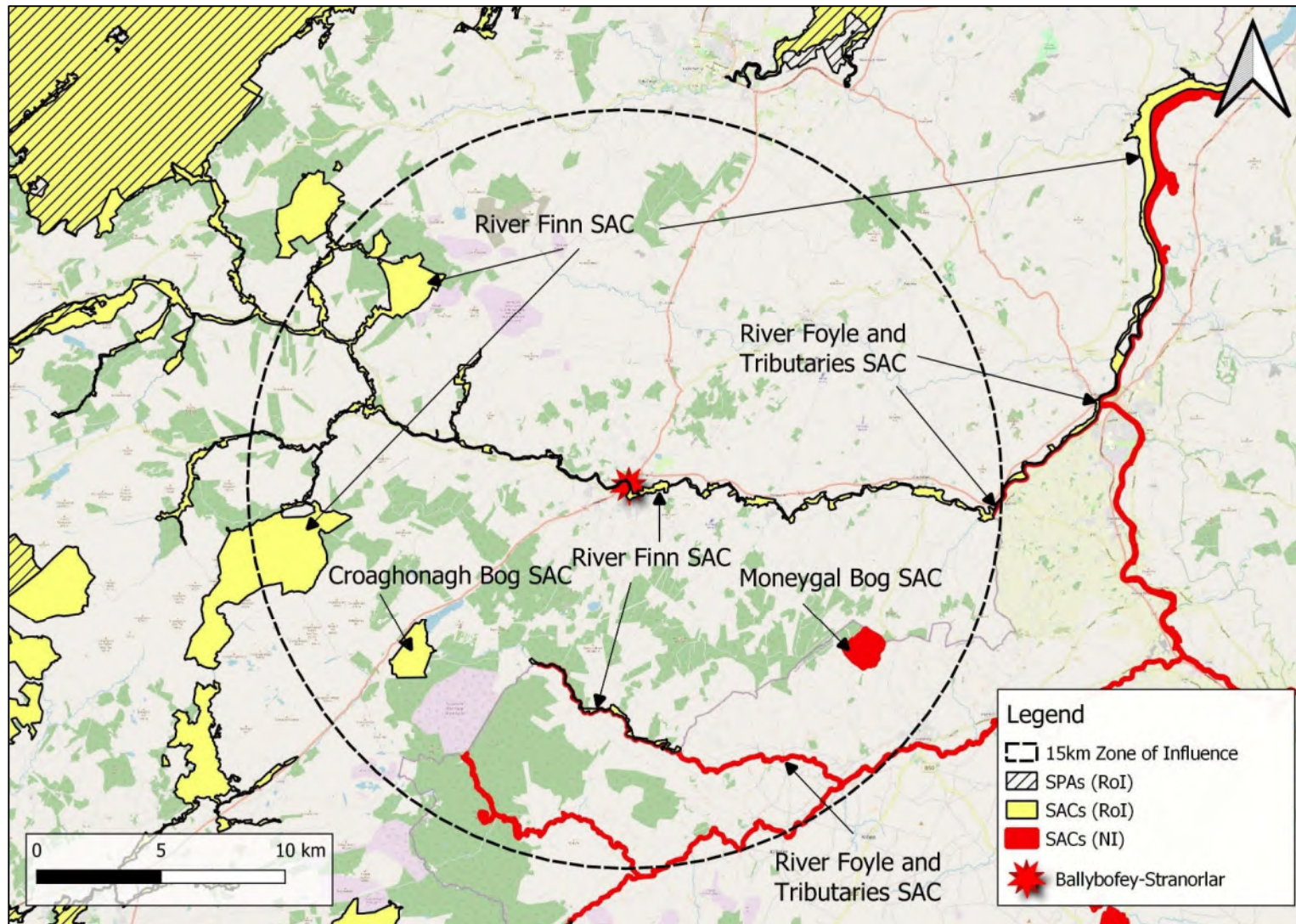


Figure 6.1. Natura 2000 Sites within 15km of Ballybofey-Stranorlar.

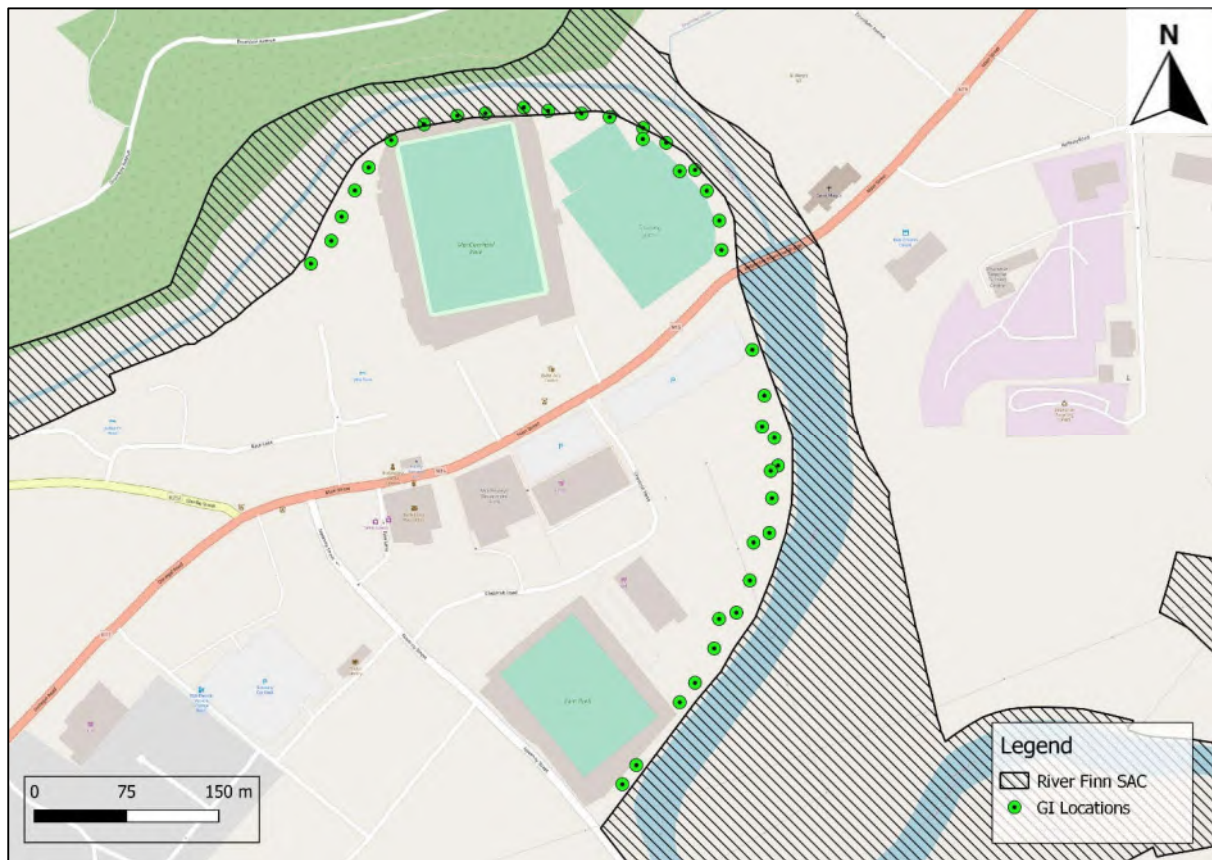


Figure 6.2. Proximity of River Finn SAC relative to proposed GI locations.

#### 6.2.1.1 River Finn Special Area of Conservation

This SAC is of high conservation value for the following Qualifying Interest (QI) habitats and plant and animal species):

##### Habitats

- 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- 4010 Northern Atlantic wet heaths with *Erica tetralix*
- 7130 Blanket bogs (\* if active bog)
- 7140 Transition mires and quaking bogs

##### Species

- 1355 Otter (*Lutra lutra*)
- 1106 Salmon (*Salmo salar*).

### 6.2.1.2 River Foyle and Tributaries Special Area of Conservation

This SAC is of high conservation value for the following Qualifying Interest (QI) habitats and plant and animal species):

#### Habitats

- 3260 Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitriche-Batrachion* vegetation

#### Species

- 1355 Otter (*Lutra lutra*)
- 1106 Salmon (*Salmo salar*).

## 6.3 Survey Methodology

### 6.3.1 Development Site Habitat Assessment Methods

Initial field work to assess the potential of the scheme area to support Qualifying Interests (QIs) and/or Special Conservation Interests (SCIs) of the Natura 2000 sites (as described in Section 6.2.1) was carried out on 21-22/09/2021, by way of an extended habitat survey.

The habitat survey was carried out in accordance with the guidelines set out in ‘Best Practice Guidance for Habitat Survey and Mapping’ (The Heritage Council, 2011). Habitats were classified in accordance with the system outlined by Julie Fossitt (The Heritage Council, 2000). This habitat survey method was extended in accordance with the “Guidelines for Ecological Impact Assessment in the UK and Ireland” (CIEEM, 2018) through the additional recording of specific features indicating the presence, or likely presence, of protected species or other species of nature conservation significance.

### 6.3.2 QI Habitats Assessment Methods

The determination of the presence or absence of Annex I habitats (per Annex I of the EU Habitats Directive) was carried out in consultation with the habitat descriptions provided in the most recent Article 17 Reports (NPWS, 2019). The Interpretation Manual of European Union Habitats (EUR 28, April 2013)<sup>2</sup> was also consulted. In addition, the spatial GIS data for the Article 17 Reports were examined to determine the distribution of these habitats (as known to the NPWS) within the study area.

Further information on the range and distribution of these habitats was obtained from the literature available from the NPWS on the applicable Natura 2000 sites (see Section 4.2). Online aerial photography (Google) was also used as a resource.

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<sup>2</sup> [https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int\\_Manual\\_EU28.pdf](https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf)



### 6.3.3 QI/SCI Species Assessment Methods

Available literature and data (see Section 4.2) were first checked to establish the known distribution of species listed as QIs or SCIs of the Natura 2000 site.

The status of protected species possibly occurring in the watercourses adjacent to, or downstream of the site of the proposed development was assessed as follows:

- The habitat quality for salmon (*Salmo salar*) was assessed, based on the criteria outlined by Kennedy (1984) and by Bardonnet and Baglinière (2000) for the physical instream requirements of this species for spawning, nursery and adult habitat.
- The presence of otter (*Lutra lutra*) was checked for by a survey of the bankside for holts or couching sites and an examination of hard bankside surfaces for the presence of spraints and bankside mud/sand for imprints. The habitat quality for this species was assessed, based on the criteria outlined by Chanin (2003). Available records on the distribution of this species were also checked.

### 6.4 Potential Environmental Impacts

With reference to the GI methodology as described in Section 5, the following events are considered to have the potential to occur:

1. Release of sediment in stormwater runoff;
2. Release of hydrocarbons in stormwater runoff;
3. Elevated noise emissions; and
4. Spread of invasive species (see below)

The presence onsite of Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*) has been reported in the Invasive Species Management Plan (ISMP – ByrneLooby, 2021). The proposed GI locations are shown in relation to known locations of invasive species (see Figure 6.3<sup>3</sup>). It should be noted that most invasive species coverage in these areas is largely at the water's edge, to mid-way up the river side of the existing embankment. The GI locations are all proposed on the landward side of the embankment. However, a small number of specimens were noted at the top, near the top, or on the landward side of the embankment near MacCumhaill Park. These are listed in Table 6.2 below (as per ByrneLooby's ISMP) and illustrated in Figure 6.4. As an example, specimen ID 64 is shown in Figure 6.5, which is on the landward side of the public footpath.

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<sup>3</sup> The polygon in the ByrneLooby ISMP (by Finn Park) was removed in favour of the polygons provided for the same area by Donegal County Council.

Table 6.2. Records of invasive species with notable proximity to GI locations (from ISMP – ByrneLooby, 2021).

ID	Species	Coordinates (ING)	Area Coverage (m <sup>2</sup> )	Comments
53	Himalayan balsam	214279.88, 394954.30	1	By footpath, on river side.
54	Himalayan balsam	214266.82, 394954.01	1	By footpath, on river side.
58	Himalayan balsam	214188.20, 394954.79	1	By footpath, on river side.
59	Himalayan balsam	214144.34, 394947.32	7	By footpath and at water's edge.
62	Himalayan balsam	214111.12, 394900.28	1	Small stand, 2m from footpath, river side.
64	Himalayan balsam	214070.35, 394834.88	1	By footpath, landward side.

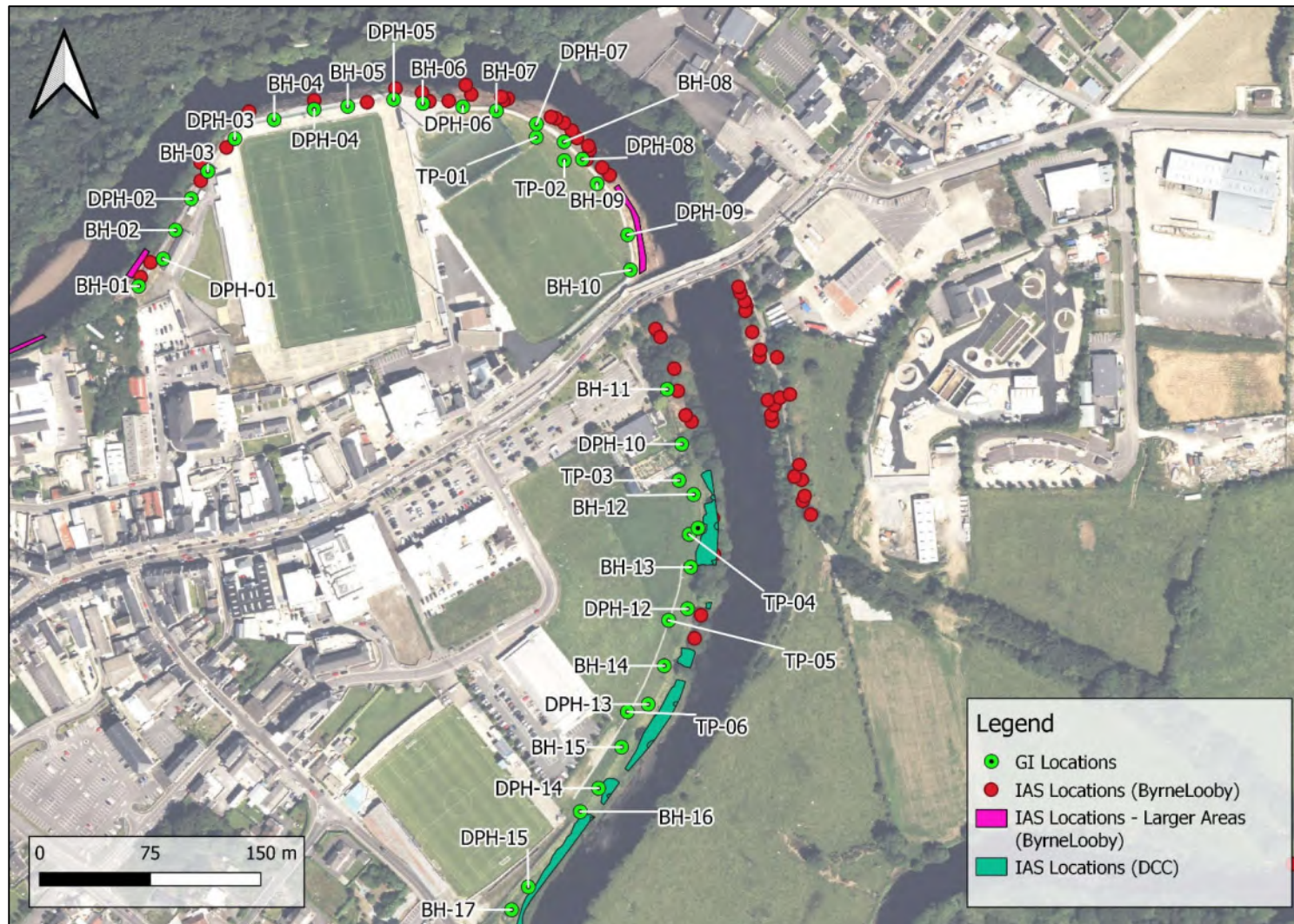


Figure 6.3. Invasive Species Locations.



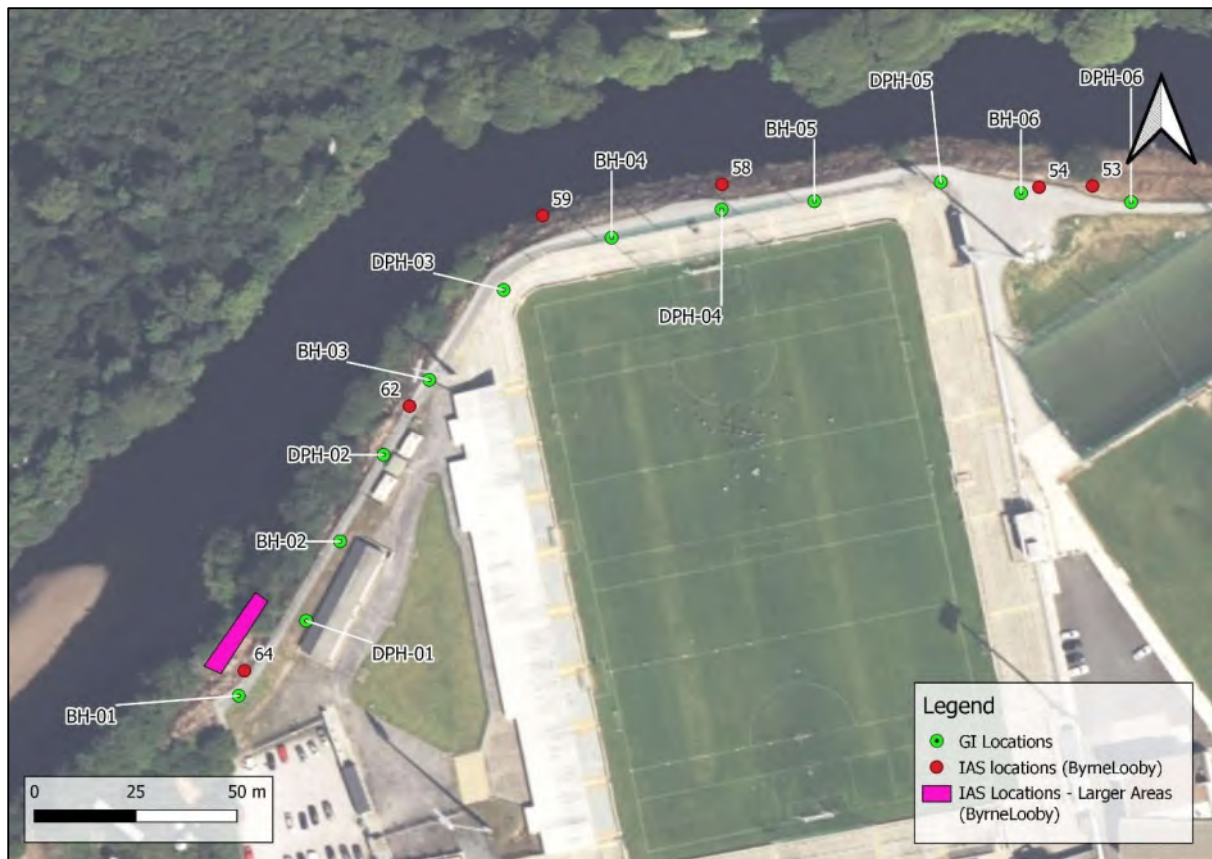


Figure 6.4. Invasive species with notable proximity to GI locations.



Figure 6.5. Himalayan balsam on landward side of public footpath (near BH-03).

The assessment of likelihood of significant effects will consider the risk of impact from sediment, hydrocarbons and noise emissions, as well as the spread of invasive species on the QIs and SCIs of the Natura 2000 sites described in Section 6.2.1.

#### 6.4.1 Potential Zone of Influence

As per guidance from CIEEM (2018), The ‘zone of influence’ for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities.

Consideration was given to the proposed GI locations (refer to drawings in Appendix A) – particularly in relation to their landward positioning on the existing embankment. With this in mind, stormwater runoff from the GI works will not have the potential to discharge to the River Finn.

##### 6.4.1.1 Sediment/Hydrocarbon Release

Considering the presence of the embankment, stormwater runoff will most likely flow in a landward direction before free-draining to ground. A conservative zone of influence of 15 metres has been applied for this scenario.

##### 6.4.1.2 Noise

Noise emissions will arise due to the use of an excavator, drilling rig and dynamic probe plant.

The *de facto* daytime noise limit, as recommended by most local authorities in Ireland, is a sound pressure level (SPL) of 55 decibels (dB).

In calculating a zone of influence for noise emissions, British Standard BS 5228:2009+A1:2014<sup>4</sup> was consulted. According to Table C of the guidance, measured at a distance of 10 metres:

- a 5-tonne tracked mini tracked excavator, while trenching, will emit a SPL of 65 dB; and
- a cable percussion drilling rig will emit a SPL of 74 dB,

In calculating a zone of influence, the larger of the two figures above (74 dB) was used. The zone of influence will be the distance between the source of noise and the point at which the SPL is once again 55 dB.

This distance was calculated by using the sound attenuation formula, as described below:

$$SPL_2 = SPL_1 - 20 * \log (R_2 / R_1)$$

- **SPL<sub>1</sub>** is the Sound Pressure Level at point 1 (74 dB)
- **SPL<sub>2</sub>** is the Sound Pressure Level at point 2 (55 dB)

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<sup>4</sup> Code of practice for noise and vibration control on construction and open sites Part 1: Noise (2014).



- $R_1$  is the distance from the sound source to point 1 (10 m); and
- $R_2$  is the distance from the sound source to point 2 (Zone of Influence).

$R_2$  = 89 metres.

The zone of influence for noise emissions is therefore 89 metres, in all directions.

#### 6.4.1.3 Spread of Invasive Species

The presence onsite of Japanese knotweed and Himalayan balsam has been reported in the Invasive Species Management Plan (ByrneLooby, 2021). The transport offsite of viable seeds and tissue in the soil has the potential to occur via vehicle tyre treads, machinery tracks and the footwear of onsite personnel. In theory, soil could be transported anywhere in the country in this manner.

Due to the existence of the embankment, there is no hydrological connectivity between the GI locations and the River Finn, so downstream transport of viable seeds and/or tissue is considered unlikely.

In terms of assigning a zone of influence for terrestrial soil transport, a conservative range of 10 kilometres has been applied.

The above information pertaining to zones of influence is summarised in Table 6.3. and illustrated in Figure 6.6.

Table 6.3. Potential Environmental Impacts and their Zones of Influence

Process/Emission	Pathway	Zone of Influence
Sediment release	Water	15 m
Hydrocarbon release	Water	15 m
Noise	Air	89 m
Spread of invasive species	Soil transport	10 km

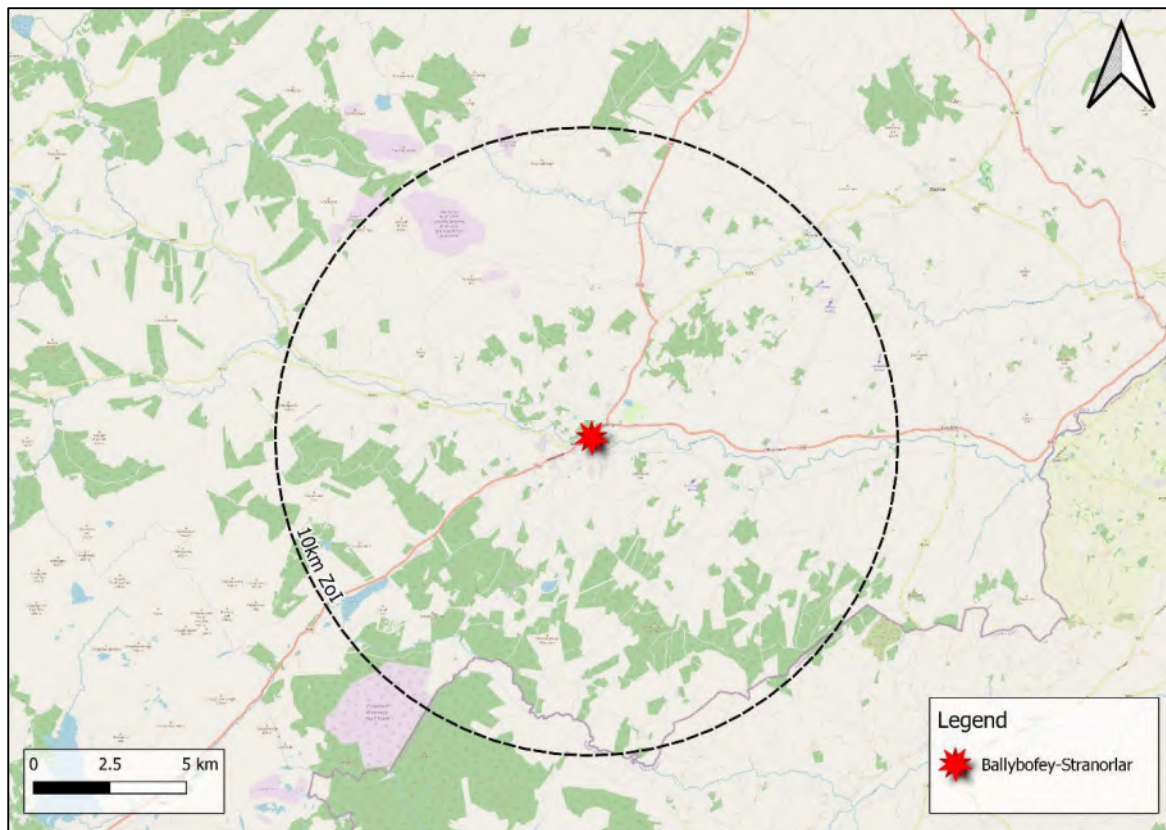


Figure 6.6. 10km Zone of Influence.

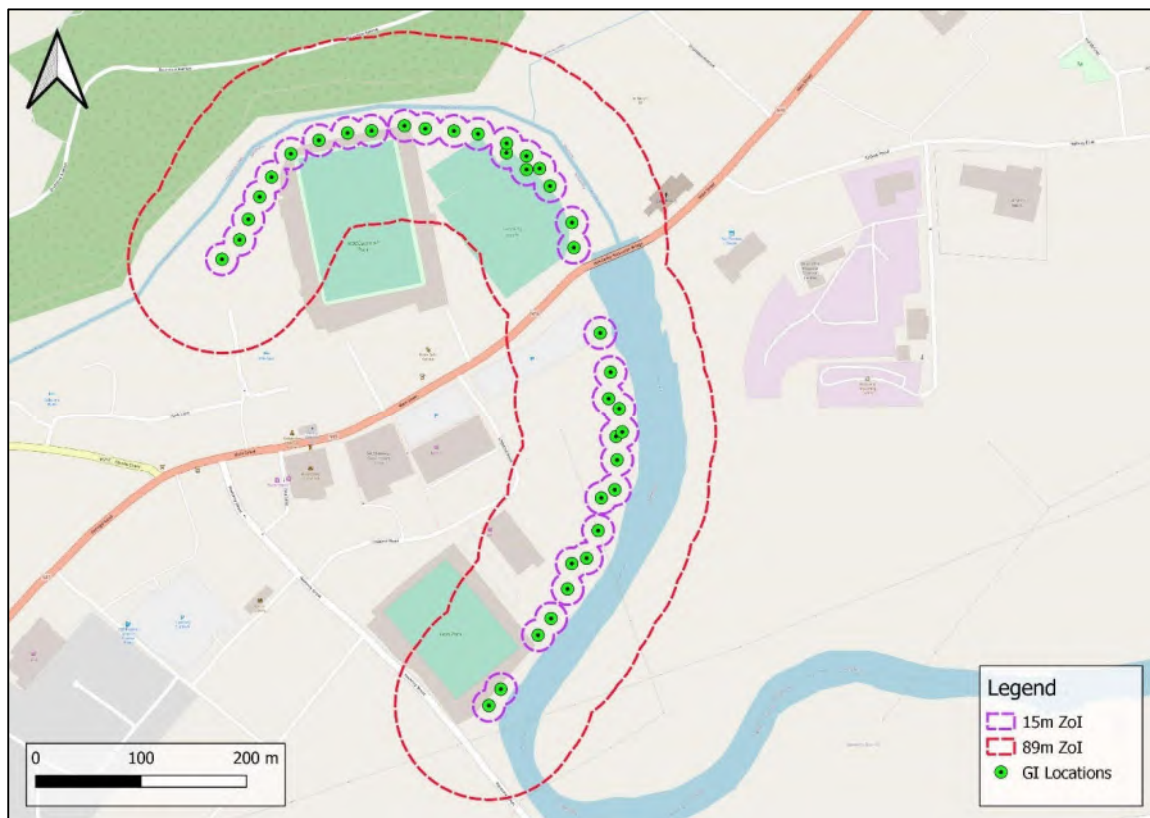


Figure 6.7. 89m and 15m Zone of Influence.



## 6.5 Development Site Conditions

The works are proposed largely on grassland, with some north of the bridge proposed on top of an existing public footpath. These correspond to the habitats (per Fossitt, 2000) Dry Meadows and Grassy Verges (Fossitt code: GS2) and Buildings and Artificial Surfaces (BL3) respectively. The overall setting is predominantly urban.

Water quality in the River Finn has most recently been assigned ‘Poor’ ecological status under the Water Framework Directive (EPA, 2019) – see Figure 6.8. The white line in the image represents the outline of the scheme area.

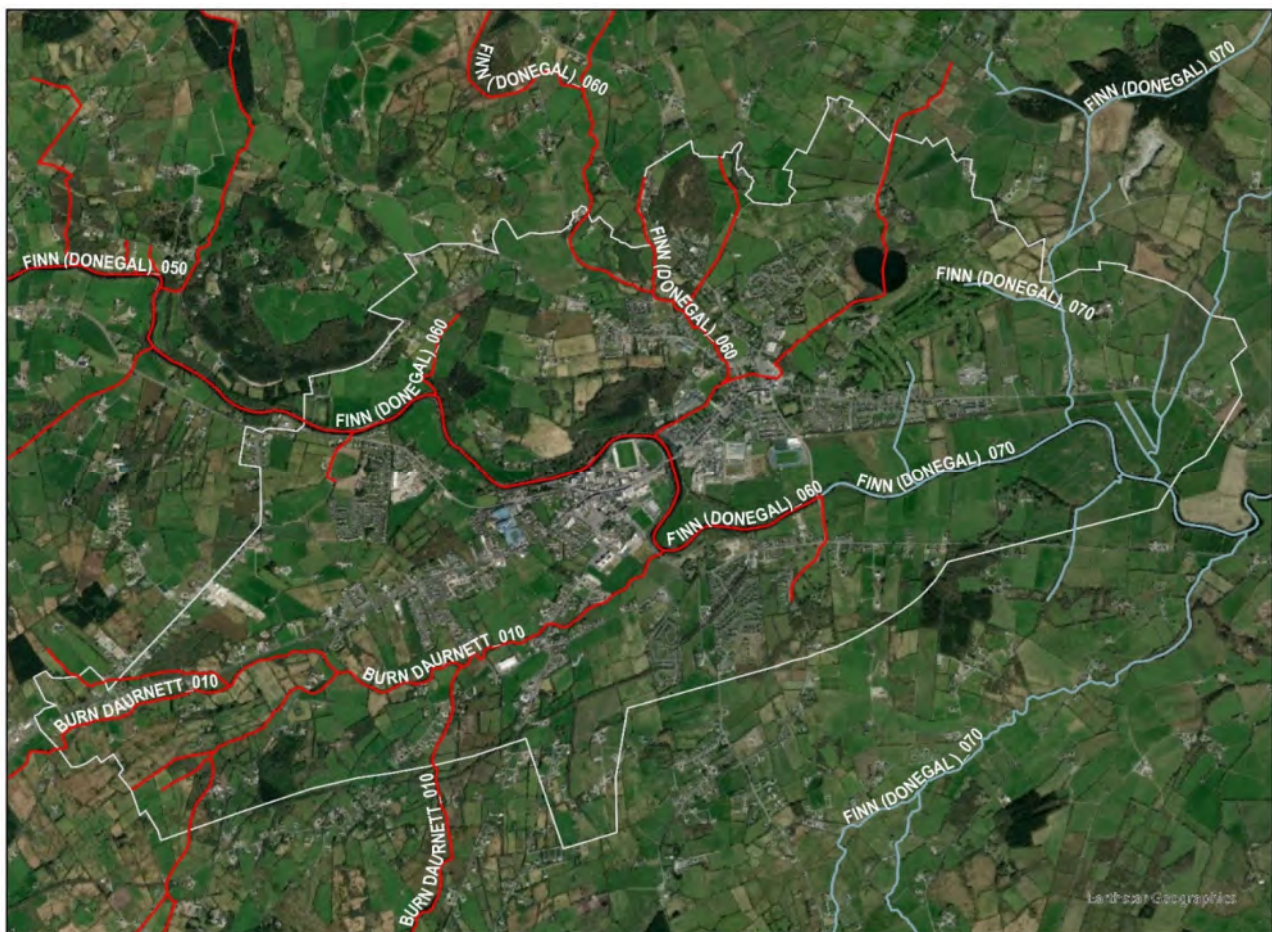


Figure 6.8. WFD Status of Waterbodies where red represents ‘Poor’ ecological status and blue represents unassigned water bodies.

No botanical species protected under the Flora (Protection) Order 2015, listed in Annex II or IV of the EU Habitats Directive (92/43/EEC), listed as Near Threatened, Vulnerable, Endangered and Critically Endangered on Irish Red List No. 10 (Vascular Plants) (Wyse Jackson *et al.*, 2016), otherwise or listed as species of conservation concern in Ireland were recorded for the study site. All species recorded are considered common for similar habitats in Ireland.

## 7 Screening of Potential Impacts to QIs and SCIs

This section provides a description of the confirmed/likely presence/absence of the QI/SCI habitats and species within the zone of influence established in Section 6.4.1.

The proposed GI works are described in detail in Section 5 of this report. This section will consider whether the activities associated with the preliminary site investigation are **likely** to have **significant effects** on the QIs/SCIs of the Natura 2000 site(s), alone or in-combination with other plans/projects.

### 7.1 QI Habitats – River Finn SAC and River Foyle and Tributaries SAC

#### 7.1.1 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)

This habitat is specific to freshwater lakes, none of which was recorded within the proposed works area. According to the NPWS (2017a), this habitat occurs in the larger lakes within the SAC, namely Loughs Derg, Finn and Belshade (see Figure 7.1). Lough Derg is completely removed from the study area in a hydrological context – it feeds into the River Derg, which passes through Castlederg in Co. Tyrone, and ultimately rejoins the River Finn at Lifford, which is downstream of Ballybofey-Stranorlar. Lough Finn is within the catchment of the River Finn, but is approximately 26 km upstream of the study area. Lough Belshade discharges southwards towards Lough Eske, the water from which flows towards Donegal Town and ultimately into the Atlantic at Donegal Bay. As such, it is not within the River Finn catchment at all.

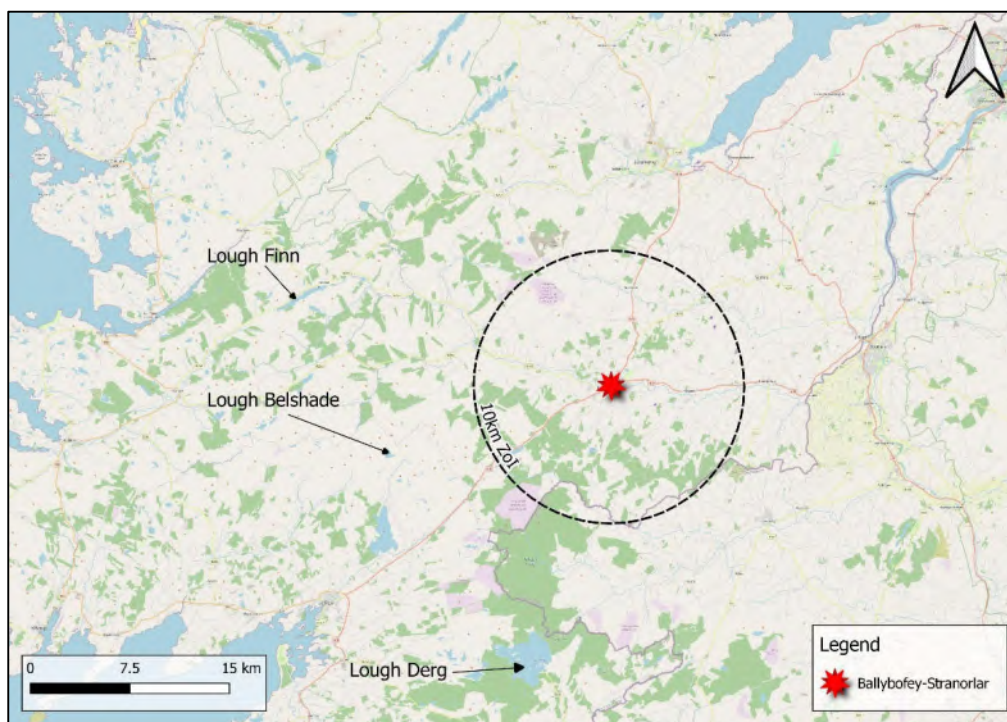


Figure 7.1. Distribution of 3110 - Oligotrophic waters containing very few minerals of sandy plains.



### 7.1.2 3260 Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitriche-Batrachion* vegetation (River Foyle and Tributaries SAC)

This habitat was not observed in the watercourse adjacent to the proposed works area. According to the information contained in the Conservation Objectives document (DOENI, 2017 – see Appendix C), current area coverage is approximately 16.44 hectares. Information on the distribution of this habitat within the SAC was not available. For the purpose of this report, it is assumed to occur at the SAC boundary ~17.5 km downstream.

### 7.1.3 4010 Northern Atlantic wet heaths with *Erica tetralix*

No peatland habitats (including bog, fen or heath) were recorded within the proposed works area. According to the NPWS (2017b), known locations include upland areas around Owendoo and Cloghervaddy, which are near Lough Belshade. Article 17 spatial data (NPWS, 2019) provides the known distribution of this habitat as shown in Figure 7.2. This habitat does not occur within Ballybofey-Stranorlar, nor anywhere downstream.

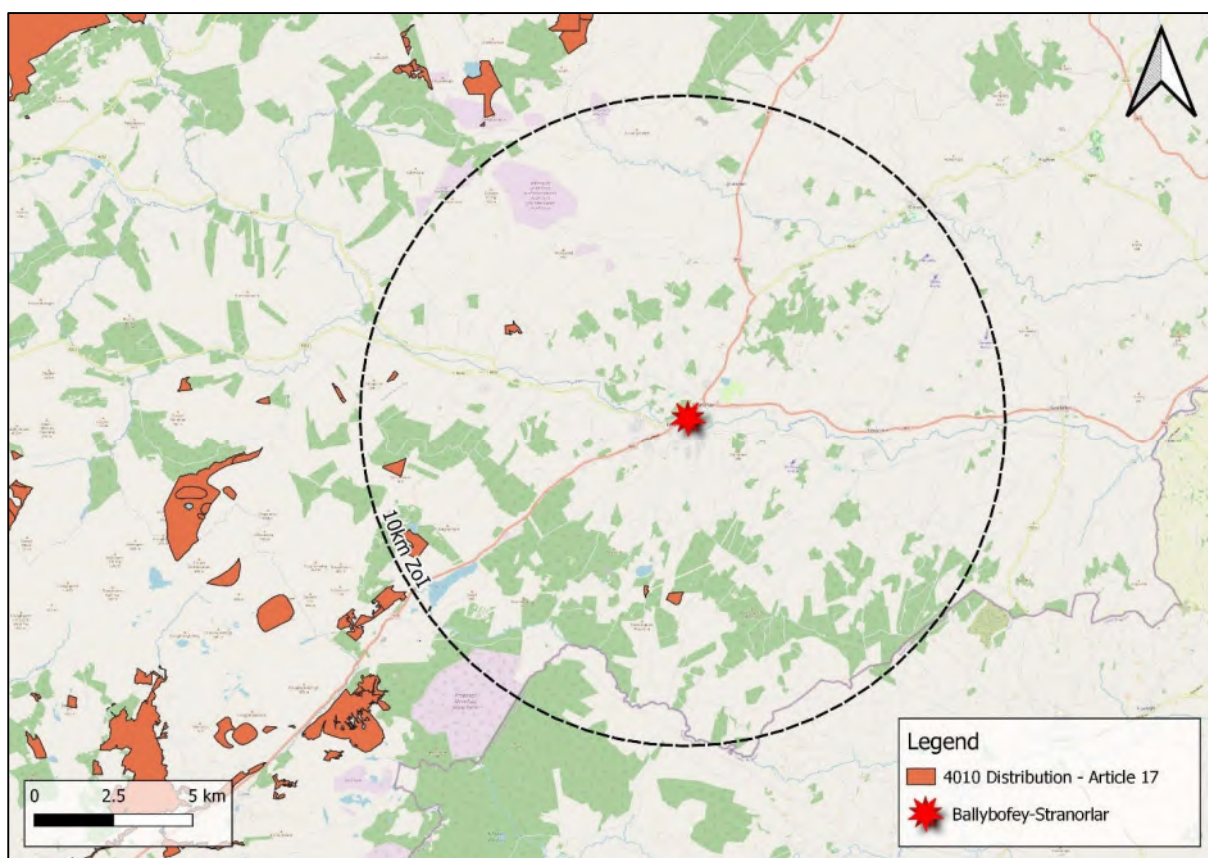


Figure 7.2. Distribution of 4010 - Northern Atlantic wet heaths with *Erica tetralix*.

### 7.1.4 7130 Blanket bogs (\* if active bog)

No peatland habitats (including bog, fen or heath) were recorded within the proposed works area. According to the NPWS (2017b), blanket bogs occur throughout much of the upland areas of the SAC

and along the edges of the river. The most extensive examples are found at Tullytresna and Owendoo/Cloghervaddy. A valley bog is present to the north-east of Lough Finn. Article 17 spatial data (NPWS, 2019) provides the known distribution of this habitat as shown in Figure 7.3. As shown, this habitat does not occur within Ballybofey-Stranorlar, nor anywhere downstream.

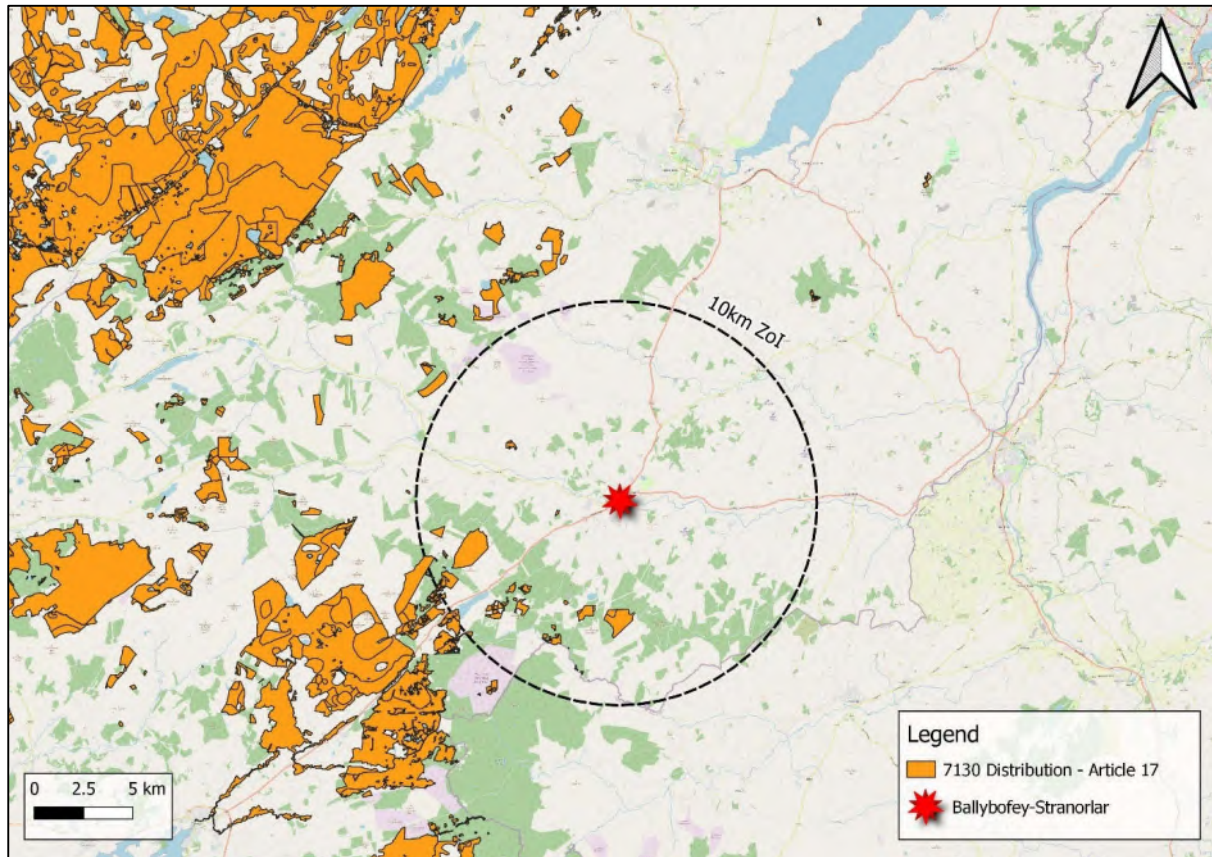


Figure 7.3. Distribution of 7130 Blanket bogs.

#### 7.1.5 7140 Transition mires and quaking bogs

No peatland habitats (including bog, fen or heath) were recorded within the proposed works area. According to the NPWS (2017b), these habitats are documented to occur at the interface between bog and waterbodies. An extensive area is known to occur at Owendoo/Cloghervaddy to the west of the Owendoo River. It is also known to occur in the quaking areas associated with Cronakerny and Cronamuck. Other locations that support this habitat include Tullytresna and the lake edges of Lough Fad, Lough Finn, Lough Gulladuff and the small lakes south of Lough Belshade. Article 17 spatial data (NPWS, 2019) provides the known distribution of this habitat as shown in Figure 7.4. As shown, this habitat does not occur within Ballybofey-Stranorlar, nor anywhere downstream.



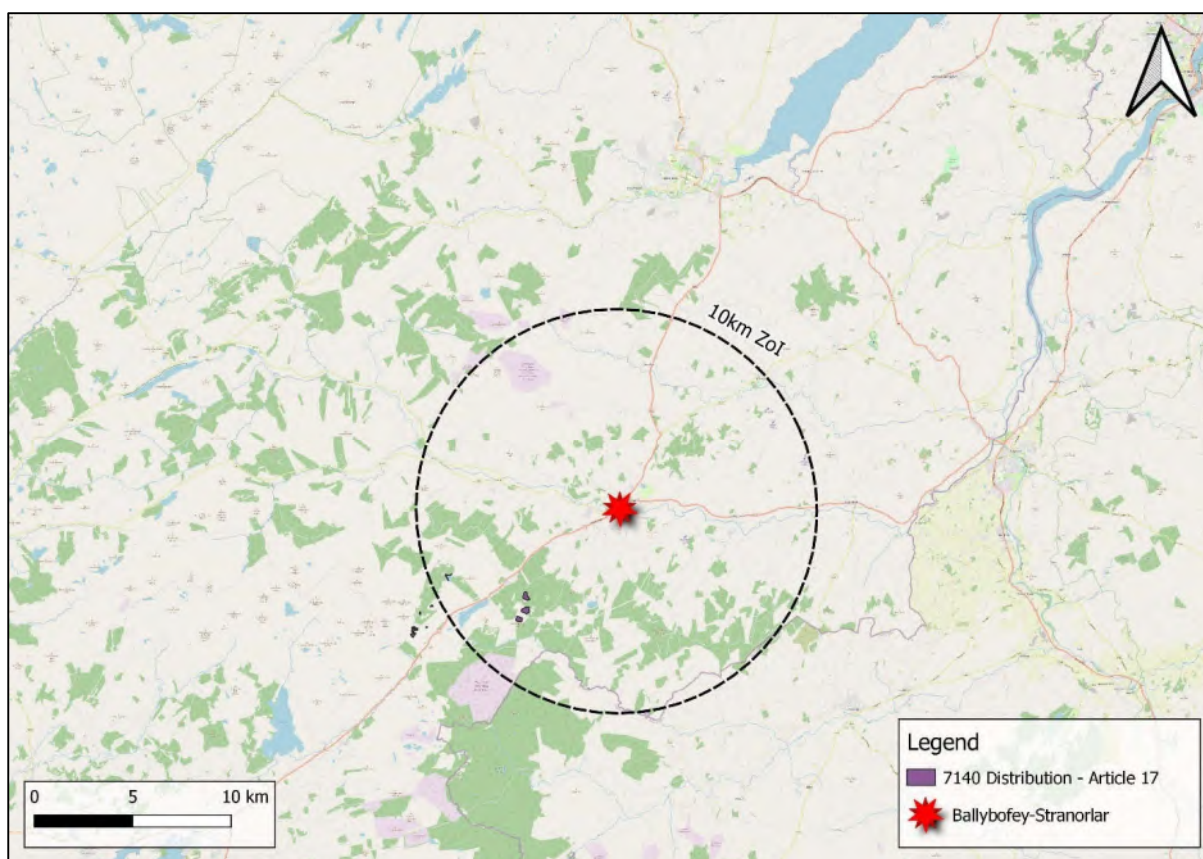


Figure 7.4. Distribution of 7140 - Transition mires and quaking bogs.

## 7.2 QI/SCI Species

### 7.2.1 1106 *Salmo salar* (Atlantic Salmon)

The River Finn is one of the major salmon rivers in the Foyle Catchment. A counter, operational since 2000, is located at Killygordon which is downstream of the study area. The count data is reproduced in Table 7.1 (The Loughs Agency, 2021<sup>5</sup>).

Table 7.1. Salmon count in the River Finn at Killygordon.

Year	Net Up Count for Salmon
2012	2190
2013	2715
2014	3748
2015	2953
2016	2588
2017	1985

<sup>5</sup> <https://www.loughs-agency.org/managing-our-loughs/monitoring/fish-counter-programmes/finn/>

Year	Net Up Count for Salmon
2018	3955
2019	4247
2020	2302

## 7.2.2 1355 *Lutra lutra* (Otter)

### 7.2.2.1 Existing Records

Records available from the National Biodiversity Data Centre (NBDC) within the study area are shown in Table 7.2 below and in Figure 7.5.

Table 7.2. NBDC Records - Otter

ID	Grid Ref.	Date	Precision	Notes
A	H152946	18/04/2005	100m	Spraints found in 2 locations, signs of an otter run along river
A	H152946	01/10/2010	100m	Spraint observed
B	H155962	21/05/2012	100m	Road kill observed
C	H168956	01/04/2018	100m	Sighting of live animal (abundance: 2)
D	H184950	14/03/2012	100m	Sighting of live animal
E	H193949	24/10/1993	100m	Sighting of live animal

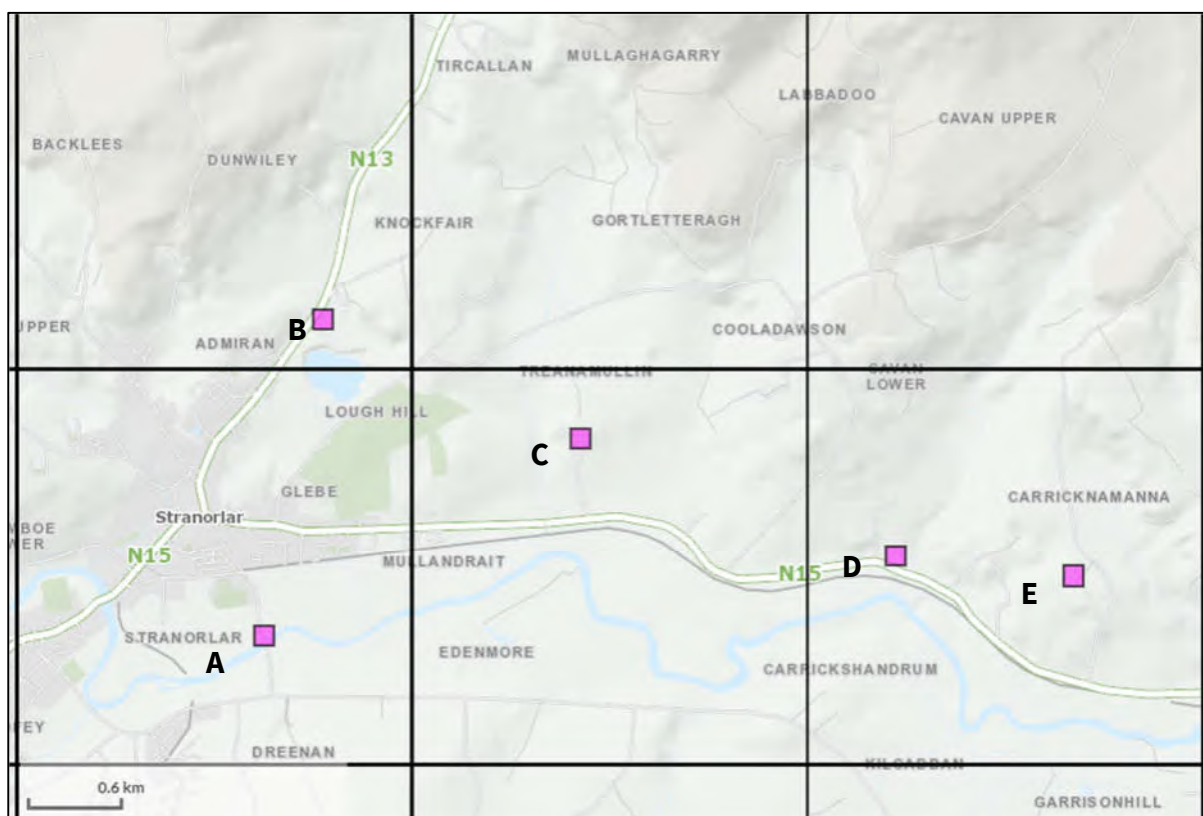


Figure 7.5 NBDC Records for Otter



### 7.2.2.2 Field Survey

Evidence of otter activity recorded during the field surveys is presented in Table 7.3 and the locations shown in Figure 7.6. It should be noted that the 15-metre zone of influence for sediment and hydrocarbon emissions do not apply to these features, as they are on the opposite side of the existing embankment. In relation to noise and other disturbance associated with construction, the NRA (2008) recommends a 20-metre exclusion zone around active otter holts, inside which no construction activities should be permitted. This is shown in Figure 7.6 around holt ID-1. It does not apply to IDs 2 and 3, which were deemed inactive. It is noted that all proposed GI locations are located outside the 20-metre exclusion zone.

Table 7.3. Field Survey Records - Otter

ID	Feature	Notes
1	Holt	River Finn, right bank, ~60m upstream from Ballybofey Bridge. Hair and recent soil disturbance at entrance suggests that the holt is <b>active</b> . River side of embankment.
2	Holt	River Finn, right bank, ~65m downstream from Ballybofey Bridge. No evidence to suggest holt is active. River side of embankment.
3	Holt	River Finn, right bank, ~65m downstream from Ballybofey Bridge. No evidence to suggest holt is active. River side of embankment.



Figure 7.6. Field Survey Records – Otter

### 7.3 Summary of QIs and SCIs Brought Forward to Screening

The likely presence of each Natura 2000 habitat and species within or adjacent to the GI works as well as the assessment of connectivity are summarised Table 7.4 below. Those habitats and species that are definitely, probably or possibly present and those which have connectivity to the works are screened in for further assessment. Those not present/with no connectivity are screened out.

Table 7.4. Habitats and Species within and/or adjacent to the GI works footprint or within applicable Zones of Influence

Qualifying Interests (SACs 002176 and 002287) Special Conservation Interests (SPA 004075)	Definitely or Probably Present and /or Direct connectivity to GI locations	Possibly Present and/or Indirect connectivity to GI locations	Not Present and/or no connectivity to GI locations	Comments
<b>Habitats</b>				
3110 Oligotrophic Waters containing very few minerals of sandy plains			X	Upstream; Not sensitive to terrestrial invasive species.
3260 Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachion</i> vegetation			X	Outside zones of influence; Not sensitive to terrestrial invasive species.
4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>		X		Terrestrial soil transport – invasive species
7130 Blanket bogs		X		Terrestrial soil transport – invasive species
7140 Transition mires and quaking bogs		X		Terrestrial soil transport – invasive species
<b>Species</b>				
1106 Salmon ( <i>Salmo salar</i> )	X			Presence known in River Finn
1355 Otter ( <i>Lutra lutra</i> )	X			Holts (active and inactive) adjacent to proposed works area.

Potential impacts on the following QI/SCI habitats and species which are known to be present, or are possibly present within the zone of influence must be considered in this screening assessment:

- 4010 Northern Atlantic wet heaths with *Erica tetralix*;
- 7130 Blanket bogs;
- 7140 Transition mires and quaking bogs;
- 1106 Atlantic Salmon (*Salmo salar*); and
- 1355 Otter (*Lutra lutra*).

#### 7.4 Assessment of Likelihood of Significant Effects

Table 7.5 provides a summary of the potential impacts of the GI works. Each QI/SCI brought forward to screening is assessed against each of the potential processes/emissions discussed in Section 6.4. In assessing the likelihood of the occurrence of significant effects, the logic is as follows:

1. The conditions necessary for a significant effect are considered, and
2. The likelihood of that effect is assessed, considering the process/emission magnitude, duration, timing and frequency, as well as the connectivity with the proposed GI locations and the sensitivity of the QI/SCI to the process/emission in question.

The below definitions are relevant at this stage:

- Likely Significant Effect - Where a plan or project is likely to undermine any of the site's conservation objectives;
- Possible Significant Effect - Where a plan or project has an indicated potential to undermine any of the site's conservation objectives, but where doubt exists about the risk of a significant effect in the current context. Nevertheless, where doubt exists about the risk of a significant effect, use of the precautionary principle requires this effect to be considered appropriately within the Article 6 assessment process.

It should be noted that this report has taken account of the 2017 ECJ ruling (C-323/17 - People Over Wind and Peter Sweetman v Coillte): "Article 6(3) of the Habitats Directive must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site."

The information presented in Table 7.5 indicates that significant negative effects on QIs/SCIs are **unlikely**.

Table 7.5. Screening of Likely Significant Effects.

QI/SCI	Process/Emission	Potential Impact	Conditions necessary for significant effect	Likelihood of significant effect	Comments
1106 Atlantic Salmon ( <i>Salmo salar</i> )	Sedimentation	Reduction in the availability of spawning habitat.	The magnitude of sediment emissions required to cause a significant effect is uncertain.	Unlikely	GI locations are all landward side of embankment. Effects of any magnitude are unlikely.
	Hydrocarbon Emissions	Mortality/morbidity via direct ingestion.	The magnitude of hydrocarbon emissions required to cause a significant effect is uncertain.	Unlikely	GI locations are all landward side of embankment. Effects of any magnitude are unlikely.
	Noise Emissions	None	N/A	N/A	Noise impacts may cause temporary startling of individuals, but are not predicted to significantly affect important processes such as foraging or breeding.
	Spread of Invasive Species	None	N/A	N/A	Not sensitive to spread of terrestrial flora.
1355 Otter ( <i>Lutra lutra</i> )	Sedimentation	None	N/A	N/A	Not sensitive to sedimentation
	Hydrocarbon Emissions	Mortality/morbidity via direct ingestion or ingestion of contaminated prey. Direct ingestion via grooming after direct contact. Reduction in prey availability.	The magnitude of hydrocarbon emissions required to cause a significant effect is uncertain.	Unlikely	Historical records of otters all river side of embankment, so there is no direct hydrological connectivity with the landward location of the GI footprint. Effects of any magnitude are unlikely.
	Noise Emissions	Discouragement of otters from entering site, thereby creating a barrier for individuals passing through the site <i>en route</i> to holts or foraging sites. Abandonment of holts.	Prolonged operation of plant/machinery between dusk and dawn. Works within 20m of active holt <sup>6</sup>	Unlikely	Works will be confined to daylight hours. None of the proposed GI locations is within 20m of an active holt.
	Spread of Invasive Species	None	N/A	N/A	Not sensitive to spread of terrestrial flora.
	Sedimentation	None	N/A	N/A	Known distribution is upstream of proposed works footprint.

<sup>6</sup> Per NRA (2008), which recommends a 20-metre exclusion zone around active holts.

QI/SCI	Process/Emission	Potential Impact	Conditions necessary for significant effect	Likelihood of significant effect	Comments
4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>	Hydrocarbon Emissions	None	N/A	N/A	Known distribution is upstream of proposed works footprint.
	Noise Emissions	None	N/A	N/A	Not sensitive.
	Spread of Invasive Species	Colonisation by <i>R. japonica</i> and/or <i>Impatiens glandulifera</i> , leading to disruption of floral diversity and ultimately reduction in habitat coverage.	Transport of soil containing viable seeds/tissue between the proposed works site and areas of this habitat.	Unlikely	Construction/earthworks is highly unlikely to be taking place in areas of this habitat. Particularly unlikely is the occurrence of works in which the same plant/machinery or personnel are present at both sites.
7130 Blanket bogs	Sedimentation	None	N/A	N/A	Known distribution is upstream of proposed works footprint.
	Hydrocarbon Emissions	None	N/A	N/A	Known distribution is upstream of proposed works footprint.
	Noise Emissions	None	N/A	N/A	Not sensitive.
	Spread of Invasive Species	Colonisation by <i>R. japonica</i> and/or <i>Impatiens glandulifera</i> , leading to disruption of floral diversity and ultimately reduction in habitat coverage.	Transport of soil containing viable seeds/tissue between the proposed works site and areas of this habitat.	Unlikely	Construction/earthworks is highly unlikely to be taking place in areas of this habitat. Particularly unlikely is the occurrence of works in which the same plant/machinery or personnel are present at both sites.
7140 Transition mires and quaking bogs	Sedimentation	None	N/A	N/A	Known distribution is upstream of proposed works footprint.
	Hydrocarbon Emissions	None	N/A	N/A	Known distribution is upstream of proposed works footprint.
	Noise Emissions	None	N/A	N/A	Not sensitive.
	Spread of Invasive Species	Colonisation by <i>R. japonica</i> and/or <i>Impatiens glandulifera</i> , leading to disruption of floral diversity and ultimately reduction in habitat coverage.	Transport of soil containing viable seeds/tissue between the proposed works site and areas of this habitat.	Unlikely	Construction/earthworks is highly unlikely to be taking place in areas of this habitat. Particularly unlikely is the occurrence of works in which the same plant/machinery or personnel are present at both sites.

## 7.5 Cumulative and In-combination Impacts

It is a requirement of Appropriate Assessment that the cumulative or in-combination effects of the proposed development together with other plans or projects are assessed. Cumulative impacts can be defined as a project/plan/programme likely to have a significant effect thereon, either individually or in combination with other plans or projects.

The following sources were consulted in order to determine if there were any other plans or projects in the area which could result in cumulative impacts<sup>7</sup>:

- Department of Housing, Local Government and Heritage (DHLGH) – Foreshore Applications <https://www.housing.gov.ie/planning/foreshore/applications/>
- DHPLG EIA Portal <https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal>
- Donegal County Council – Planning Enquiry System <https://www.eplanning.ie/DonegalCC/SearchTypes>.

Table 7.6 provides a list of the plans/projects in the immediate vicinity of the proposed GI works, which have the potential to interact. Each plan/project is assessed in terms of the likelihood for in-combination impacts to lead to significant negative effects on Natura 2000 sites.

Significant in-combination effects are not considered likely.

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<sup>7</sup> It should be noted that the CFRAM studies are not considered plans or projects as they do not purport to be an intention to develop. There are numerous other potential developments along the river that may or may not become developments in the future. These have been assessed at a strategic level in the CFRAM study.



Table 7.6. Assessment of In-combination Effects

Plan/Project (Date)	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
National				
Ireland 2040 - Our Plan, the National Planning Framework (and associated National Development Plan)	The National Planning Framework is the Government's high-level strategic plan for shaping the future growth and development of to the year 2040. It is a framework to guide public and private investment, to create and promote opportunities for people, and to protect and enhance the environment – from villages to cities, and everything around and in between.	Published (18/01/2019)	<p>Potential in-combination effect may arise where there is a requirement to provide for new infrastructure or where new development occurs. Provision of infrastructure/development may result in:</p> <ul style="list-style-type: none"> <li>• Habitat loss</li> <li>• Alteration of hydrology</li> <li>• Deterioration in water quality</li> <li>• Disturbance during construction / operation</li> </ul>	This Framework was subject to SEA and AA that incorporated robust mitigation measures to minimise effects. Until project-specific plans are drafted for new development, there is no scope for assessment of in-combination effects.
Grid 25	Grid25 is a high-level strategy outlining how EirGrid intends to undertake the development of the electricity transmission grid in the short, medium and longer terms, to support a long-	Published (2011)	<p>Potential in-combination effect may arise where there is a requirement to provide for new infrastructure or where new development occurs. Provision of infrastructure/development may result in:</p> <ul style="list-style-type: none"> <li>• Habitat loss</li> </ul>	This Framework was subject to SEA and AA that incorporated robust mitigation measures to minimise effects. Until project-specific plans are drafted for new development, there is no scope for assessment of in-combination effects.

Plan/Project (Date)	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	term sustainable and reliable electricity supply.		<ul style="list-style-type: none"> <li>• Alteration of hydrology</li> <li>• Deterioration in water quality</li> <li>• Disturbance during construction / operation</li> </ul>	
Energy Policy framework 2007-2020, Governments White Paper	This policy states that the Government is committed to delivering a significant growth in renewable energy as a contribution to fuel diversity in power generation with a 2020 target of 33% electricity consumption.	Published (2007)	<p>Potential in-combination effect may arise where there is a requirement to provide for new infrastructure or where new development occurs. Provision of infrastructure/ development may result in:</p> <ul style="list-style-type: none"> <li>• Habitat loss</li> <li>• Alteration of hydrology</li> <li>• Deterioration in water quality</li> <li>• Disturbance during construction / operation</li> </ul>	This Framework was subject to SEA and AA that incorporated robust mitigation measures to minimise effects. Until project-specific plans are drafted for new development, there is no scope for assessment of in-combination effects.
Irish Water's Water Services Strategic Plan 2015 and associated Proposed Capital Investment Plan 2020-2024	This Water Services Strategic Plan sets out strategic objectives for the delivery of water services over the next 25 years up to 2040. It details current and future challenges that affect the provision of water services	Published (2015 and 2014)	There is a requirement to provide for new water and wastewater infrastructure and capacity. Meeting additional potable water demands and wastewater treatment demands arising from the proposed increase in population has the potential to adversely affect, in the case of abstractions from and effluent	This Framework was subject to SEA and AA that incorporated robust mitigation measures to minimise effects. Until project-specific plans are drafted for new development, there is no scope for assessment of in-combination effects.

Plan/Project (Date)	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	and identifies the priorities to be tackled in the short and medium term.		<p>discharges to surface waters, the ecological status of surface waters and, in the case of groundwater abstractions, the quantitative status of groundwaters. Such demands would occur in combination with those in adjoining counties. Adverse effects on the ecological status of surface waters and on the quantitative status of groundwaters would have the potential to impact upon protected species and habitats. Provision of infrastructure/development may result in:</p> <ul style="list-style-type: none"> <li>• Habitat loss</li> <li>• Alteration of hydrology</li> <li>• Deterioration in water quality</li> <li>• Disturbance during construction / operation</li> </ul>	
Regional				
Regional Spatial and Economic Strategy (RSES) 2020-2032	The Northern & Western Region Assembly is responsible for the preparation of a RSES	Published (2020)	Potential in-combination effect may arise where there is a requirement to provide for new infrastructure or where new development occurs.	This strategy was subject to SEA and AA that incorporated robust mitigation measures to minimise effects.

Plan/Project (Date)	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	for the Northern and Western Region of Ireland. The RSES provides a long-term regional level strategic planning and economic framework in support of the implementation of the National Planning Framework.		Provision of infrastructure/development may result in: <ul style="list-style-type: none"> <li>• Habitat loss</li> <li>• Alteration of hydrology</li> <li>• Deterioration in water quality</li> <li>• Disturbance during construction / operation</li> </ul>	Until project-specific plans are drafted for new development, there is no scope for assessment of in-combination effects.
County/Local				
Donegal County Development Plan 2018-2024	Overall strategies for the proper planning and sustainable development of the administrative area of Donegal County Council.	Published (2018)	Potential in-combination effect may arise where there is a requirement to provide for new infrastructure or where new development occurs. Provision of infrastructure/development may result in: <ul style="list-style-type: none"> <li>• Habitat loss</li> <li>• Alteration of hydrology</li> <li>• Deterioration in water quality</li> <li>• Disturbance during construction / operation</li> </ul>	This strategy was subject to SEA and AA that incorporated robust mitigation measures to minimise effects.  Until project-specific plans are drafted for new development, there is no scope for assessment of in-combination effects.

Plan/Project (Date)	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
Seven Strategic Towns Local Area Plan 2018 - 2024	The LAP sets out an overall strategy for the proper planning and sustainable development of the seven towns (Dungloe, Ballybofey-Stranorlar, Ballyshannon, Bridgend, Carndonagh, Donegal Town and Killybegs) in the context of the County Donegal Development Plan 2018-2024 (see above) and the Border Regional Authority's Regional Planning Guidelines 2010-2022.	Published (2018)	<p>Potential in-combination effect may arise where there is a requirement to provide for new infrastructure or where new development occurs.</p> <p>The LAP identifies the lands south of the main bridge and west of the River Finn as 'Opportunity Site 1' in the context of having potential for future retail, commercial or tourism development.</p> <p>Provision of infrastructure/development may result in:</p> <ul style="list-style-type: none"> <li>• Habitat loss</li> <li>• Alteration of hydrology</li> <li>• Deterioration in water quality</li> <li>• Disturbance during construction / operation</li> </ul>	Until project-specific plans are drafted for new development, there is no scope for assessment of in-combination effects.
Planning Applications (last 5 years)				
Planning Ref. 20/51636	Upsizing of sewers and decommissioning of storm overflows, between Meetinghouse Lane and	Granted (21/10/2021)	<p>Potential for:</p> <ul style="list-style-type: none"> <li>• Contamination of the watercourse</li> </ul>	Likelihood of significant effects has been reduced via mitigation measures, as proposed in a NIS.



Plan/Project (Date)	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
Irish Water – Sewer Upgrades	Ballybofey Bridge, Stranorlar.		<ul style="list-style-type: none"> <li>Spread of invasive species</li> </ul> Source: AA Screening Report (Irish Water, 2020)	Considering the recent grant of planning permission, mobilisation to site is unlikely to coincide with proposed GI works.
Planning Ref. 18/50232	Extension of Aldi store.	Granted (12/04/2018)	AA screening was not required.	None – works are complete.
An Bord Pleanála Case Ref: JP05E.310657	Ballybofey & Stranorlar Flood Mitigation Measures. Construction of two storm manholes and two pump hardstands behind the Flood Embankments on the River Finn.	Granted (06/12/21)	Potential for: <ul style="list-style-type: none"> <li>Contamination of surface water runoff</li> <li>Spread of invasive species</li> <li>Disturbance to otters</li> </ul> Source: Inspectors Report (An Bord Pleanála, 2021)	Likelihood of significant effects has been reduced via mitigation measures, as proposed in a NIS.  Works on this project are expected to take place across 4 weeks in June. There is unlikely to be a cumulative impact as Ground Investigation works will not be taking place until later in the year.
Foreshore Licence Applications (last 5 years) - None				
EIA Portal (last 5 years) – None				

## 8 Screening Outcome

The Screening exercise was completed in compliance with the relevant European Commission and national guidelines. Article 42 (7) of the European Communities (Birds and Natural Habitats) Regulations 2011 states that: *“The public authority shall determine that an Appropriate Assessment of a plan or project is not required [...] if it can be excluded on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site.”*

The potential impacts during the preliminary site investigation works in Ballybofey-Stranorlar have been considered in the context of the Natura 2000 sites potentially affected, their Qualifying Interests, Special Conservation Interests and Conservation Objectives. It has been concluded that the risks posed by sediment emissions, hydrocarbon emissions, noise emissions and the spread of invasive flora are unlikely to result in significant effects to the Qualifying Interests of River Finn SAC and River Foyle and Tributaries SAC, alone or in combination with other plans or projects.

Further, the Site Investigation works are relatively minor and are small in scale relative to the principal project, of short duration and temporary in nature such that it is identified as exempted development in accordance with Planning and Development Regulations (2001 as amended, Schedule 2, Class 45).

As significant effects on European Sites by virtue of the proposal have been deemed unlikely, it is therefore determined that Appropriate Assessment is not required on this occasion.

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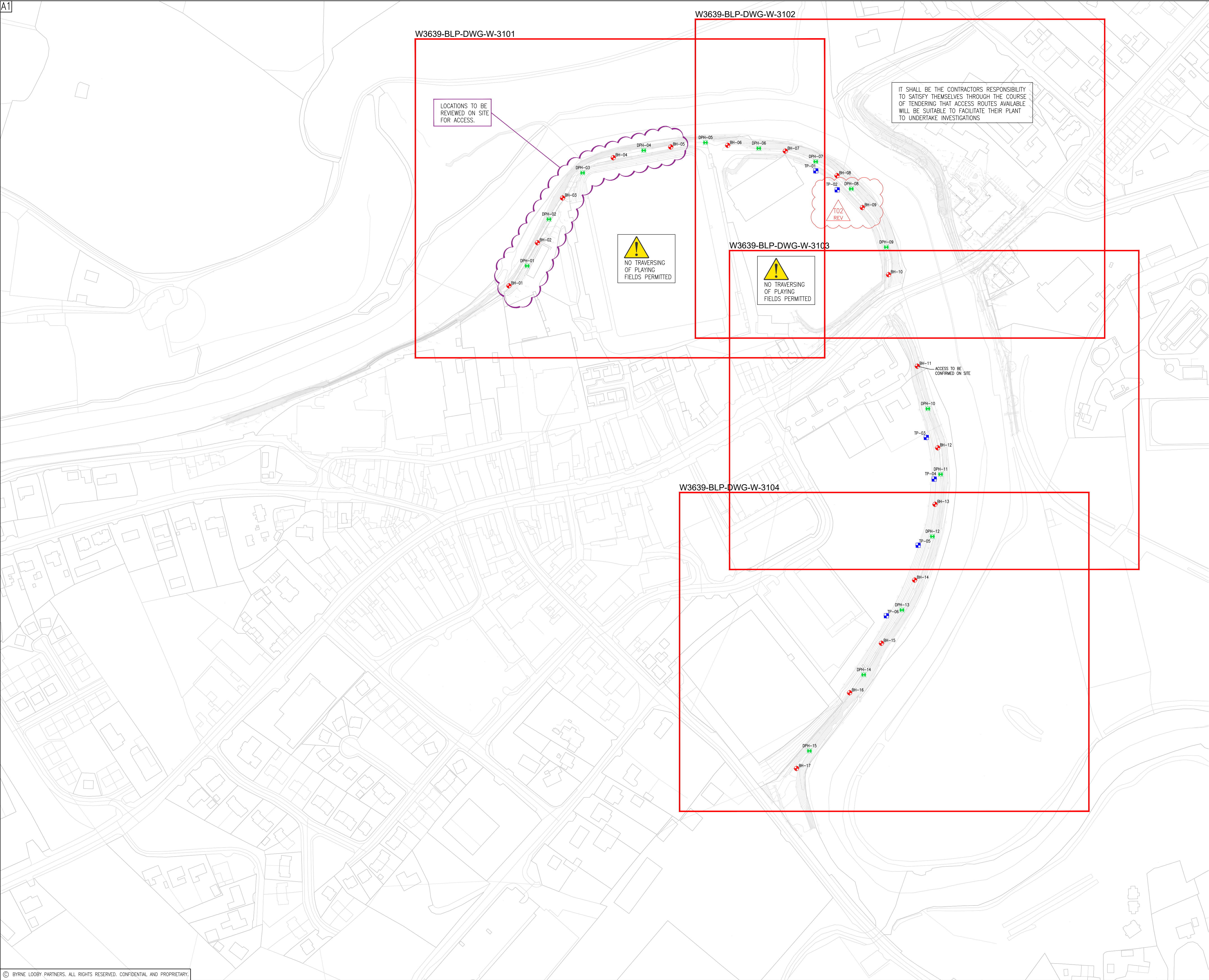
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## **APPENDIX A – Proposed GI Locations**





GENERAL NOTES

- DO NOT SCALE OFF DRAWING – USE FIGURED DIMENSIONS ONLY.
- ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
- ALL LEVELS IN METRES (MALIN HEAD) UNLESS OTHERWISE NOTED.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS DRAWINGS.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE GROUND INVESTIGATION SPECIFICATION (DOCUMENT REF: W3639-BLP-SP-W-001).
- SAFE DIGGING TECHNIQUES TO BE USED FOR ALL EXPLORATORY HOLES. THIS IS TO INCLUDE CAT SCANNING AND HAND DUG PITS TO A DEPTH OF 1.2m FOR ALL LOCATIONS.
- REFER TO SITE INVESTIGATION SPECIFICATION DOCUMENT (DOCUMENT REF: W3639-BLP-SP-W-001) FOR SCHEDULES OF EXPLORATORY HOLES.
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- ANY QUERIES OR DISCREPANCIES SHOULD BE REFERRED TO THE EMPLOYERS REPRESENTATIVE IMMEDIATELY.
- ALL HARDSTANDING AREAS (I.E. ASPHALT, CONCRETE, PAVING SLABS) ARE TO BE FULLY RE-INSTATED AND MADE GOOD FOLLOWING WORKS. WHERE RELEVANT, PAVING SLABS AND BLOCKS ARE TO BE REMOVED CAREFULLY AND STORED SECURELY FOR RE-LAYING FOLLOWING WORKS.

LEGEND:

- BH-01 = CABLE PERCUSSION BOREHOLE WITH ROTARY CORE FOLLOW ON
- TP-01 = TRIAL PIT
- DPH-01 = DYNAMIC PROBE (DPH)
- IP-01 = INSPECTION PIT (WALL/FOUNDATION INSP.)



INVASIVE SPECIES ARE PRESENT ON SITE. CONTRACTOR IS REQUIRED TO ABIDE BY THE IASMP (INVASIVE ALIEN SPECIES MANAGEMENT PLAN) ISSUED IN CONJUNCTION WITH SITE INVESTIGATION SPECIFICATION. CONTRACTOR TO TAKE ALL MEASURES NECESSARY TO ABIDE WITH IASMP AND MAINTAIN BIOSECURITY.

T02	13/05	FOR TENDER	MO'N	PO'B	MR
T01	07/04	FOR TENDER	MO'N	PO'B	MR
P02	28/02	FOR REVIEW (SI LOCATIONS UPDATED)	MO'N	PO'B	MR
P01	27/01	FOR REVIEW	MO'N	PO'B	MR
Rev	Date	Description	By	Chk	App

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PROJECT

DONEGAL BUNDLE 2  
FLOOD RELIEF SCHEME

DRAWING TITLE

BALLYBOFEY SITE INVESTIGATION WORKS  
LOCATION MAP AND OVERALL WORKS  
LAYOUT

STATUS

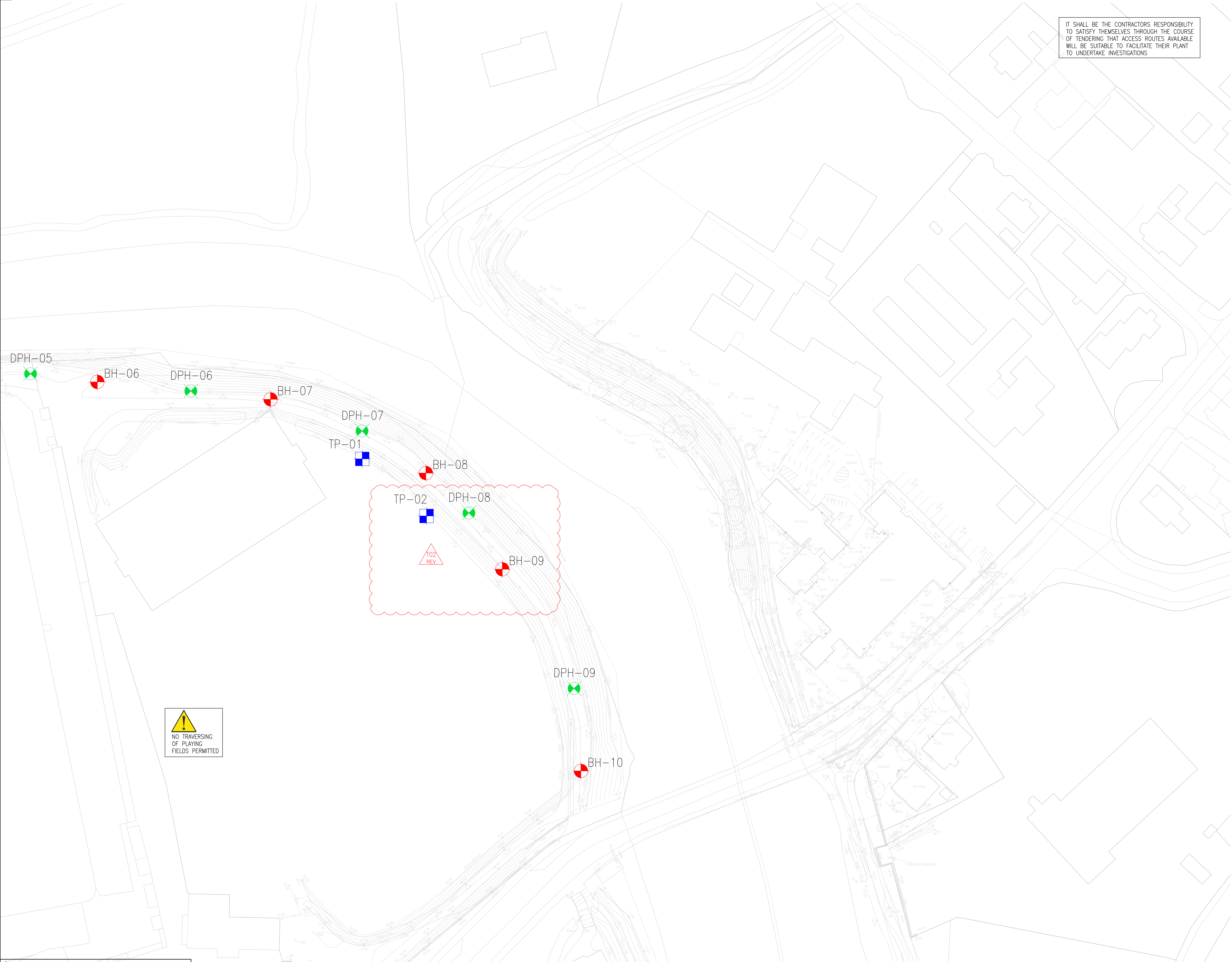
FOR TENDER

Date: 27/01/22	Scale: 1:1500	Drawn: MO'N	Chk: PO'B	App: MR
Project No: B1860	Drw. No: W3639-BLP-DWG-W-3100	Rev: T02		









IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SATISFY THEMSELVES THROUGH THE COURSE OF TENDERING THAT ACCESS ROUTES AVAILABLE WILL BE SUITABLE TO FACILITATE THEIR PLANT TO UNDERTAKE INVESTIGATIONS

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O1	27/01	FOR REVIEW	MO'N	PO'B	MR
Rev	Date	Description	By	Chk	App

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CLIENT



PROJECT

DONEGAL BUNDLE 2  
FLOOD RELIEF SCHEME

DRAWING TITLE

BALLYBOFEY SITE INVESTIGATION WORKS  
LOCATION MAP  
SHEET 02 OF 04

STATUS

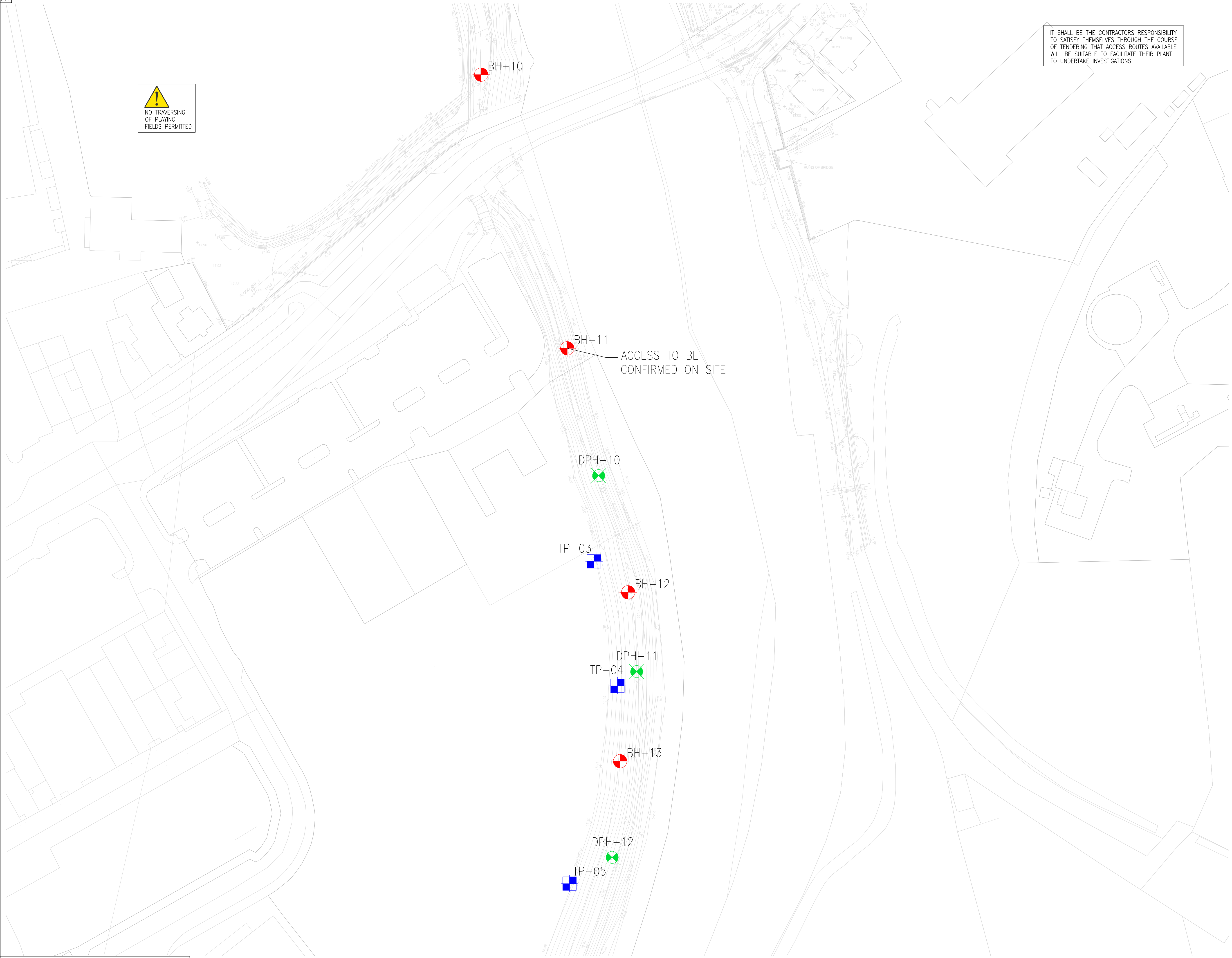
FOR TENDER

Date: 27/01/22	Scale: 1:500	Drawn: MO'N	Chk: PO'B	App: MR
Project No: B1860	Drg. No: W3639-BLP-DWG-W-3102	Rev: T02		





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- REFER TO SITE INVESTIGATION SPECIFICATION DOCUMENT (DOCUMENT REF: W3639-BLP-SP-W-001) FOR IN-SITU TESTING REQUIREMENTS, SAMPLING AND SCHEDULING OF TESTING.
- ANY QUERIES OR DISCREPANCIES SHOULD BE REFERRED TO THE EMPLOYERS REPRESENTATIVE IMMEDIATELY.
- ALL HARDSTANDING AREAS (I.E. ASPHALT, CONCRETE, PAVING SLABS) ARE TO BE FULLY RE-INSTATED AND MADE GOOD FOLLOWING WORKS. WHERE RELEVANT, PAVING SLABS AND BLOCKS ARE TO BE REMOVED CAREFULLY AND STORED SECURELY FOR RE-LAYING FOLLOWING WORKS.

LEGEND:

- = CABLE PERCUSSION BOREHOLE WITH ROTARY CORE FOLLOW ON
- = TRIAL PIT
- = DYNAMIC PROBE (DPH)
- = INSPECTION PIT (WALL/FOUNDATION INSP.)

T01	07/04	FOR TENDER	MO'N	PO'B	MR
P02	28/02	FOR REVIEW (SI LOCATIONS UPDATED)	MO'N	PO'B	MR
O1	27/01	FOR REVIEW	MO'N	PO'B	MR
Rev	Date	Description	By	Chk	App

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CLIENT

**Comhairle Contae Dhún na nGall**  
Donegal County Council

PROJECT

DONEGAL BUNDLE 2  
FLOOD RELIEF SCHEME

DRAWING TITLE

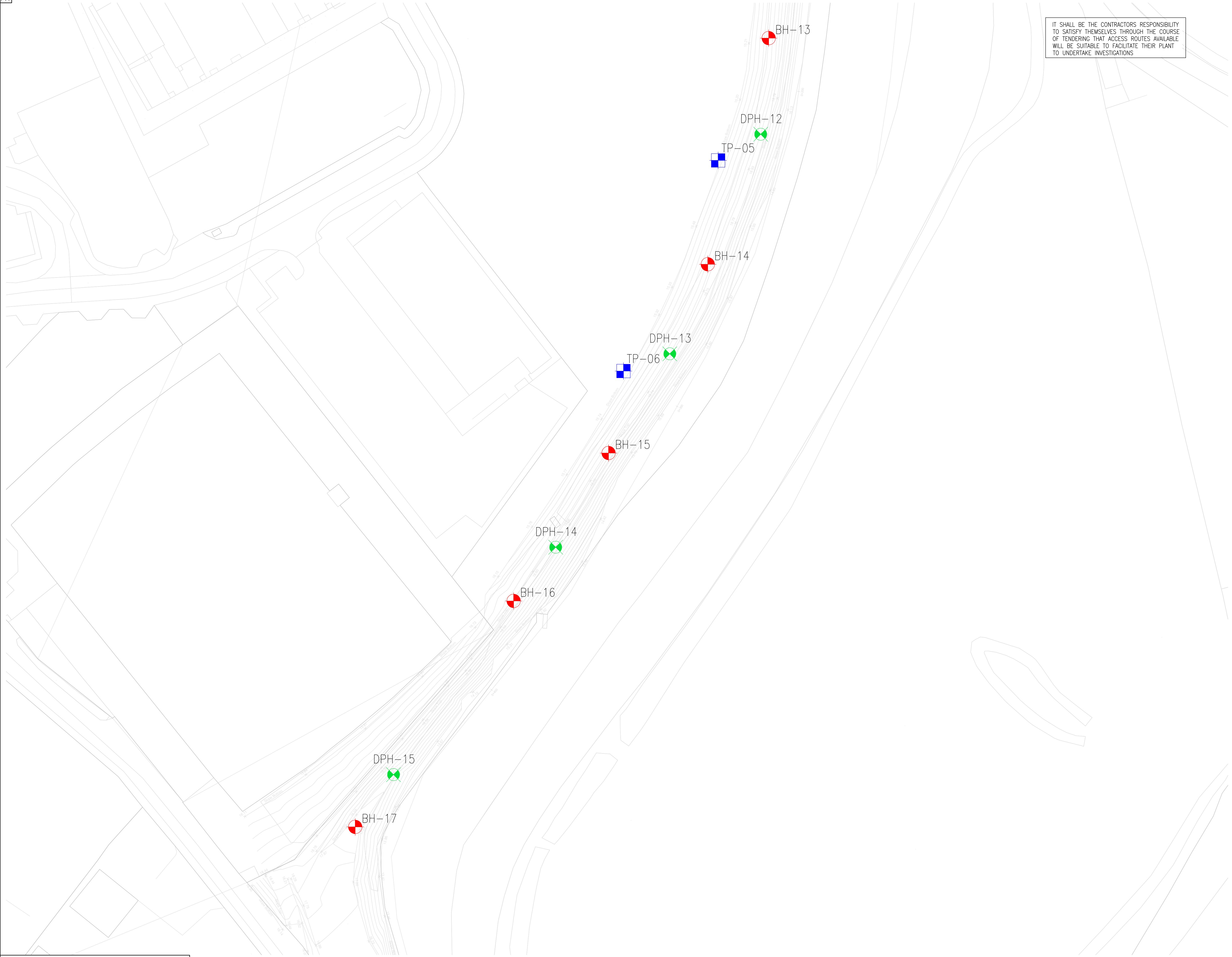
BALLYBOFEY SITE INVESTIGATION WORKS  
LOCATION MAP  
SHEET 03 OF 04

STATUS

FOR TENDER

Date: 27/01/22	Scale: 1:500	Drawn: MO'N	Chk: PO'B	App: MR
Project No: B1860	Org. No: W3639-BLP-DWG-W-3103	Rev: T01		





IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SATISFY THEMSELVES THROUGH THE COURSE OF TENDERING THAT ACCESS ROUTES AVAILABLE WILL BE SUITABLE TO FACILITATE THEIR PLANT TO UNDERTAKE INVESTIGATIONS

GENERAL NOTES

1.

DO NOT SCALE OFF DRAWING – USE FIGURED DIMENSIONS ONLY.

2.

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

3.

ALL LEVELS IN METRES (MALIN HEAD) UNLESS OTHERWISE NOTED.

4.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS DRAWINGS.

5.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE GROUND INVESTIGATION SPECIFICATION (DOCUMENT REF: W3639–BLP–SP–W–001).

6.

SAFE DIGGING TECHNIQUES TO BE USED FOR ALL EXPLORATORY HOLES. THIS IS TO INCLUDE CAT SCANNING AND HAND DUG PITS TO A DEPTH OF 1.2m FOR ALL LOCATIONS.

7.

REFER TO SITE INVESTIGATION SPECIFICATION DOCUMENT (DOCUMENT REF: W3639–BLP–SP–W–001) FOR SCHEDULES OF EXPLORATORY HOLES.

8.

REFER TO SITE INVESTIGATION SPECIFICATION DOCUMENT (DOCUMENT REF: W3639–BLP–SP–W–001) FOR IN–SITU TESTING REQUIREMENTS, SAMPLING AND SCHEDULING OF TESTING.

9.

ANY QUERIES OR DISCREPANCIES SHOULD BE REFERRED TO THE EMPLOYERS REPRESENTATIVE IMMEDIATELY.

10.

ALL HARDSTANDING AREAS (I.E. ASPHALT, CONCRETE, PAVING SLABS) ARE TO BE FULLY RE–INSTATED AND MADE GOOD FOLLOWING WORKS. WHERE RELEVANT, PAVING SLABS AND BLOCKS ARE TO BE REMOVED CAREFULLY AND STORED SECURELY FOR RE–LAYING FOLLOWING WORKS.

LEGEND:

BH–01

= CABLE PERCUSSION BOREHOLE WITH ROTARY CORE FOLLOW ON

TP–01

= TRIAL PIT

DPH–01

= DYNAMIC PROBE (DPH)

IP–01

= INSPECTION PIT (WALL/FOUNDATION INSP.)

INVASIVE SPECIES ARE PRESENT ON SITE. CONTRACTOR IS REQUIRED TO ABIDE BY THE IASMP (INVASIVE ALIEN SPECIES MANAGEMENT PLAN) ISSUED IN CONJUNCTION WITH SITE INVESTIGATION SPECIFICATION. CONTRACTOR TO TAKE ALL MEASURES NECESSARY TO ABIDE WITH IASMP AND MAINTAIN BIOSECURITY.

T01	07/04	FOR TENDER	MO'N	PO'B	MR
P02	28/02	FOR REVIEW (SI LOCATIONS UPDATED)	MO'N	PO'B	MR
O1	27/01	FOR REVIEW	MO'N	PO'B	MR
Rev	Date	Description	By	Chk	App

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CLIENT

Comhairle Contae  
Dhúin na nGall  
Donegal County Council

PROJECT

DONEGAL BUNDLE 2  
FLOOD RELIEF SCHEME

DRAWING TITLE

BALLYBOFEY SITE INVESTIGATION WORKS  
LOCATION MAP  
SHEET 04 OF 04

STATUS

FOR TENDER

Date: 27/01/22	Scale: 1:500	Drawn: MO'N	Chk: PO'B	App: MR
Project No: B1860	Drq. No: W3639–BLP–DWG–W–3104	Rev:	T01	

**APPENDIX B – Schedule of Proposed GI Works**

### Preliminary Cable Percussion Borehole Schedule

11/04/2022

[illegible]

**Notes / abbreviations:**

BH = Borehole in soil, RC = Rotary core, BH/RC = Borehole extended in rock, CPT= Static Cone Penetration Test, TP = Trial Pit, PM = Pressuremeter / Dilatometer Tests, SPP = Standpipe Piezometer, HP= Hand Dug Pit, CH = Constant Head Test, VH = Variable Head Test

\*Installation details to be confirmed by Investigation Supervisor on site based on encountered ground conditions.

**All reinstatement of surfacing to be as per Specification requirements.**

All boreholes to be cable percussion boreholes to depths stated in schedule. If rock is encountered, borehole to be continued using rotary core follow on to a minimum of 5m into intact rock or to depth stated in schedule – whichever is reached first. **Note minimum depth of borehole is 15m.** Investigation supervisor reserves right to instruct for cores to extend further in rock following inspection of initial recovery.

## Ground Investigation Works - Exploratory Hole Schedule - Ballybofey

Preliminary Trial Pit, Slit Trench &amp; Inspection Pit Schedule

Date:

11/04/2022

Exploratory Hole Reference No.	Exploratory Hole Type	Anticipated Exploratory Hole Depth (m)	Anticipated Exploratory Hole Length (m)	Anticipated Exploratory Hole Width (m)	Insitu Testing	Sampling*	Backfill & Reinstatement	Notes
Trial Pits								
TP-01	TP	3.0	See note 1		HV	As instructed by IS	See note 2	
TP-02	TP	3.0	See note 1		HV, SA**	As instructed by IS	See note 2	
TP-03	TP	3.0	See note 1		HV	As instructed by IS	See note 2	
TP-04	TP	3.0	See note 1		HV, SA**	As instructed by IS	See note 2	
TP-05	TP	3.0	See note 1		HV, SA**	As instructed by IS	See note 2	
TP-06	TP	3.0	See note 1		HV, SA**	As instructed by IS	See note 2	

Notes / abbreviations:

TP = Trial Pit, IP = Inspection Pit for Wall/Foundation Investigation, ST = Slit Trench for Utility Search (and Wall/Foundation Investigation where noted), SPP = Standpipe Piezometer, HP= Hand Dug Pit, PLT= Plate Load Test, HV = Hand Vanes, SA = Soakaway (BRE365), IS = Investigation Supervisor

1. TP length and width dependent on ground conditions and safe batter to achieve depth noted - to be determined on site by Contractor. Base of TP to achieve minimum dimensions as per EI Specification. IS to be contacted if trial pit depths become impractical.
2. All TPs, STs and IPs to be backfilled as per Clause S1.11 of Schedule 1. Reinstating surface to be as per Clause 3.16 of the EI Specification. All hard standing surfaces to be made good.

\*Sampling may be taken from TP, IP or ST as instructed by Investigation Supervisor. Refer to BOQ

\*\*Soakaway locations noted are preliminary - subject to findings from investigation.



## **APPENDIX C – Conservation Objectives**

**River Finn SAC**

**River Finn SAC – Conservation Objectives Supporting Document - blanket bogs and associated habitats**

**River Foyle and Tributaries SAC**

# National Parks and Wildlife Service

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## *Conservation Objectives Series*

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### River Finn SAC 002301



An Roinn Ealaíon, Oidhreachta,  
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

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Department of Arts, Heritage,  
Regional, Rural and Gaeltacht Affairs



**National Parks and Wildlife Service,  
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs,  
7 Ely Place, Dublin 2, Ireland.  
Web: [www.npws.ie](http://www.npws.ie)  
E-mail: [nature.conservation@ahg.gov.ie](mailto:nature.conservation@ahg.gov.ie)**

**Citation:**

**NPWS (2017) Conservation Objectives: River Finn SAC 002301. Version 1.  
National Parks and Wildlife Service, Department of Arts, Heritage, Regional,  
Rural and Gaeltacht Affairs.**

**Series Editor: Rebecca Jeffrey  
ISSN 2009-4086**

## Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

### Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.



## Qualifying Interests

\* indicates a priority habitat under the Habitats Directive

002301 River Finn SAC

1106	Salmon <i>Salmo salar</i>
1355	Otter <i>Lutra lutra</i>
3110	Oligotrophic waters containing very few minerals of sandy plains ( <i>Littorelletalia uniflorae</i> )
4010	Northern Atlantic wet heaths with <i>Calluna vulgaris</i> (or <i>Calluna vulgaris</i> )
7130	Blanket bogs (* if active bog)
7140	Transition mires and quaking bogs

Please note that this SAC overlaps with Derryveagh and Glendowan Mountains SPA (004039) and Lough Derg (Donegal) SPA (004057) and adjoins Meentygrannagh Bog SAC (000173), Dunragh Loughs/Pettigo Plateau SAC (001125) and Cloghernagore Bog and Glenveagh National Park SAC (002047). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjoining sites as appropriate.

## Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: [www.npws.ie/Publications](http://www.npws.ie/Publications)

### NPWS Documents

<b>Year :</b>	1990
<b>Title :</b>	A survey to locate lowland blanket bogs of scientific interest in county Donegal and upland blanket bogs in counties Cavan, Leitrim and Roscommon
<b>Author :</b>	Douglas, C.; Dunnells, D.; Scally, L.; Wyse Jackson, M.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2006
<b>Title :</b>	Otter survey of Ireland 2004/2005
<b>Author :</b>	Bailey, M.; Rochford, J.
<b>Series :</b>	Irish Wildlife Manual No. 23
<b>Year :</b>	2007
<b>Title :</b>	Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents. Article 17 forms and supporting maps
<b>Author :</b>	NPWS
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2012
<b>Title :</b>	Ireland Red List No. 8: Bryophytes
<b>Author :</b>	Lockhart, N.; Hodgetts, N.; Holyoak, D.
<b>Series :</b>	Ireland Red List series, NPWS
<b>Year :</b>	2013
<b>Title :</b>	National otter survey of Ireland 2010/12
<b>Author :</b>	Reid, N.; Hayden, B.; Lundy, M.G.; Pietravallo, S.; McDonald, R.A.; Montgomery, W.I.
<b>Series :</b>	Irish Wildlife Manual No. 76
<b>Year :</b>	2013
<b>Title :</b>	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
<b>Author :</b>	NPWS
<b>Series :</b>	Conservation assessments
<b>Year :</b>	2014
<b>Title :</b>	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
<b>Author :</b>	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
<b>Series :</b>	Irish Wildlife Manual No. 79
<b>Year :</b>	2015
<b>Title :</b>	Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting
<b>Author :</b>	O Connor, Á.
<b>Series :</b>	Unpublished document by NPWS
<b>Year :</b>	2016
<b>Title :</b>	Ireland Red List No. 10: Vascular Plants
<b>Author :</b>	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
<b>Series :</b>	Ireland Red Lists series, NPWS
<b>Year :</b>	2017
<b>Title :</b>	River Finn SAC (site code: 2301) Conservation objectives supporting document- blanket bog and associated habitats V1
<b>Author :</b>	NPWS
<b>Series :</b>	Conservation objectives supporting document

## Other References

<b>Year :</b>	1934
<b>Title :</b>	The Botanist in Ireland
<b>Author :</b>	Praeger, R.L.
<b>Series :</b>	Hodges, Figgis and Co., Dublin
<b>Year :</b>	1982
<b>Title :</b>	Otter survey of Ireland
<b>Author :</b>	Chapman, P.J.; Chapman, L.L.
<b>Series :</b>	Unpublished report to Vincent Wildlife Trust
<b>Year :</b>	1982
<b>Title :</b>	Eutrophication of waters. Monitoring assessment and control
<b>Author :</b>	OECD
<b>Series :</b>	OECD, Paris
<b>Year :</b>	1991
<b>Title :</b>	The spatial organization of otters ( <i>Lutra lutra</i> ) in Shetland
<b>Author :</b>	Kruuk, H.; Moorhouse, A.
<b>Series :</b>	Journal of Zoology, 224: 41-57
<b>Year :</b>	2000
<b>Title :</b>	Colour in Irish lakes
<b>Author :</b>	Free, G.; Allott, N.; Mills, P.; Kennelly, C.; Day, S.
<b>Series :</b>	Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie, 27: 2620-2623
<b>Year :</b>	2002
<b>Title :</b>	Deterioration of Atlantic soft water macrophyte communities by acidification, eutrophication and alkalisation
<b>Author :</b>	Arts, G.H.P.
<b>Series :</b>	Aquatic Botany, 73: 373-393
<b>Year :</b>	2006
<b>Title :</b>	Otters - ecology, behaviour and conservation
<b>Author :</b>	Kruuk, H.
<b>Series :</b>	Oxford University Press
<b>Year :</b>	2006
<b>Title :</b>	A reference-based typology and ecological assessment system for Irish lakes. Preliminary investigations. Final report. Project 2000-FS-1-M1 Ecological assessment of lakes pilot study to establish monitoring methodologies EU (WFD)
<b>Author :</b>	Free, G.; Little, R.; Tierney, D.; Donnelly, K.; Coroni, R.
<b>Series :</b>	EPA, Wexford
<b>Year :</b>	2008
<b>Title :</b>	Water Quality in Ireland 2004-2006
<b>Author :</b>	Clabby, K.J.; Bradley, C.; Craig, M.; Daly, D.; Lucey, J.; McGarrigle, M.; O'Boyle, S.; Tierney, D.; Bowman, J.
<b>Series :</b>	EPA, Wexford
<b>Year :</b>	2009
<b>Title :</b>	The identification, characterization and conservation value of isoetid lakes in Ireland
<b>Author :</b>	Free, G.; Bowman, J.; McGarrigle, M.; Little, R.; Coroni, R.; Donnelly, K.; Tierney, D.; Trodd, W.
<b>Series :</b>	Aquatic Conservation: Marine and Freshwater Ecosystems, 19 (3): 264-273

<b>Year :</b>	2010
<b>Title :</b>	Otter tracking study of Roaringwater Bay
<b>Author :</b>	De Jongh, A.; O'Neill, L.
<b>Series :</b>	Unpublished draft report to NPWS
<b>Year :</b>	2010
<b>Title :</b>	Water quality in Ireland 2007-2009
<b>Author :</b>	McGarrigle, M.; Lucey, J.; Ó Cinnéide, M.
<b>Series :</b>	EPA, Wexford
<b>Year :</b>	2015
<b>Title :</b>	Water quality in Ireland 2010-2012
<b>Author :</b>	Bradley, C.; Byrne, C.; Craig, M.; Free, G.; Gallagher, T.; Kennedy, B.; Little, R.; Lucey, J.; Mannix, A.; McCreesh, P.; McDermott, G.; McGarrigle, M.; Ní Longphuirt, S.; O'Boyle, S.; Plant, C.; Tierney, D.; Trodd, W.; Webster, P.; Wilkes, R.; Wynne, C.
<b>Series :</b>	EPA, Wexford
<b>Year :</b>	2016
<b>Title :</b>	The Status of Irish Salmon Stocks in 2015 with Precautionary Catch Advice for 2016
<b>Author :</b>	SSCS (Standing Scientific Committee on Salmon)
<b>Series :</b>	Independent Scientific Report to Inland Fisheries Ireland

## Spatial data sources

<b>Year :</b>	2008
<b>Title :</b>	OSi 1:5000 IG vector dataset
<b>GIS Operations :</b>	WaterPolygons feature class clipped to the SAC boundary. Expert opinion used to identify Annex I habitat and to resolve any issues arising
<b>Used For :</b>	3110 (map 3)
<b>Year :</b>	2010
<b>Title :</b>	OSi 1:5000 IG vector dataset
<b>GIS Operations :</b>	Creation of 80m buffer on the aquatic side of lake data; creation of 10m buffer on the terrestrial side of lake data. These datasets combined with the derived OSi Discovery Series river and canal datasets. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising. Creation of 250m buffer on aquatic side of the lake boundary to highlight potential commuting points
<b>Used For :</b>	1355 (map 4)
<b>Year :</b>	2005
<b>Title :</b>	OSi Discovery series vector data
<b>GIS Operations :</b>	Creation of a 10m buffer on the terrestrial side of river banks data; creation of 20m buffer applied to canal centreline data. Creation of 20m buffer applied to river and stream centreline data; These datasets combined with the derived OSI 1:5000 vector lake buffer data. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
<b>Used For :</b>	1355 (no map)



## Conservation Objectives for : River Finn SAC [002301]

### 3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)

**To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in River Finn SAC, which is defined by the following list of attributes and targets:**

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Lake habitat 3110 is likely to occur in the larger lakes in River Finn SAC, such as Loughs Derg, Finn and Belshade. Lake habitat 3130 may also occur in Loughs Derg and Finn. The exact distribution of lake habitat 3110 in the SAC is unknown however, as little specific information on the lake vegetation is currently available. Lake habitat 3110 may co-occur with lake habitat 3160 in small and upland lakes. In line with Article 17 reporting (NPWS, 2013), all lakes larger than 1ha have been mapped as 'potential 3110' (see map 3). Two measures of extent should be used: 1. the area of the lake itself and; 2. the extent of the vegetation communities/zones that typify the habitat. Further information relating to all attributes is provided in the lake habitats supporting document for the purposes of site-specific conservation objectives and Article 17 reporting (O Connor, 2015)
Habitat distribution	Occurrence	No decline, subject to natural processes	As noted above, the exact distribution of lake habitat 3110 in River Finn SAC is not known. In map 3, all lakes larger than 1ha (based on 1:5,000 data) have been mapped as potential 3110
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution	For lists of typical plant species, see the Article 17 habitat assessment for lake habitat 3110 (NPWS, 2013) and the lake habitats supporting document (O Connor, 2015). The moss <i>Fontinalis antipyretica</i> , quillwort ( <i>Isoetes lacustris</i> ), bulbous rush ( <i>Juncus bulbosus</i> ), shoreweed ( <i>Littorella uniflora</i> ), water lobelia ( <i>Lobelia dortmanna</i> ), broad-leaved pondweed ( <i>Potamogeton natans</i> ) and floating bur-reed ( <i>Sparganium angustifolium</i> ) have been recorded in Lough Derg (Praeger, 1934; internal NPWS and EPA files). Environmental Protection Agency (EPA) biologists have also recorded slender naiad ( <i>Najas flexilis</i> ) in Lough Derg, suggesting lake habitat 3130 may occur. EPA records for stonewort ( <i>Chara</i> sp.), intermediate water starwort ( <i>Callitriche hamulata</i> ) and pondweeds ( <i>Potamogeton berchtoldii</i> , <i>P. gramineus</i> and <i>P. perfoliatus</i> ) in Lough Finn are also indicative of lake habitat 3130
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	Further work is necessary to describe the characteristic zonation and other spatial patterns in lake habitat 3110 (see O Connor, 2015)
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	The maximum depth of vegetation is likely to be specific to the lake shoreline in question. Further work is necessary to develop indicative targets for lake habitat 3110. Water clarity is expected to be high in upland 3110 lakes, resulting in a large maximum depth of vegetation
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat	Fluctuations in lake water level are typical in Ireland, but can be amplified by activities such as abstraction and drainage. Increased water level fluctuations can increase wave action, up-root vegetation, increase turbidity, alter the substratum and lead to release of nutrients from the sediment. The hydrological regime of the lakes must be maintained so that the area, distribution and depth of the lake habitat and its constituent/characteristic vegetation zones and communities are not reduced

Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Research is required to further characterise the substratum types (particle size and origin) and substratum quality (notably pH, calcium, iron and nutrient concentrations) favoured by each of the five Annex I lake habitats in Ireland. It is likely that lake habitat 3110 is associated with a range of nutrient-poor substrates, from stones, cobble and gravel, through sands, silt, clay and peat. Substratum particle size is likely to vary with depth and along the shoreline within a single lake
Water quality: transparency	Metres	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Transparency relates to light penetration and, hence, to the depth of colonisation of vegetation. It can be affected by phytoplankton blooms, water colour and turbidity. Specific targets have yet to be established for lake habitat 3110 (O Connor, 2015). Habitat 3110 is associated with very clear water, particularly upland examples. The OECD fixed boundary system set transparency targets for oligotrophic lakes of $\geq 6\text{m}$ annual mean Secchi disk depth, and $\geq 3\text{m}$ annual minimum Secchi disk depth. Free et al. (2009) found high isoetid abundance in lakes with Secchi depths of more than 3m
Water quality: nutrients	$\mu\text{g/l P}$ ; $\text{mg/l N}$	Maintain the concentration of nutrients in the water column at sufficiently low levels to support the habitat and its typical species	As a nutrient-poor habitat, oligotrophic and Water Framework Directive (WFD) 'high' status targets apply. Where a lake has nutrient concentrations that are lower than these targets, there should be no decline within class, i.e. no upward trend in nutrient concentrations. For lake habitat 3110, annual average total phosphorus (TP) concentration should be $\leq 10\mu\text{g/l TP}$ , average annual total ammonia concentration should be $\leq 0.040\text{mg/l N}$ and annual 95th percentile for total ammonia should be $\leq 0.090\text{mg/l N}$ . See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton biomass	$\mu\text{g/l Chlorophyll } a$	Maintain appropriate water quality to support the habitat, including high chlorophyll <i>a</i> status	Oligotrophic and WFD 'high' status targets apply to lake habitat 3110. Where a lake has a chlorophyll <i>a</i> concentration that is lower than this target, there should be no decline within class, i.e. no upward trend in phytoplankton biomass. The average growing season (March-October) chlorophyll <i>a</i> concentration must be $< 5.8\mu\text{g/l}$ . The annual average chlorophyll <i>a</i> concentration should be $< 2.5\mu\text{g/l}$ and the annual peak chlorophyll <i>a</i> concentration should be $\leq 8.0\mu\text{g/l}$ . See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	The EPA has developed a phytoplankton composition metric for nutrient enrichment of Irish lakes. As for other water quality indicators, lake habitat 3110 requires WFD high status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Maintain trace/absent attached algal biomass ( $< 5\%$ cover) and high phytobenthos status	Nutrient enrichment can favour epiphytic and epipelic algae that can out-compete the submerged vegetation. The cover abundance of attached algae in lake habitat 3110 should, therefore, be trace/absent ( $< 5\%$ cover). EPA phytobenthos can be used as an indicator of changes in attached algal biomass. As for other water quality indicators, lake habitat 3110 requires high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Maintain high macrophyte status	Nutrient enrichment can favour more competitive submerged macrophyte species that out-compete the typical and characteristic species for the lake habitat. The EPA monitors macrophyte status for WFD purposes using the 'Free Index'. The target for lake habitat 3110 is high status or an Ecological Quality Ratio (EQR) for lake macrophytes of $\geq 0.90$ , as defined in Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009

Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	Acidification can impact on species abundance and composition in soft water lake habitats. In Europe, acidification of isoetid lakes can lead to loss of isoetids and dominance by submerged <i>Sphagnum</i> mosses and <i>Juncus bulbosus</i> (Arts, 2002). The specific requirements of lake habitat 3110, in terms of water and sediment pH, alkalinity and cation concentration, have not been determined. For lake habitat 3110, and adopting a precautionary approach based on Arts (2002), minimum pH should not be <5.5 pH units. Maximum pH should be <9.0 pH units, in line with the surface water standards established for soft waters (where water hardness is ≤100mg/l calcium carbonate). See Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water colour	mg/l PtCo	Maintain appropriate water colour to support the habitat	Increased water colour and turbidity decrease light penetration and can reduce the area of available habitat for lake macrophytes, particularly at the lower euphotic depths. The primary source of increased water colour in Ireland is disturbance to peatland. No habitat-specific or national standards for water colour currently exist. Studies have shown median colour concentrations in Irish lakes of 38mg/l PtCo (Free et al., 2000) and 33mg/l PtCo (Free et al., 2006). It is likely that the water colour in all Irish lake habitats would naturally be <50mg/l PtCo. Water colour can be very low (<20mg/l PtCo or even <10mg/l PtCo) in lake habitat 3110, where the peatland in the lake's catchment is intact
Dissolved organic carbon (DOC)	mg/l	Maintain appropriate organic carbon levels to support the habitat	Dissolved (and particulate) organic carbon (OC) in the water column is linked to water colour and acidification (organic acids). Increasing DOC in water has been documented across the Northern Hemisphere, including afforested peatland catchments in Ireland. Damage and degradation of peatland, leading to decomposition of peat is likely to be the predominant source of OC in Ireland. OC in water promotes decomposition by fungi and bacteria that, in turn, releases dissolved nutrients. The increased biomass of decomposers can also impact directly on the characteristic lake communities through shading, competition, etc.
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat	Turbidity can significantly affect the quantity and quality of light reaching rooted and attached vegetation and can, therefore, impact on lake habitats. The settlement of higher loads of inorganic or organic material on lake vegetation communities may also have impacts on sensitive, delicate species. Turbidity can increase as a result of re-suspension of material within the lake, higher loads entering the lake, or eutrophication. Turbidity measurement and interpretation is challenging. As a result, it is likely to be difficult to set habitat-specific targets for turbidity in lakes
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110	Most lake shorelines have fringing habitats of reedswamp, other swamp, fen, marsh or wet woodland that intergrade with and support the structure and functions of the lake habitat. In River Finn SAC, active blanket bog and heath, transition mire, fen, flush or grassland could also occur. Equally, fringing habitats are dependent on the lake, particularly its water levels, and support wetland communities and species of conservation concern. Many of the fringing wetland habitats support higher invertebrate and plant species richness than the lake habitats themselves

## Conservation Objectives for : River Finn SAC [002301]

### 4010 Northern Atlantic wet heaths with *Erica tetralix*

**To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in River Finn SAC, which is defined by the following list of attributes and targets:**

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Northern Atlantic wet heaths with <i>Erica tetralix</i> has not been mapped in detail for River Finn SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 187ha, covering 3% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the River Finn SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	Wet heath occurs in association with blanket bog, upland grassland and exposed rock within the SAC. It occupies shallower peats and better drained slopes. It occurs quite widely at Owendoo/ Cloghervaddy (Douglas et al., 1990; NPWS internal files). Further information can be found within Douglas et al. (1990), NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	A variety of wet heath vegetation communities have been recorded in this SAC (Douglas et al., 1990; NPWS internal files), three of which correspond to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of monitoring stops	Cross-leaved heath ( <i>Erica tetralix</i> ) present within a 20m radius of each monitoring stop	Attribute and target based on Perrin et al. (2014)
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of <i>Cladonia</i> and <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry ( <i>Empetrum nigrum</i> ) at least 15%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented

Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). The non-native moss <i>Campylopus introflexus</i> has been recorded from the SAC (Douglas et al., 1990), but this species cannot be assigned specifically to wet heath
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken ( <i>Pteridium aquilinum</i> ) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush ( <i>Juncus effusus</i> ) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: <i>Sphagnum</i> condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the <i>Sphagnum</i> cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry ( <i>Empetrum nigrum</i> ) and bog-myrtle ( <i>Myrica gale</i> ) showing signs of browsing	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014)
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 (FPO) and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016). There is a historic record for the FPO listed and Vulnerable marsh clubmoss ( <i>Lycopodiella inundata</i> ) (Wyse Jackson et al., 2016) from Lough Belshade in the SAC (NPWS internal files), but this species cannot be assigned specifically to wet heath



## Conservation Objectives for : River Finn SAC [002301]

### 7130 Blanket bogs (\* if active bog)

**To restore the favourable conservation condition of Blanket bogs (\*if active bog) in River Finn SAC, which is defined by the following list of attributes and targets:**

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Blanket bog has not been mapped in detail for River Finn SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 519ha, covering 9% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the River Finn SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	Blanket bog is documented to occur throughout much of the upland areas of the SAC and along the edges of the river. The most extensive examples are found at Tullytresna and Owendoo/Cloghervaddy. A valley bog is present to the north-east of Lough Finn (Douglas et al., 1990; NPWS internal files). Further information can be found within Douglas et al. (1990), NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog habitat	At least 99% of the total Annex I blanket bog area is active	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: hydrology	Flow direction, water levels, occurrence of drains and erosion gullies	Natural hydrology unaffected by drains and erosion	Further details and a brief discussion of restoration potential is presented in the blanket bogs and associated habitats supporting document
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	A variety of blanket bog vegetation communities have been recorded in this SAC (Douglas et al., 1990; NPWS internal files), four of which correspond to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least seven	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding <i>Sphagnum fallax</i> , at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%	Attribute and target based on Perrin et al. (2014). See the blanket bogs and associated habitats supporting document for the list of potential dominant species
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). The non-native moss <i>Campylopus introflexus</i> has been recorded from the SAC (Douglas et al., 1990), but this species cannot be assigned specifically to blanket bog

Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: <i>Sphagnum</i> condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the <i>Sphagnum</i> cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry ( <i>Empetrum nigrum</i> ) and bog-myrtle ( <i>Myrica gale</i> ) showing signs of browsing collectively less than 33%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 (FPO) and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016). There is a historic record for the FPO listed and Vulnerable marsh clubmoss ( <i>Lycopodiella inundata</i> ) (Wyse Jackson et al., 2016) from Lough Belshade in the SAC (NPWS internal files), but this species cannot be assigned specifically to blanket bog

## Conservation Objectives for : River Finn SAC [002301]

### 7140 Transition mires and quaking bogs

**To restore the favourable conservation condition of Transition mires and quaking bogs in River Finn SAC, which is defined by the following list of attributes and targets:**

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Transition mires and quaking bogs have not been mapped in detail for River Finn SAC and thus total area of the qualifying habitat is unknown. Further details on this and the following attributes can be found in the River Finn SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	The habitat occurs at the interface between bog and waterbodies. An extensive area of this habitat is found at Owendoo/Cloghervaddy to the west of the Owendoo River. It is also thought to occur in quaking areas associated with Cronakerny and Cronamuck. Other locations that support this habitat include Tullytresna and the lake edges of Lough Fad, Lough Finn, Lough Gulladuff and the small lakes south of Lough Belshade (Douglas et al., 1990; NPWS internal files). Further information can be found within Douglas et al. (1990), NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	A variety of transition mire vegetation communities have been recorded in this SAC (NPWS internal files), two of which correspond to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: number of positive indicator species	Vegetation composition: number of positive indicator species	Number of positive indicator species at each monitoring stop is at least three for infilling pools and flushes and at least six for fens	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: number of core positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	At least one core positive indicator species present	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of positive indicator species is at least 25%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014)

Vegetation structure: height	Percentage of leaves/shoots at a representative number of 2m x 2m monitoring stops	Proportion of live leaves and/or flowering shoots of vascular plants that are more than 15cm above the ground surface should be at least 50%	Attribute and target based on Perrin et al. (2014). This attribute is only applicable to fen and flush examples of the habitat, not to infilling pool examples
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)

**Conservation Objectives for : River Finn SAC [002301]****1106 Salmon *Salmo salar***

**To maintain the favourable conservation condition of Atlantic Salmon in River Finn SAC, which is defined by the following list of attributes and targets:**

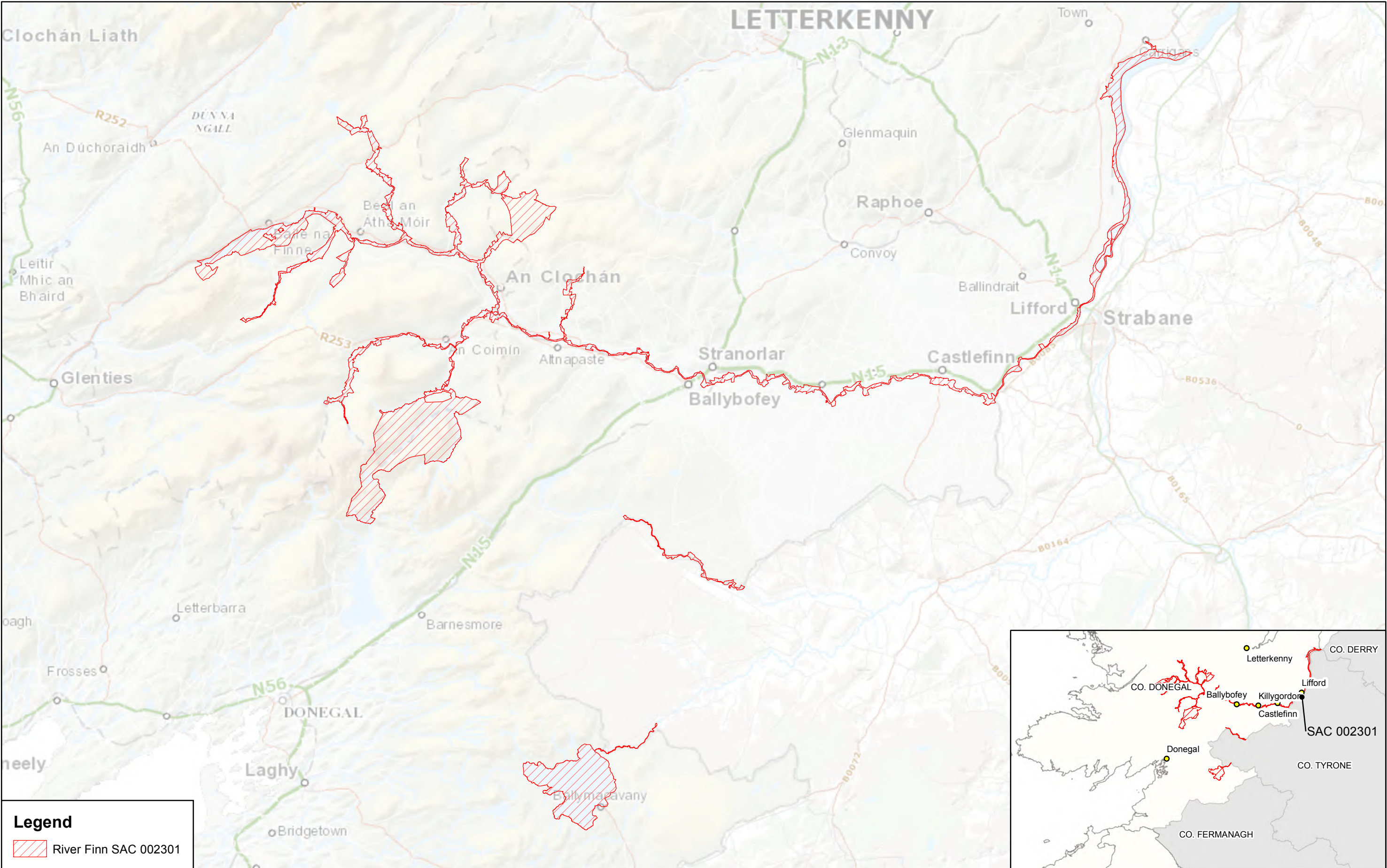
Attribute	Measure	Target	Notes
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary	Artificial barriers block salmon's upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas
Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded	A conservation limit (CL) is defined by the North Atlantic Salmon Conservation Organisation (NASCO) as "the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship". The target is based on the Standing Scientific Committee on Salmon (SSCS) annual model output of CL attainment levels. See SSCS (2016). Attainment of CL estimates are derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	The target is the threshold value for rivers currently exceeding their conservation limit (CL)
Out-migrating smolt abundance	Number	No significant decline	Smolt abundance can be negatively affected by a number of impacts such as estuarine pollution, predation and sea lice ( <i>Lepeophtheirus salmonis</i> )
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	Salmon spawn in clean gravels
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	Q values based on triennial water quality surveys carried out by the Environmental Protection Agency (EPA)




**Conservation Objectives for : River Finn SAC [002301]****1355 Otter *Lutra lutra***


**To maintain the favourable conservation condition of Otter in River Finn SAC, which is defined by the following list of attributes and targets:**

<b>Attribute</b>	<b>Measure</b>	<b>Target</b>	<b>Notes</b>
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. Favourable Conservation Status (FCS) target, based on 1980/81 survey findings, is 88% in SACs. Current range is estimated at 93.6% (Reid et al., 2013)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 390ha along river banks/lake shoreline/ around ponds	No field survey. Areas mapped to include 10m terrestrial buffer along river banks and around water bodies identified as critical for otters (NPWS, 2007)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 182.2km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 354ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk and Moorhouse, 1991; Kruuk, 2006)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006; Reid et al., 2013)
Barriers to connectivity	Number	No significant increase. For guidance, see map 4	Otters will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed



**Legend**

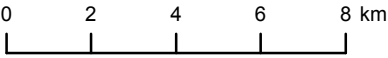
 River Finn SAC 002301

 An Roinn Ealaíon, Oidhreacht, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta  
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

**MAP 1:  
RIVER FINN SAC  
CONSERVATION OBJECTIVES  
SAC DESIGNATION**

Map to be read in conjunction with the NPWS Conservation Objectives Document.

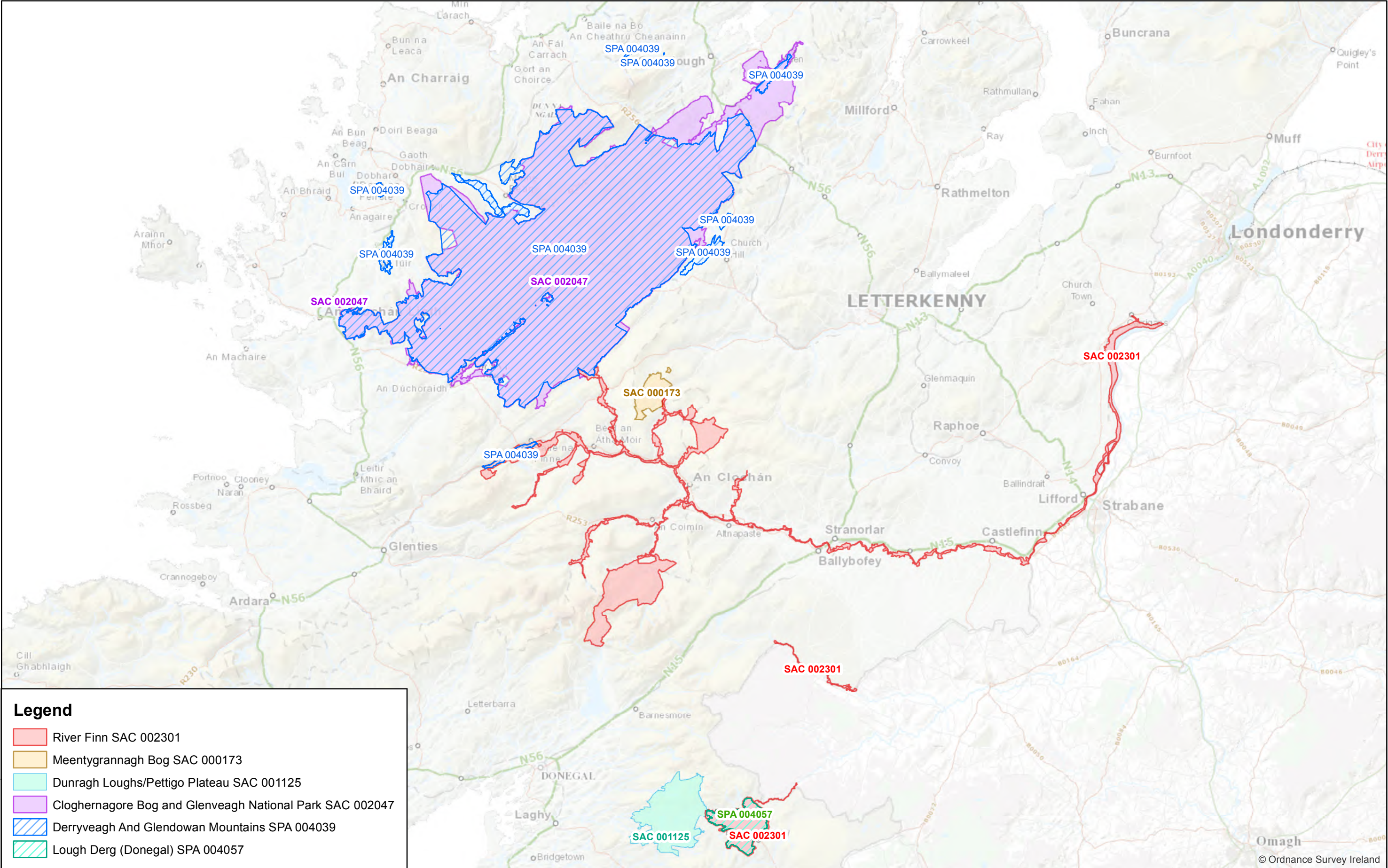
**SITE CODE:  
SAC 002301; version 3.01  
CO. DONEGAL**



The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.  
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas

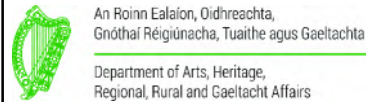
  
**Map Version 1  
Date: May 2017**





**Legend**

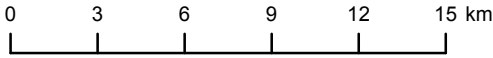
- River Finn SAC 002301
- Meentygrannagh Bog SAC 000173
- Dunragh Loughs/Pettigo Plateau SAC 001125
- Cloghernagore Bog and Glenveagh National Park SAC 002047
- Derryveagh And Glendowan Mountains SPA 004039
- Lough Derg (Donegal) SPA 004057



**MAP 2:  
RIVER FINN SAC  
CONSERVATION OBJECTIVES  
ADJACENT / ADJOINING AND  
OVERLAPPING DESIGNATIONS**

Map to be read in conjunction with the NPWS Conservation Objectives Document.

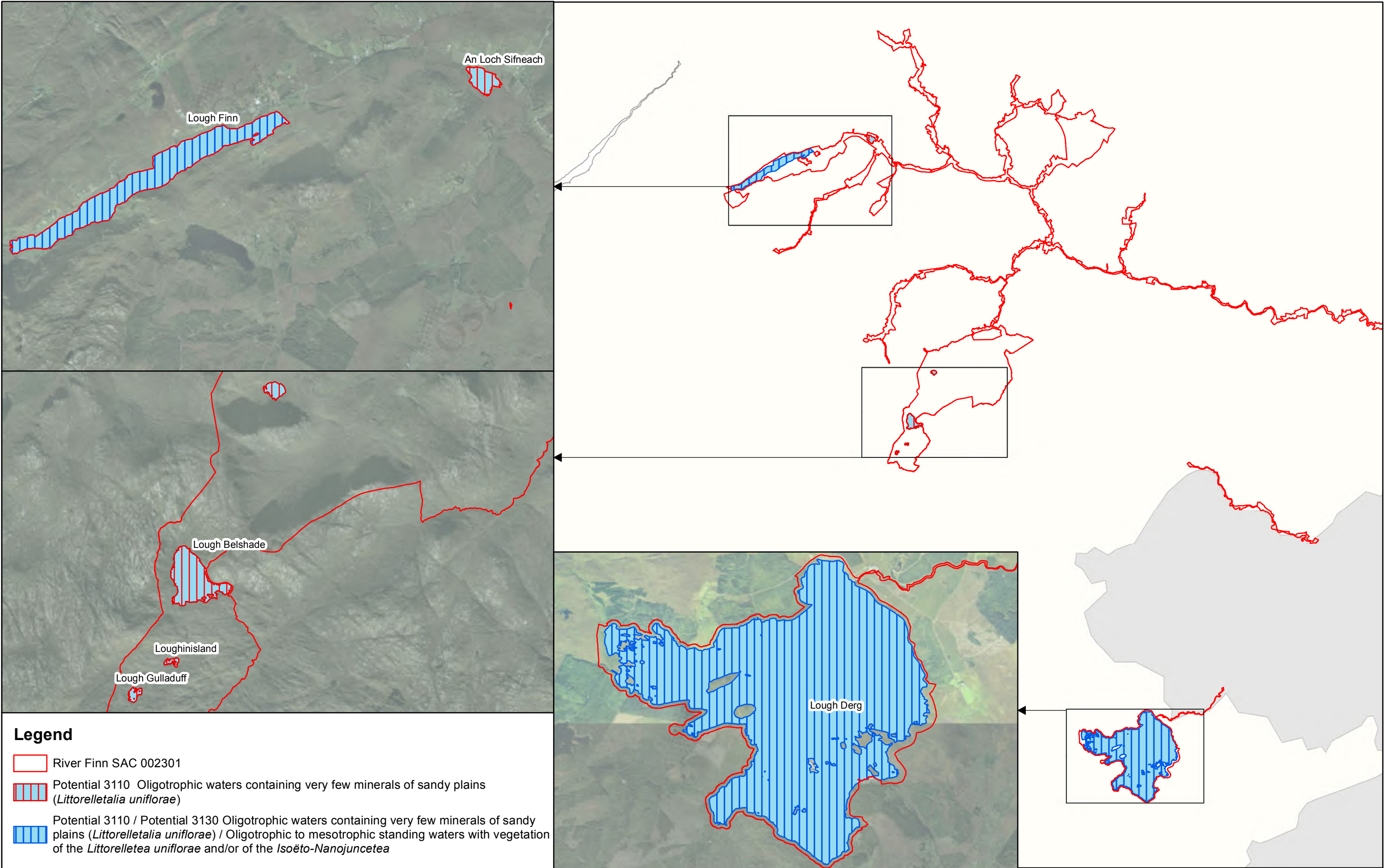
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**SAC 002047; version 3. SAC 001125; version 3.**  
**SPA 004039; version 3. SAC 004057; version 3.**  
**CO. DONEGAL**

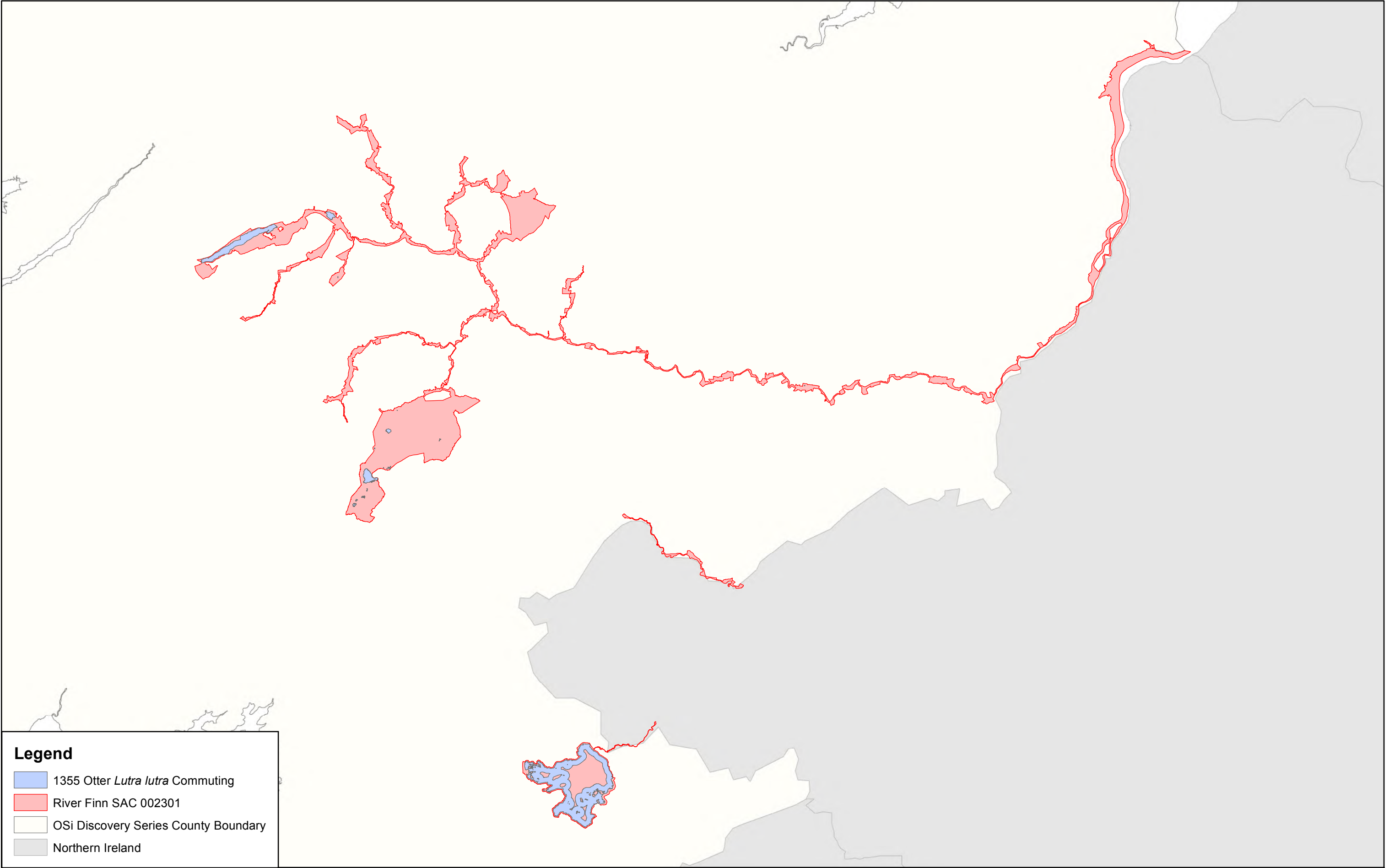


The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.  
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**Legend**

- 1355 Otter *Lutra lutra* Commuting
- River Finn SAC 002301
- OSi Discovery Series County Boundary
- Northern Ireland

 An Roinn Ealaíon, Oidhreacht, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta  
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

**MAP 4:  
RIVER FINN SAC  
CONSERVATION OBJECTIVES  
OTTER COMMUTING**

Map to be read in conjunction with the NPWS Conservation Objectives Document.

**SITE CODE:  
SAC 002301; version 3.01  
CO. DONEGAL**

0 1.5 3 4.5 6 7.5 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.  
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**Map Version 1  
Date: May 2017**



**River Finn SAC (site code 002301)**  
**Conservation objectives supporting document**  
**- blanket bogs and associated habitats**

**NPWS**

**Version 1**

**May 2017**

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## 1 Introduction

Achieving Favourable Conservation Status (FCS) is the overall objective to be reached for all Annex I habitat types and Annex II species of European Community interest listed in the EU Habitats Directive 92/43/EEC. It is defined in positive terms such that a habitat type or species must be prospering and have good prospects of continuing to do so.

Almost 19% of Ireland can be considered to support upland habitats (Perrin *et al.*, 2009). The importance of these areas for biodiversity conservation is unquestionable, with numerous upland habitat types listed under Annex I of the EU Habitats Directive and many rare and threatened bird and other animal species being associated with these habitats. This is reflected in the fact that over 40% of the total terrestrial area currently selected for designation as Special Areas of Conservation (SAC) in Ireland lies above 150m in altitude.

The Scoping Study and Pilot Survey of Upland Habitats (Perrin *et al.*, 2009) was commissioned by the National Parks and Wildlife Service (NPWS) with the primary remit of devising an appropriate strategy and methodologies for conducting a National Survey of Upland Habitats (NSUH). Four phases of the NSUH have since been completed between 2010 and 2014. The principle aims of the NSUH are to map all habitats within a site and to assess the conservation condition of the relevant Annex I habitats, listed in Table 1 below.

The conservation objectives attributes and targets, which are based on the monitoring criteria developed by the NSUH, have been applied to the Annex I habitats listed as Qualifying Interests for River Finn SAC (see Table 1 and Section 2).

Individual blanket bog sites within River Finn SAC were surveyed by Douglas *et al.* (1990) as part of a wider blanket bog survey project across Ireland carried out by NPWS between 1987 and 1991 (see Conaghan, 2000).

**Table 1:** Annex I habitats that occur in Irish uplands and which are primary focus habitats for the NSUH. Habitats in bold are those that are listed as Qualifying Interests for River Finn SAC.

Habitat code	Habitat name
<b>4010</b>	<b>Northern Atlantic wet heaths with <i>Erica tetralix</i></b>
4030	European dry heaths
4060	Alpine and Boreal heaths
6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)*
<b>7130</b>	<b>Blanket bogs (*if active bog)</b>
<b>7140</b>	<b>Transition mires and quaking bogs</b>
7150	Depressions on peat substrates of the Rhynchosporion
7230	Alkaline fens
8110	Siliceous screes of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> )
8120	Calcareous and calcshist screes of the montane to alpine levels ( <i>Thlaspietalia rotundifoliae</i> )
8210	Calcareous rocky slopes with chasmophytic vegetation
8220	Siliceous rocky slopes with chasmophytic vegetation

\* Denotes a priority habitat under the EU Habitats Directive

## **1.1 River Finn SAC**

River Finn SAC is 5,502ha in extent. The SAC comprises almost the entire length of the River Finn in Co. Donegal and includes its tributaries. It also includes Lough Finn (where the river rises), the spawning grounds at the headwaters of the Mourne and Derg Rivers, Lough Derg, Lough Belshade and the tidal stretch of the River Foyle to the north of Lifford (O.S. Discovery Series map 6, 7, 11 and 12). The River Finn passes through a number of towns including Lifford, Castlefinn, Stranolar and Ballybofey. Geologically the SAC is primarily underlain by Dalradian schists and gneiss, though quartzites and carboniferous limestones are present in the vicinity of Castlefinn. The hills around Lough Finn are also on quartzite. The mountains of Owendoo and Cloghervaddy are composed of granite felsite and other intrusive rocks rich in silica (NPWS internal files).

## **1.2 Mapping methodology**

A detailed habitat mapping survey of River Finn SAC, utilising the methodology presented in Perrin *et al.* (2014), has not been conducted. Therefore, the data currently available are not sufficient to facilitate the production of an accurate habitat map.

All current relevant datasets for Annex I habitats were summarised within the GIS files associated with NPWS (2013) and these were utilised to calculate an approximate area for 4010 Wet heaths and 7130 Blanket bogs (\* if active bog) in River Finn SAC. There were no data with which to estimate the approximate areas of 7140 Transition mires in the SAC.

## **1.3 Potential for habitat restoration**

Restoration management for 7130 Blanket bogs (\* if active bog) in this SAC is required, as the conservation objective for the habitat is to restore favourable conservation condition here. Areas that might be restored to active blanket bog could include inactive bog, bare eroding bog and recent cutover bog, and also areas of drained deep peat or older cutovers which currently support other types of vegetation such as heath. These latter areas may be classified as other Annex I habitats (e.g. 4010). Restoration of priority 7130 habitat may therefore result in loss in the area and distribution of other Annex I habitats that are Qualifying Interests. If such scenarios are identified by restoration management plans, the conservation objectives for these other Qualifying Interests should be adjusted accordingly.

## **2 Conservation objectives**

A site-specific conservation objective aims to define the favourable conservation condition of a habitat or species at site level. The maintenance of habitats and species within sites at favourable condition will contribute to the maintenance of favourable conservation status (FCS) of those habitats and species at a national level.

Conservation objectives are defined using attributes and targets that are based on parameters as set out in the Habitats Directive for defining favourable status, namely area, range, and structure and functions.

The *Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland* (Perrin *et al.*, 2014) have been used as a basis for setting most of the site-specific

attributes and targets for uplands habitats. However, attributes and targets may change/become more refined as further information becomes available.

As no recent detailed survey has been undertaken to assess the area or the structure and functions of 4010 Wet heaths, 7130 Blanket bogs (\* if active bog) and 7140 Transition mires in River Finn SAC, the National Conservation Assessment (NCA) for each Annex I habitat (NPWS, 2013) was instead utilised to indicate condition of the habitats in the SAC. If area and structure and functions were both assessed as “Favourable”, the objective for that habitat is to maintain favourable conservation condition. If either parameter was assessed as “Unfavourable – Inadequate” or “Unfavourable – Bad”, the objective for that habitat is to restore favourable conservation condition. The NCA for 4010 Wet heaths was Unfavourable – Inadequate for area and Unfavourable – Bad for structure and functions. The NCA for 7130 Blanket bogs (\* if active bog) was Unfavourable – Bad for both area and structure and functions. The NCA for 7140 Transition mires was Unfavourable – Inadequate for area and Unfavourable – Bad for structure and functions.

This document provides supporting information for the attributes of the conservation objectives for 4010 Wet heaths, 7130 Blanket bogs (\* if active bog) and 7140 Transition mires, given in the main conservation objectives document for River Finn SAC. The two documents should be read in conjunction with each other.

The conservation objective for each of the Annex I habitats dealt with in this supporting document are as follows:

- To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in River Finn SAC.
- To restore the favourable conservation condition of Blanket bogs (\* if active bog) in River Finn SAC.
- To restore the favourable conservation condition of Transition mires and quaking bogs in River Finn SAC.

### 3 Area

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. The target is for the habitat area to be stable or increasing. Approximate baseline figures are presented in Table 2 for 4010 Wet heaths and 7130 Blanket bogs (\* if active bog) in River Finn SAC. There were no data with which to estimate the approximate areas of 7140 Transition mires in the SAC.

**Table 2:** Estimated extent of blanket bog and associated Annex I habitats that are listed as Qualifying Interests for River Finn SAC. \*denotes priority habitat.

Annex I code	Habitat	Approximate area (ha)	% of SAC
4010	Wet heaths	187	3
7130	Blanket bogs (* if active bog)	519	9
7140	Transition mires	Unknown	Unknown

As mentioned earlier, the area of habitat 7130 comprises active and inactive blanket bogs. The most frequent example of the latter encountered in the NSUH is described in Perrin *et al.* (2014) as a monospecific sward of common cottongrass (*Eriophorum angustifolium*) on eroded bog where a



reasonable depth of peat remains. Note, however, that where examples of this community occur on re-deposited, eroded peat, these areas will not have the structural, hydrological or functional characteristics of naturally formed blanket bog.

#### **4 Range**

Each habitat's range at site level, in the form of habitat distribution, has not been recorded in detail as no comprehensive mapping of the SAC has been undertaken. However, it is documented that 4010 Wet heaths occur in association with blanket bog, upland grassland and exposed rock within the SAC. This habitat occupies shallower peats and better drained slopes. It is known to occur quite widely at Owendoo/Cloghervaddy (Douglas *et al.*, 1990; NPWS internal files). 7130 Blanket bogs (\* if active bog) occur throughout much of the upland areas of the SAC and along the edges of the river. The most extensive examples are found at Tullytresna and Owendoo/Cloghervaddy. A valley bog is present to the north-east of Lough Finn (Douglas *et al.*, 1990; NPWS internal files). 7140 Transition mires are documented to occur at the interface between bog and waterbodies. An extensive area of this habitat is found at Owendoo/Cloghervaddy to the west of the Owendoo River. It is also known to occur in the quaking areas associated with Cronakerny and Cronamuck. Other locations that support this habitat include Tullytresna and the lake edges of Lough Fad, Lough Finn, Lough Gulladuff and the small lakes south of Lough Belshade (Douglas *et al.*, 1990; NPWS internal files). The target is that there should be no decline.

#### **5 Structure and functions**

Structure and functions relates to the physical components of a habitat ("structure") and the ecological processes that drive it ("functions"). For blanket bogs and associated habitats, these include a range of aspects such as soil chemistry, vegetation composition, hydrological regime, community diversity, habitat quality, species occurrence, indicators of local distinctiveness, disturbed ground, evidence of burning and negative species occurrence. These structure and functions are expanded on in the sections below.

At River Finn SAC, the structure and functions of 4010 Wet heaths, 7130 Blanket bogs (\* if active bog) and 7140 Transition mires have not been assessed in the field as there has been no recent detailed habitat survey.

##### **5.1 Ecosystem function**

Ecosystem function is assessed primarily through consideration of soil nutrient levels. For 7130 Blanket bogs (\* if active bog), additional consideration is given to peat formation and hydrology.

##### **5.1.1 Ecosystem function: soil nutrients**

An attribute to assess the soil nutrients is common to each of the habitats with a view to maintain the soil nutrient status within the natural range suited to the habitat. Relevant nutrients and natural ranges have yet to be defined. Nitrogen deposition and associated acidification are noted as being relevant to blanket bogs and all associated habitats in NPWS (2013). The target for each habitat is to maintain the soil nutrients status within the natural range.

### **5.1.2 Ecosystem function: peat formation**

Ecosystem function of 7130 Blanket bogs (\* if active bog) is further assessed through peat formation. Perrin *et al.* (2014) established an overriding assessment of blanket bog structure and functions based on the proportion of degraded bog within a site which includes eroding bog and cutover bog which would previously have been this Annex I habitat. If more than 1% of the combined area of active bog (Annex I habitat 7130\*), inactive bog (Annex I habitat 7130), eroded bog (habitat category PB5 – Fossitt, 2000) and recently cutover bog (habitat PB4 – Fossitt, 2000) is inactive, eroded or cutover then it should be assessed as Unfavourable – Inadequate, even if the results of the monitoring stops data are more positive. If more than 5% of the combined area is inactive, eroded or cutover it is assessed as Unfavourable – Bad.

The EU habitats interpretation manual (European Commission, 2013) defines active blanket bog as “still supporting a significant area of vegetation that is normally peat-forming”. For the purposes of defining favourable conservation condition of the Annex I habitat, the target is that at least 99% of the total Annex I blanket bog area is active bog.

### **5.1.3 Ecosystem function: hydrology**

Ecosystem function of 7130 Blanket bogs (\* if active bog) is further assessed through assessment of hydrology. Drains (cut for purposes of peat cutting, afforestation, etc.) and erosion gullies impact on the hydrology of blanket bog in the local vicinity. The target is for the natural hydrology to be unaffected by drains and erosion gullies. The process of restoring hydrological integrity may impact areas of heath habitats as discussed in Section 1.3.

## **5.2 Community diversity**

A variety of wet heath vegetation communities have been recorded from River Finn SAC (Douglas *et al.*, 1990; NPWS internal files). Three of the vegetation communities correspond to NSUH provisional communities, as described in the NSUH manual (Perrin *et al.*, 2014). These comprise WH3 *Calluna vulgaris* – *Molinia caerulea* – *Sphagnum capillifolium* wet/damp heath, WH4 *Trichophorum germanicum* – *Eriophorum angustifolium* wet heath and WH5 *Trichophorum germanicum* – *Nardus stricta* – *Racomitrium lanuginosum* montane wet heath. A variety of blanket bog species and vegetation communities have also been recorded from this SAC (Douglas *et al.*, 1990; NPWS internal files). Four of the vegetation communities correspond to NSUH provisional communities. These comprise BB1 *Schoenus nigricans* – *Eriophorum angustifolium* bog, BB4 *Trichophorum germanicum* – *Eriophorum angustifolium* bog, BB5 *Calluna vulgaris* – *Eriophorum* spp. bog and BB7 *Eriophorum angustifolium* – *Sphagnum austinii* bog. A variety of transition mire vegetation communities have been recorded in this SAC (Douglas *et al.*, 1990; NPWS internal files). Two of these correspond to NSUH provisional communities. These comprise PO1a *Menyanthes trifoliata* – *Carex limosa* infilling pool sub-community and PFLU5 *Carex rostrata* – *Sphagnum* spp. flush.

The target for the SAC is to maintain the variety of vegetation communities within 4010 Wet heaths, 7130 Blanket bogs (\* if active bog) and 7140 Transition mires, subject to natural processes.

### 5.3 Vegetation composition

Vegetation composition is assessed through a range of attributes tailored to each of the habitats. In general terms, they establish minimum thresholds for the occurrence or cover of desirable species and maximum thresholds for undesirable species.

#### 5.3.1 *Vegetation composition: positive indicator species*

The attribute for positive indicator species is common to each of the blanket bogs and associated Annex I habitats, and habitat-specific lists of the positive indicator species are presented in the NSUH manual (Perrin *et al.*, 2014). A positive species criterion is set to ensure that vegetation remains representative of the habitat and is not degrading or succeeding to a different habitat. The target by which this attribute is measured varies between habitats. Descriptions of these habitats can be found in the NSUH manual (Perrin *et al.*, 2014).

For some habitats, a certain number of positive indicator species is required. At least seven positive indicator species are required at each monitoring stop for 7130 Blanket bogs (\* if active bog).

7140 Transition mires require at least three positive indicator species for in-filling pools and flushes and at least six for fens, and also at least one core positive indicator species present at each monitoring stop. In addition, 25% total cover of positive indicator species is required.

For some other habitats, a percentage threshold is set. At least 50% cover of positive indicators is required for 4010 Wet heaths.

#### 5.3.2 *Vegetation composition: other desirable species*

Other elements of vegetation composition which can collectively be regarded as being desirable are also established with a range of habitat-specific targets set.

#### **Lichens and bryophytes**

Minimum thresholds for cover of lichens and bryophytes are set for habitats where a plentiful lichen/moss layer is characteristic such as 4010 Wet heaths and 7130 Blanket bogs (\* if active bog). Within the habitat-specific targets for these attributes, the specific species, or groups of species which are required, are listed together with any exclusions (e.g. *Sphagnum fallax* can be indicative of degraded bog so is excluded from the 7130 Blanket bogs (\* if active bog) assessment).

#### **Cross-leaved heath**

Cross-leaved heath (*Erica tetralix*) is specifically mentioned in the formal title of habitat 4010 Wet heaths and is the only characteristic species listed in European Commission (2013). Whilst it is seldom abundant in wet heaths, its presence at high frequencies is considered one of the few characteristics common between the varied communities of this habitat (JNCC, 2009). The target is for the presence of cross-leaved heath within a 20m radius of each monitoring stop.

### **Ericoid species and crowberry**

A dwarf shrub layer with ericoid species is characteristic of 4010 Wet heaths (crowberry (*Empetrum nigrum*) is only rarely present). Low cover of these species would be indicative of chronic overgrazing, burning, etc. The target is for at least 15% cover of these species at each monitoring stop.

#### **5.3.3 Vegetation composition: negative indicator species**

A percentage cover threshold for negative indicator species has been established for blanket bog and associated habitats, including those listed as Qualifying Interests for River Finn SAC. Habitat-specific negative indicator species lists have been established for each of the habitats and are presented in Perrin *et al.* (2014). Presence of these species would likely indicate undesirable impacts of management such as overgrazing, undergrazing, nutrient enrichment, agricultural improvement or impacts on hydrology. The percentage threshold is generally set quite low such that impacts can be reversed before they become more severe.

#### **5.3.4 Vegetation composition: non-native species**

An attribute for non-native species is common to 4010 Wet heaths, 7130 Blanket bogs (\* if active bog) and 7140 Transition mires. Non-native species can be invasive and have deleterious effects on native vegetation. The target for each habitat is for the total cover of non-native species to be less than 1%. A low target is set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances.

#### **5.3.5 Vegetation composition: undesirable native species**

For two of the Qualifying Interest habitats present in River Finn SAC, 4010 Wet heaths and 7130 Blanket bogs (\* if active bog), maximum percentage cover thresholds for undesirable native species are also set. These are detailed below.

### **Bracken, native trees and shrubs**

The cover of bracken (*Pteridium aquilinum*) and native trees and shrubs is assessed for 4010 Wet heaths. Tree and shrub cover is assessed for 7130 Blanket bogs (\* if active bog). High cover of bracken would indicate that the habitat may be succeeding towards a dense bracken community, and high cover of native trees and shrubs would indicate that the habitat may be succeeding towards scrub or woodland due to lack of grazing or, for bog habitats, due to the habitat drying out.

### **Soft rush**

High cover of soft rush (*Juncus effusus*) in 4010 Wet heaths would suggest undesirable hydrological conditions. Note, however, that poor flushes dominated by soft rush often naturally occur in mosaic with these habitats. Discrete areas of this separate habitat should not be considered here. The target is for the cover of soft rush to be less than 10%.



## Potential dominant species

For 7130 Blanket bogs (\* if active bog), a maximum threshold is given for bog species which could potentially dominate the habitat, reflecting a reduction in diversity. The selected species are ling (*Calluna vulgaris*), many-stalked spike-rush (*Eleocharis multicaulis*), hare's-tail cottongrass (*Eriophorum vaginatum*), purple moor-grass (*Molinia caerulea*), black bog-rush (*Schoenus nigricans*) and deergrass (*Trichophorum germanicum*). The target is for cover of each of the potential dominant species to be less than 75%.

## Dwarf shrub cover

A dwarf shrub layer is characteristic of 4010 Wet heaths, but the vegetation should be a mixture of dwarf shrub and graminoid species with higher cover of dwarf shrubs being potentially indicative of drainage. A maximum target of 75% is therefore set.

## 5.4 Vegetation structure

Vegetation structure is assessed through a number of attributes tailored to each of the habitats. These measures assess levels of grazing and browsing, burning and *Sphagnum* condition.

### 5.4.1 Browsing and grazing

Browsing is generally measured through viewing the last complete season's shoots of particular species and assessing the proportion which shows signs of having been browsed. The species which are assessed for browsing are generally the dwarf shrub species: ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*). The target for 4010 Wet heaths and 7130 Blanket bogs (\* if active bog) is for less than 33% of shoots to show signs of browsing. Grazing levels for 7140 Transition mires are assessed through vegetation height (see Section 5.4.4).

### 5.4.2 Burning

Fires can be part of the natural cycle of heaths and may, under carefully controlled circumstances, be used as an occasional management tool to promote regeneration of, or diversity of growth phases, in ling (*Calluna vulgaris*). However, currently most hill fires in Ireland are intentionally started to encourage grass growth for livestock. Fires that are too intense, too frequent, too extensive or which occur in sensitive areas are damaging to habitats. An assessment of burning is made for 4010 Wet heaths and 7130 Blanket bogs (\* if active bog). Habitat-specific lists of sensitive areas where burning should not occur are presented in Perrin *et al.* (2014).

4010 Wet heaths and 7130 Blanket bogs (\* if active bog) have the same targets relating to there being no signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning and no signs of burning in sensitive areas.

### 5.4.3 Sphagnum condition

Disturbance to *Sphagnum* is assessed for habitats 4010 Wet heaths and 7130 Blanket bogs (\* if active bog). High levels of disturbed *Sphagnum* would indicate undesirable levels of grazers. For both habitats, the target is for less than 10% of the *Sphagnum* cover to be crushed, broken and/or pulled up.

#### **5.4.4 Vegetation height**

Vegetation height is used as an indication of grazing intensity for 7140 Transition mires. The proportion of live leaves and/or flowering shoots of vascular plants that are more than 15cm above the ground surface should be at least 50%. Vegetation heights lower than these would indicate undesirable levels of grazing.

### **5.5 Physical structure**

The physical structure of the habitats can be damaged by drainage, walking trails, unsuitable levels of grazing and erosion. Physical structure is assessed through a number of attributes tailored to each of the habitats. Elements which are assessed for the habitats comprise disturbed bare ground, drainage and erosion; these are detailed below.

#### **5.5.1 Disturbed bare ground**

This attribute is common to all blanket bog and associated habitats listed as Qualifying Interests for River Finn SAC. Disturbance can include hoof marks, wallows, human foot prints, vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion for heaths and peatlands. The target for each habitat is set at there being less than 10% disturbed ground.

#### **5.5.2 Drainage**

Drainage can result in loss of characteristic species and transition to drier habitats. This attribute is applied to 4010 Wet heaths, 7130 Blanket bogs (\* if active bog) and 7140 Transition mires. For each habitat, the target is the area showing signs of drainage from heavy trampling, tracking or ditches to be less than 10%.

#### **5.5.3 Erosion**

Erosion is assessed for 7130 Blanket bogs (\* if active bog) as it leads to loss of peat from the blanket bog system, increases in peat sediment in nearby water courses, loss of blanket bog habitat and drainage. The target is that less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas. The greater bog mosaic incorporates the blanket bog itself and associated vegetation types and non-vegetation cover types that appear to have been derived from former blanket bog, including, but not limited to, bare peat, loose rock, gravel and running water.

### **5.6 Indicators of local distinctiveness**

Rare species (those considered at least *Near Threatened* on the appropriate Red Data List) which can be assigned to a particular habitat should be considered indicators of local distinctiveness for the habitat. The target is for no decline in distribution or population sizes of rare, threatened or scarce species associated with the particular habitat.

There is a historic record for the Flora (Protection) Order, 2015 (Statutory Instrument No. 356 of 2015) listed and *Vulnerable* marsh clubmoss (*Lycopodiella inundata*) (Wyse Jackson *et al.*, 2016) from Lough Belshade (NPWS internal files), but this species cannot be assigned specifically to 4010 Wet heaths or 7130 Blanket bogs (\* if active bog).

Where hepatic mats of the *Calluna vulgaris-Herbertus aduncus* community have been recorded within a particular habitat these should also be listed as indicators of local distinctiveness. No assessment of the conservation status of this community has been conducted but proposals for such an assessment are presented in Barron and Perrin (2014). The target for these hepatic mats is for no decline in status of hepatic mats associated with the habitat in question.

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**RIVER FOYLE & TRIBUTARIES SAC**  
**UK0030320**

# **CONSERVATION OBJECTIVES**

## Document Details

Title	<i>River Foyle &amp; Tributaries SAC Conservation Objectives</i>
Prepared By	<i>R. McKeown</i>
Approved By	<i>P. Corbett</i>
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## Revision History:

Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	January 2015	Complete review	RMK
V3	July 2017	Minor edit	PC

## Site Relationships

The River Foyle and Tributaries SAC boundary adjoins the boundary of the Owenkillew River SAC.



## 1. INTRODUCTION

EU Member States have a clear responsibility under the Habitats and Birds Directives<sup>1</sup> to ensure that all habitats and species of Community Interest are maintained or restored to Favourable Conservation Status (FCS). Natura 2000 sites have a crucial role to play in achieving this overall objective since they are the most important core sites for these species and habitats. Each site must therefore be managed in a way that ensures it contributes as effectively as possible to helping the species and habitats for which it has been designated reach a favourable conservation status within the EU.

To ensure that each Natura 2000 site contributes fully to reaching this overall target of FCS, it is important to set clear conservation objectives for each individual site. These should define the desired state, within that particular site, of each of the species and habitat types for which the site was designated.

Once a site has been included in the Natura 2000 network, Member States are required to implement, on each site, the necessary conservation measures which correspond to the ecological requirements of the protected habitat types and species of Community Interest present, according to Article 6.1 of the Habitats Directive. They must also prevent any damaging activities that could significantly disturb those species and habitats (Article 6.2) and to protect the site from new potentially damaging plans and projects likely to have a significant effect on a Natura 2000 site (Article 6.3, 6.4).

Conservation measures can include both site-specific measures (i.e. management actions and/or management restrictions) and horizontal measures that apply to many Natura 2000 sites over a larger area (e.g. measures to reduce nitrate pollution or to regulate hunting or resource use).

In Northern Ireland, Natura 2000 sites are usually underpinned by the designation of an Area of Special Scientific Interest (ASSI) under the Environment (NI) Order 2002 (as amended).

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<sup>1</sup> 92/43/EEC and 2009/147/EC (codified version of Directive 79/409/EEC as amended)

## **2. ROLE OF CONSERVATION OBJECTIVES**

Conservation Objectives have a role in

- Conservation Planning and Management – guide management of sites, to maintain or restore the habitats and species in favourable condition
- Assessing Plans and Projects, as required under Article 6(3) of the Habitats Directive - Habitats Regulations Assessments (HRA) are required to assess proposed plans and projects in light of the site's conservation objectives.
- Monitoring and Reporting – Provide the basis for assessing the condition of a feature, the factors that affect it and the actions required.

## **3. DEFINITION OF FAVOURABLE CONSERVATION STATUS**

Favourable Conservation Status is defined in Articles 1(e) and 1(i) of the Habitats Directive:

The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined in Article 1(i).

For species, favourable conservation status is defined in Article 1(i) as when:

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

### 3.1 DEFINITION OF FAVOURABLE CONDITION

Favourable Condition is defined as “the target condition for an interest feature in terms of the abundance, distribution and/or quality of that feature within the site”.

The standards for favourable condition (Common Standards) have been developed by JNCC and are applied throughout the UK. Achieving Favourable Condition on individual sites will make an important contribution to achieving Favourable Conservation Status across the Natura 2000 network.

## 4. SITE INFORMATION

COUNTY: TYRONE

GRID REFERENCE: IH 36768792

Upper G.R.	IH07938403	Lower G.R.	IC39091103
	IH09497610		
	IH10738760		
	IH29049358		
	IH40968624		

AREA: 773 ha

LENGTH: 120 km

## 5. SUMMARY SITE DESCRIPTION

The SAC includes the River Foyle and its tributaries i.e. that part of the River Finn which lies within Northern Ireland, the River Mourne and its tributary the River Strule (up to its confluence with the Owenkillew River) and the River Derg, along with two of its sub-tributaries, the Mourne Beg River and the Glendergan River. In total, the area encompasses 120km of watercourse and is notable for the physical diversity and naturalness of the banks and channels, especially in the upper reaches, and the richness and naturalness of its plant and animal communities. Of particular importance is the population of Atlantic Salmon *Salmo salar*, which is one of the largest in Europe. Research has indicated that each sub-catchment within the system supports genetically distinct populations.

The area is also important as a river habitat. In their upper catchments, the rivers are all fast-flowing spate rivers with dynamic flow regimes characterised by sequences of rapid, riffle and run. Although the banks may have been modified in the past, the channels are natural and composed of large cobble substrate with scattered boulders and sandy marginal deposits, while cobble side and point bars

and discrete sand deposits are common features. At the top end of the River Derg and its two tributaries, the aquatic flora reflect the highly acidic character of the water, with mosses and liverworts dominant. Beds of Stream Water Crowfoot *Ranunculus penicillatus* var. *penicillatus* occur where the flow is less dynamic. The River Foyle below Strabane is slow-flowing and is influenced by a tidal regime, rising and falling with the tidal cycle. Aquatic plants in the channel are extremely limited, particularly in the more saline areas; here, fucoids make up the main component.

Otter *Lutra lutra* is found throughout the system.

A small population of the now rare Freshwater Pearl Mussel *Margaritifera margaritifera* was still present in the Mourne River in the mid-nineties.

Further details of the site are contained in the ASSI Citation and Views About Management statement, which are available on the DAERA website ([www.daera-ni.gov.uk](http://www.daera-ni.gov.uk)).

## 5.1 BOUNDARY RATIONALE

Defining the extent of site boundaries for rivers is variable across the UK. The four options currently in use are:-

1. whole catchments
2. main river stem from source to mouth, tributaries and upland catchment
3. main river stem from source to mouth and tributaries
4. main river stem from source to mouth only

The option used is dependent on the qualifying features for that site and the current knowledge of distribution of that feature.

In the case of the Foyle, the qualifying features are its internationally important population of Atlantic Salmon and its *Ranunculus* community, which is found in lower sections of the River Derg and Mourne Beg River and along the Strule and Mourne Rivers down to Strabane. The River Foyle is included downstream to provide a linkage to the sea.

Much of the River Finn system occurs within the Republic of Ireland and will be included within the Republic of Ireland SAC series.

Within Northern Ireland, the upper limits for all the tributaries and sub-tributaries are determined by the international border, except for the Strule where it joins with the Owenkillew River SAC. The downstream limit of the site is largely determined by the limit of saline influence (Directive refers to Salmon *in freshwater only*), but includes a small part of the migration corridor on the River Foyle.



The lateral boundary beyond the river channel follows the same guidelines as that for all ASSIs, which is dependent on the type and quality of adjacent habitat. Much of the SAC has limited adjacent habitat. Therefore, the boundary is frequently restricted to the top of the riverbank.

Due to the size of the area, the boundary was largely derived from video footage acquired during a helicopter flight. Some information on adjacent habitats was derived from previous surveys.

The boundary uses permanent man-made features where possible. However, along some stretches of the river and woodland edge, such boundaries were absent and recognisable topographical or physical features such as breaks in slope, scrub or tree line were used.

## 6. SAC SELECTION FEATURES

Feature Type	Feature	Global Status	Size/ extent/ pop~
Species	Atlantic Salmon <i>Salmo salar</i>	B	10,001-100,000
Habitat	Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachion</i> vegetation	B	16.44 ha
Species	Otter <i>Lutra lutra</i>	C	C
Species	Sea Lamprey	D	P
Species	River Lamprey	D	P
Species	Brook Lamprey <i>Lampetra planeri</i>	D	P
Species	Freshwater Pearl Mussel <i>Margaritifera margaritifera</i>	D	R

Table 1. List of SAC selection features. Those with global status A-C will be referred to in ANNEX I.

The global status is an expert judgement of the overall value of the site for the conservation of the relevant Annex I habitat. Sites have been graded A, B or C - in the UK these gradings have been interpreted as follows:

**A** - Sites holding outstanding examples of the habitat in a European context.

**B** - Sites holding excellent stands of the habitat, significantly above the threshold for SSSI/ASSI notification but of somewhat lower value than grade A sites.

**C** - Examples of the habitat which are of at least national interest (i.e. usually above the threshold for SSSI/ASSI notification on terrestrial sites) but not significantly above this. These habitats are not the primary reason for SACs being selected.

**D** - Habitat present but not of sufficient extent or quality to merit listing as SAC feature.

There is therefore a distinction between the principal features for which sites have been selected (those graded A or B) and those which are only of secondary interest (those graded C). This is a useful distinction but it is important to note that all three grades are qualifying SAC interest features.

Click [here](#) to go to the Natura 2000 Standard Data Form for River Foyle & Tributaries SAC.

## 6.1 ASSI SELECTION FEATURES

### River Foyle & Tributaries ASSI

Feature Type	Feature	Size/ extent/
Habitat	Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic, mesotrophic to estuarine types.	120km
Species	Atlantic Salmon <i>Salmo salar</i>	
Species	Otter <i>Lutra lutra</i>	

Table 2. List of ASSI features.

## 7. CONSERVATION OBJECTIVES

The **Conservation Objective** for this site is:

**To maintain (or restore where appropriate) the**

- Atlantic Salmon *Salmo salar*
- Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitriche-Batrachion* vegetation
- Otter *Lutra lutra*

**to favourable condition.**

For each SAC feature, there are a number of component objectives which are outlined in the table below. These include a series of attributes, measures and targets which form the basis of *Condition Assessment*. The results of this will determine whether the feature is in favourable condition or not. The feature attributes and measures are found in the attached annex.

## 8. SAC SELECTION FEATURE OBJECTIVE REQUIREMENTS

Feature	Grade	Objective
Atlantic Salmon <i>Salmo salar</i>	B	Maintain and if possible expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population.
		Maintain and if possible enhance the extent and quality of suitable Salmon habitat - particularly the chemical and biological quality of the water and the condition of the river channel and substrate.
Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachion</i> vegetation	B	Maintain and if possible enhance extent and composition of community.
		Improve water quality
		Improve channel substrate quality by reducing siltation.
		Maintain and if feasible enhance the river morphology
Otter <i>Lutra lutra</i>	C	Maintain and if possible increase population numbers and distribution.
		Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water and all associated wetland habitats

## 9. ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Series of river types present with corresponding macrophyte assemblages,	Maintain and if possible enhance extent and composition of communities.
	Improve water quality
	Improve channel substrate quality by reducing siltation.
	Maintain and if possible enhance the river morphology

ranging from ultra-oligotrophic to eutrophic and brackish types.	Maintain the diversity and quality of habitats associated with the river, e.g. bog, wet grasslands, scrub and oak woodland.
Atlantic Salmon <i>Salmo salar</i>	See SAC Selection Feature Objective Requirements table.
Otter <i>Lutra lutra</i>	See SAC Selection Feature Objective Requirements table

## 10. MANAGEMENT CONSIDERATIONS

### Ownership

There are several hundred individuals or organisations with ownership or other rights associated with the area.

### Adjoining Land Use

The Glendergan and upper reaches of the Derg and Mourne Beg rivers are generally unenclosed and flow through a predominantly upland peatland landscape used for rough grazing or commercial forestry. Along the mid and lower reaches of the Derg and Mourne Beg, the rivers flow through improved or semi-improved pasture used for silage and grazing.

The river is generally fenced from the surrounding land at least along one bank top. Along the Mourne and Strule, the main adjacent agricultural uses include tilled land and silage production, in addition to stock grazing. Here, a significant proportion of the river is bounded by woodland, either as discrete woodland blocks along the valley side or as a thin bank-top belt. The river channel or the adjacent woodlands are only partially fenced.

## 11. MAIN THREATS, PRESSURES AND ACTIVITIES WITH IMPACTS ON THE SITE

Both on-site and off-site activities can potentially affect SAC/ASSI features. The list below is not exhaustive, but deals with the most likely factors that are either affecting River Foyle & Tributaries, or could affect it in the future.

Although Atlantic Salmon *Salmo salar*, Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitriche-Batrachion* vegetation and Otter *Lutra lutra* are the qualifying SAC features, factors affecting ASSI features are also considered.

**NOTE - Carrying out any of the Notifiable Operations listed in the ASSI schedule could affect the site.**

### ***Water Quality/Eutrophication***

Water quality is probably the most important single factor for the SAC and ASSI selection features, with both point and diffuse sources of pollution potentially damaging. These are dependent on human activities throughout the catchment, the majority of which are largely beyond the direct control of the current designation. The total catchment area feeding into the river system is 300,000ha, 78,000ha of which fall within the Republic of Ireland and consists of 27 sub-catchment areas in Northern Ireland. The designation only includes the main channels of the Strule, Mourne, Derg, Mourne Beg, Glendergan, Finn and Foyle rivers and has excluded several tributaries.

Analysis of biological water quality monitoring data from 1991 to 1998 indicates that water quality is good to very good on all rivers and there has been no deterioration in quality over this period. Chemical water quality monitoring data indicates that water quality is moderate in the Derg and its tributaries, but varies from moderate to poor in the Mourne and Strule.

A significant portion of the upper catchments of the tributaries are afforested; there is a potential for enrichment of the river during forestry operations (planting and fertiliser application).

Stock have open access to the channel in many sections and have caused poaching of the bank and channel. This represents another possible source of enrichment.

**ACTION: Reduce enrichment of the water column by minimising point source pollution and through a catchment-wide campaign, encourage land owners to avoid excessive fertiliser inputs, thus reducing diffuse pollution. Restrict stock access to less sensitive watering points.**

### ***Channel & Bank Modification***

A number of sections of the river channels have been extensively altered by man in the past. These modifications have changed the natural flow regime of the river, resulting in a reduction of the natural channel area available to aquatic vegetation or for spawning Atlantic Salmon. However, the river continues to recover from the effects of re-sectioning.

**ACTION: Future in-river works should be minimised as they reduce habitat and species diversity. Due to the dynamic nature of rivers, work carried out at any point on the river may have a significant impact on the catchment as a whole. Initiate discussions with Rivers Agency to co-ordinate action.**

Habitat enhancement schemes, such as the 'Salmonid Enhancement Programme' should be thoughtfully planned. Properly executed enhancement schemes can significantly improve the wildlife potential of rivers, but it is important to effectively manage the installation of structures such as weirs, as they may have a negative effect on species diversity by causing excessive damming of the channel. In the past, the construction of weirs by fishing clubs



as part of the programme has locally altered the morphology of the river. Enhancement work should be limited to areas of river that have been extensively modified by past drainage schemes and which have lost much of their natural dynamic character.

**ACTION: Initiate discussions with DARD Fisheries Division and Environmental Protection to co-ordinate action.**

### ***Substrate Siltation***

A significant portion of the area is afforested (especially the upper catchments), with a potential risk of sediment release during forestry operations, especially clear-felling.

**ACTION: Liaise with Forest Service during felling and re-stocking programmes to minimise potential impacts (including potential eutrophication from planting and fertiliser application).**

Sand wash from a number of commercial sandpits in the upper reaches of the tributary rivers has resulted in siltation of the riverbed downstream.

**ACTION: Monitor and control sediment input levels in tributaries and immediately downstream of sandpits.**

Where the bank and channel of the river are accessible to stock, damage to both the Atlantic Salmon spawning grounds and the macrophyte community may occur. Trampling has an obvious direct impact but in some sections of the river, trampling and poaching of the river bank and channel have caused erosion, resulting in siltation of the riverbed downstream.

**ACTION: Restrict livestock access to drinking areas only.**

### ***Sand Extraction***

Small-scale sand extraction from the riverbed has been an ongoing practice by farmers, particularly in the lower reaches of the river. This disturbance results in damage to the river morphology and increase in sediment loading, thus directly and indirectly affecting spawning beds and the macrophyte community.

**ACTION: Under the Notifiable Operations, this activity is prohibited - ensure compliance with the ASSI Schedule.**

### ***Fish Farms***

Fish farms can have a very serious impact on rivers. Fish farms normally abstract water from the river and release effluent downstream. Where the abstraction is large relative to streamflow, the channel between points of abstraction and release may have a much reduced discharge and water velocity. The effect can be so extreme that the upstream movement of migrating fish and other water-borne wildlife is obstructed. In addition, effluents from intensive fish farms may have a modified temperature and pH, may be contaminated with toxic materials and may carry waste and partly decomposed food and the metabolic products of the fish. This can lead to increased oxygen demand (and hence a low oxygen

concentration in the water), increased suspended solids and enrichment of the recipient stream.

NIEA is aware of two fish farms in the area, but they do not appear to be having any damaging effects on the river or the Atlantic Salmon population. Proposals for any further fish farms in the area will require very careful environmental assessment. In particular, it is imperative to ensure that an adequate compensatory flow is maintained and that the effluent is adequately treated.

**ACTION: Review existing Water Act consents.**

### ***Water Extraction***

A natural flow regime is essential for the maintenance of many of the selection features. There are several extraction sites along the river. Proposals for further water extraction in the area will require very careful environmental assessment.

**ACTION: Review existing Water Act consents.**

### ***Fly-tipping***

Small-scale fly tipping has occurred in places along the river banks and in the river channel, as well as in adjacent woodland.

**ACTION: Where practical, remove dumped material from the banks, channel and adjoining woodland to prevent the build up of debris and discourage further tipping.**

### ***Alien species***

Japanese Knotweed *Fallopia japonica*, Giant Hogweed *Heracleum mantegazzianum* and Indian Balsam *Impatiens glandulifera* are present along the riverbanks of the major rivers.

**ACTION: Monitor and if necessary, control the spread of alien species.**

### ***Nitrogen Deposition***

Excess nitrogen deposition can favour the growth of competitive plants and lead to changes in ecosystem structure or function and to a reduction in biodiversity. National scale studies show the potential adverse effects of excess nitrogen on natural and semi-natural habitats to be widespread across the UK. Lower and upper critical loads have been calculated for the River Foyle & Tributaries SAC.

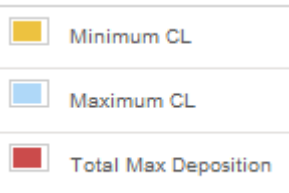
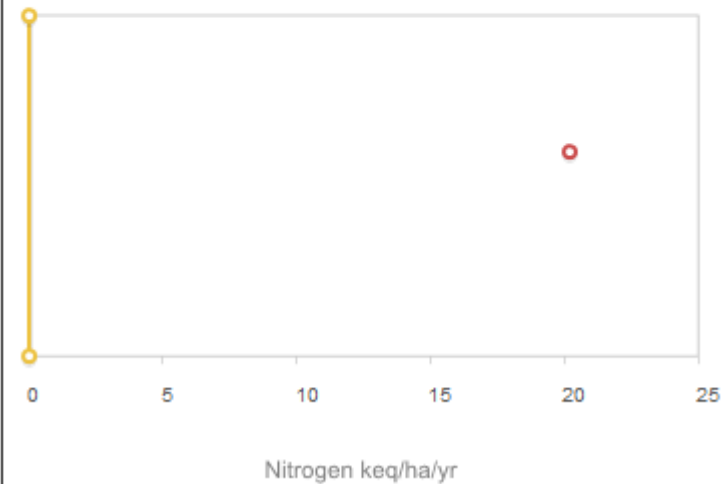
**Feature:** Salmo salar - Atlantic salmon

**Critical Load Class:** No comparable habitat with established critical load estimate available

**Critical Loads (kg N/ha/yr):** no critical loads available for this feature

**Nitrogen Deposition (kg N/ha/yr):**

Maximum: 20.2 Minimum: 5.6 Average: 8.4



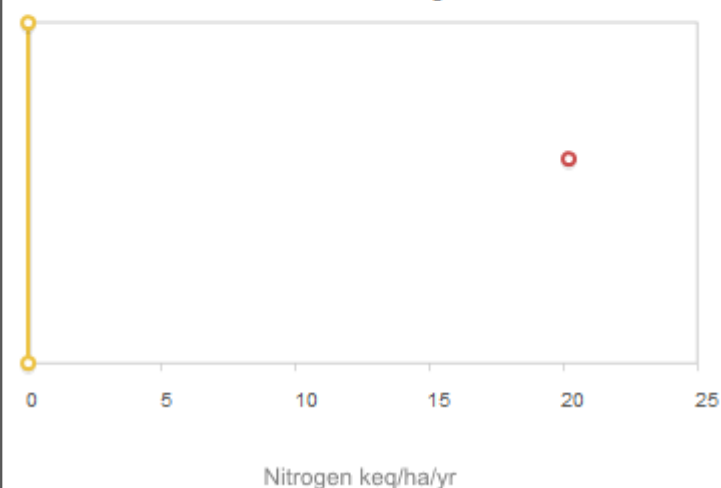
**Feature:** Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation

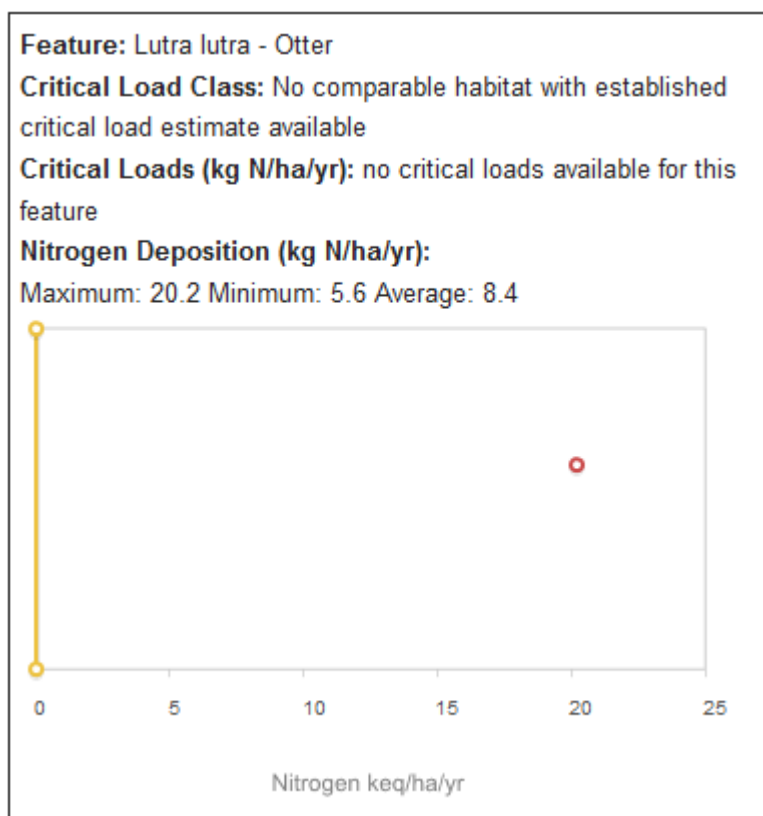
**Critical Load Class:** No comparable habitat with established critical load estimate available

**Critical Loads (kg N/ha/yr):** no critical loads available for this feature

**Nitrogen Deposition (kg N/ha/yr):**

Maximum: 20.2 Minimum: 5.6 Average: 8.4





(Source: Air Pollution Information System (APIS) website- [www.apis.ac.uk](http://www.apis.ac.uk))

**ACTION:** Seek to maintain or where necessary, restore concentrations and deposition of air pollutants to at or below the site-relevant critical load.

#### ***Changes to surrounding land use***

Any changes in local land-use e.g. agricultural intensification, drainage works and development) may be detrimental to the SAC.

**ACTION:** Reduce the risk of surrounding agricultural intensification by encouraging the adjacent owner/occupiers to enter into agri-environment schemes. Use Habitats Regulations Assessments (HRAs), through the planning process, to minimise any development risks adjacent to the SAC.

#### ***Climate Change***

Northern Ireland faces changes to its climate over the next century. Indications are that we will face hotter, drier summers, warmer winters and more frequent extreme weather events.



**ACTION:** When developing SAC management plans, the likely future impacts of climate change should be considered and appropriate changes made.

## **12. MONITORING**

Monitoring of SACs takes place using two monitoring techniques.

**Site Integrity Monitoring (SIM)** is carried out to ensure compliance with the ASSI/ SAC Schedule. The most likely processes of change will either be picked up by SIM (e.g. dumping, burning, turf cutting, grazing etc.) or will be comparatively slow (e.g. gradual degradation of the habitat).

These longer-term changes will be picked up by monitoring of the feature via **Site Condition Assessment** - this is carried out on a rolling basis to pick up subtle changes in the condition of the feature.

The method for Site Condition Assessment was agreed by the relevant JNCC-led Lead Co-ordination Network although the methodology has been modified to reflect individual site attributes in Northern Ireland.

### **12.1 MONITORING SUMMARY**

#### ***1. Monitor the integrity of the site (SIM or Compliance Monitoring)***

Complete boundary survey to ensure that the boundary features, where present are still intact. Ensure that there has been no tree felling, ground or riverbed disturbance, fly-tipping or inappropriate burning carried out within the SAC boundary. Evaluation of stocking densities would also be desirable, whilst a check for feral goat damage should be carried out throughout the site. Inspection of river reaches with Freshwater Pearl Mussel colonies should be undertaken to ensure there has not been any pearl fishing. The SIM should be carried out once a year.

#### ***2. Monitor the condition of the site (Condition Assessment)***

Monitor the key attributes for each of the SAC selection features. This will detect if the features are in favourable condition or not. See Annex I.

The favourable condition table provided in Annex 1 is intended to supplement the conservation objectives only in relation to management of established and ongoing activities and future reporting requirements on monitoring condition of the site and its features. It does not by itself provide a comprehensive basis on which to assess plans and projects, but it does provide a basis to inform the scope and nature of any Habitats Regulations Assessment (HRA) that may be needed. It should be noted that completion of a HRA is a separate activity to

condition monitoring, requiring consideration of issues specific to individual plans or projects.

### 13. REFERENCES

Cooper, A., McCann, T. and Rogers, D. (2009). Northern Ireland Countryside Survey 2007: Broad Habitat Change 1998-2007. Northern Ireland Environment Agency Research and Development Series No.09/06

Department of the Environment for Northern Ireland (2008). Northern Ireland Species Action Plan – Otter *Lutra lutra*.

European Commission (2000). Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2001). Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

European Commission (2014). Establishing conservation measures for Natura 2000 Sites.

Joint Nature Conservation Committee (JNCC) (2013). 3<sup>rd</sup> UK Habitats Directive Report.

## ANNEX I

### SAC Feature 1 – Atlantic salmon (*Salmo salar*) (Status B)

(\* = primary attribute. One failure among primary attribute = unfavourable condition)

Attribute	Measure	Targets	Comments
*Population dynamics	Number	Stable or increasing	
	Adult Run	Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea-winter component.	The Northern Ireland equivalent of Environment Agency MBAL (Minimum Biological Acceptable Level) should be set for each catchment.
	Juvenile population densities	These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality.	Expectation needs to be tempered by the intrinsic ability of the river type to support salmon. Fish classification schemes operated regionally and nationally should permit an interpretation of performance.

	Biological disturbance: Introductions	<p>The population should be naturally self-sustaining. There should be a presumption against stocking of salmon unless it is agreed to be necessary as an emergency interim measure to maintain population viability whilst underlying ecological problems are being addressed.</p> <p>No introduction or stocking of other species or sub-species at excessively high densities in salmon spawning and nursery areas.</p> <p>Effective screening on all fish farm intakes and discharges.</p>	<p>The nature conservation aim is to provide conditions in the river that support a healthy and natural population, achieved through habitat protection/restoration and the control of exploitation as necessary.</p> <p>Stocking represents a loss of naturalness and if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population. For these reasons, consideration of stocking is only justifiable in cases where population viability is threatened. Stock must come from within the same catchment area.</p> <p>The presence of artificially high densities of other fish creates unacceptably high levels of predatory and competitive pressure on juvenile salmon.</p> <p>Escapes from fish farms are a form of uncontrolled introduction and should be prevented.</p>
*Population dynamics	Exploitation	All exploitation should be sustainable without compromising any components of the stock.	Controls on exploitation should include migratory passage to the SAC within territorial waters, including estuarine and coastal net fisheries, as well as exploitation within the SAC from rod fisheries.
*Physical integrity	Disturbance of habitat	No artificial barriers significantly impairing adults from reaching existing and historical spawning grounds and smolts from reaching the sea.	In all river types, artificial barriers should be made passable. Natural barriers to potentially suitable spawning areas should not be circumvented.

	River morphology	Maintain and where necessary restore the characteristic physical features of the river channel, banks and riparian zone.	The characteristic channel morphology provides the diversity of water depths, current velocities and substrate types necessary to fulfil the spawning, juvenile and migratory requirements of the species. The close proximity of different habitats facilitates movement to new preferred habitats with age. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable within the SAC, whilst restoration <i>may/will</i> be needed in some reaches.
	River Substrate	Clean gravels should dominate channels.  <10% fines in top 30cm of spawning gravels	Elevated levels of fines can interfere with egg and fry survival through suffocation of eggs and loss of interstitial refuges for fry.  Sources of fines include run-off from arable land, land (especially banks) trampled by livestock, sewage and industrial discharges.
*Water quantity	Flow	Flow regime should be characteristic of the river. As a guideline, at least 90% of the naturalised daily mean flow should remain in the river throughout the year  Existing flow criteria already laid down for salmon should also be complied with.	River flow affects a range of habitat factors of critical importance to designated interest features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and baseflows, based on natural hydrological processes, is vital. Detailed investigations of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. Naturalised flow is defined as the flow in the absence of abstractions and discharges. The availability and reliability of data is patchy - long-term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered.



*Water quality:	Biological class. Environmental Protection's General Quality Assessment scheme. Assess every year.	'A'	Generally, water quality should not be injurious to any life stage. A wide range of water quality parameters can affect the status of interest features, but standard biological monitoring techniques provide a reasonably integrated picture in relation to many parameters. The river quality classifications used in all parts of the UK have a biological component. All classified reaches within the site that contain, or should contain, the interest feature under conditions of high environmental quality should comply with the targets given.
	Ecosystem Class. Environmental Protection's General Quality Assessment scheme. Assess every year	"A"	The River Ecosystem Classification 1995 sets standards for dissolved oxygen, biochemical oxygen demand, total and un-ionised ammonia, pH, copper and zinc. It therefore covers a number of water quality parameters that can cause problems within river systems. All classified reaches within the site that should contain the interest feature under conditions of high environmental quality should comply with the targets given.
	Soluble Reactive Phosphorus	<p><i>Targets should be set in relation to river/reach type(s and should be near background levels)</i></p> <p>Annual mean &lt;0.02mg/l - upland watercourses, &lt;0.06mg/l mid-altitude watercourses on hard substrates and &lt;0.2mg/l interim target for lowland rivers on clay substrates and large alluvial rivers.</p>	<p>The target of 25mgL<sup>-1</sup> is based on the EC Freshwater Fish Directive. A more precautionary figure has been used for salmon to help protect substrates used for salmon spawning.</p> <p>The mg/l used here are indicative values for rivers in England. The equivalent for Northern Ireland will have to be defined</p>
	Pollution	None	Pollutants such as silage or sheep dip can cause extreme mortality

	Suspended solids	Annual mean <10mgL <sup>-1</sup> (spawning & nursery grounds) Annual mean <25mg L <sup>-1</sup> (migratory passage)	Elevated levels of suspended solids can clog the respiratory structures of salmon.
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**Feature 2 (SAC) – Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitriche-Batrachion* vegetation (Status B)**

(\* = primary attribute. One failure among primary attribute = unfavourable condition)

Attribute	Measure	Targets	Comments
*Population dynamics	Extent	Coverage should be characteristic of river type.	High cover of <i>Ranunculus spp</i> is not necessarily indicative of favourable condition.
	Reproduction ( <i>only applies where control measures are implemented</i> )	<i>Ranunculus</i> should be able to flower and set seed, in suitable habitat.	Flowering outside the normal period and weed cutting or other activities that do not leave patches (at least 25% in every 100 metres of river) to flower and set seed are indicators of unfavourable condition. Use of herbicides should be avoided.
*Macrophyte assemblage	Composition	Characteristic plant species should dominate the assemblage. Indicators of unfavourable condition should be rare.	The absence of <i>Ranunculus</i> and high frequency of occurrence of blanketweed and other algae, or dominance of <i>Potamogeton pectinatus</i> are signs of unfavourable condition.
Water quantity	Flow	Flow regime should be characteristic of the river. As a guideline, at least 90% of the naturalised daily mean flow should remain in the river throughout the year.	
Physical integrity	River morphology	Maintain and where necessary restore [ <i>to an extent characteristic of the river/reach</i> ]	

	River substrate	<p>Channels should be dominated by clean gravels.</p> <p>Maximum fines content should not be too great to prevent the establishment of new plants.</p>	<p>Siltation of riverine sediments, caused by high particulate loads and/or reduced scour within the channel, is a major threat to interest features. Elevated fines levels can interfere with the establishment of <i>Ranunculus</i> plants.</p> <p>Sources of fines include; run-off from arable land, land (especially banks) trampled by livestock, sewage and industrial discharges.</p>
*Water quality:	Biological class. Environment Protection's General Quality Assessment scheme. Assess every ? years.	'A'	
	Ecosystem Class. Environment Protection's General Quality Assessment scheme. Assess every ? years	'A'	
	Suspended solids	Annual mean <10mg L-1	
	Soluble Reactive Phosphorus	<p><i>Targets should be set in relation to river/reach types (and should be near background levels)</i></p> <p>&lt;0.02mg/l - upland watercourses</p> <p>&lt;0.06mg/l mid-altitude watercourses on hard substrates</p>	

### Feature 3 (SAC) – Otter *Lutra lutra* (Status C)

(\* = primary attribute. One failure among primary attribute = unfavourable condition)

Attribute	Measure	Target	Notes
Presence of otters	Presence of one or more of the following signs within the site: Positive identification of otter spraint, footprints, tracks, paths, lying-up sites or feeding signs.	Signs of otters found at least once per year	Use data from other surveys or Ulster Museum, if available
	Sightings of otters.		
	Positive identification of holt(s).		
Bankside/ Waterside cover	Presence of cover: Mature trees, woodland, scrub, other tall bankside vegetation, reed and sedge beds.	No overall permanent decrease	Some change acceptable as long as it is appropriately mitigated
Water quality	EP water quality scale	Water quality should be at least category A or B, according to EP guidelines, with no pollution incidents	Refer to Environment Protection for data
Food Sources	Assessment of fish stocks and other food sources (e.g.amphibians)	Fish stocks appropriate to the nutrient status of the river, with no significant decline in fish biomass or species diversity	Refer to appropriate Agency for sample data if available (This information may need to be inferred from the water quality category).
Disturbance	Extent of public access to river	No significant change to river or bankside usage; no significant	



Attribute	Measure	Target	Notes
		development	
Flow rate	Mean annual flow rate	No reduction attributable to increased abstraction.	Refer to data from Rivers Agency if available
Site integrity	Total area	No reduction or fragmentation of area	



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Email: [info@byrnelooby.com](mailto:info@byrnelooby.com)