FEHILY TIMONEY

DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED COOM GREEN ENERGY PARK GRID CONNECTION

AA Screening and Natura Impact Statement

Prepared for:

Coom Green Energy Park

coom green energy

Date: **April 2026**

Core House, Pouladuff Road, Cork, T12 D773, Ireland

T: +353 21 496 4133 | E: info@ftco.ie

CORK | DUBLIN | CARLOW

www.fehilytimoney.ie

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF PLATES

LIST OF TABLES

1. INTRODUCTION

Fehily Timoney and Company (FT) was commissioned by Coom Green Energy Park Ltd. to prepare an Appropriate Assessment Screening Report and Natura Impact Statement for the Coom Green Energy Park (CGEP) Grid Connection, Co. Cork (hereafter referred to as the 'Proposed Development'). CGEP is a permitted development (ACP Ref: 308885-20) consisting of a 22-turbine wind farm, 110 kV substation, 20 no. battery energy storage containers and all associated ancillary works.

Fehily Timoney and Company (FT) has prepared this Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) on behalf of Coom Green Energy Park Ltd. The Proposed Development, for which consent is being sought, as assessed in this AA screening and NIS comprises the following elements:

- A 110 kV Underground Cable (UGC) Grid Connection Route from the permitted onsite substation at Lackendarragh to the existing Barrymore 110 kV substation located near Rathcormac, Co. Cork (also referred to herein as the ***'110 kV GCR'***);
- A 33kV Underground Cable (UGC) Collector Network Route between the western and eastern arrays of the permitted Coom Green Energy Park (CGEP) development (also referred to herein as the ***'33 kV CNR'***);
- A 110kV onsite substation at Lackendarragh, in line with the latest Eirgrid functional specifications (also referred to herein as ***'110 kV Substation'***).

This report presents an examination of whether the Proposed Development is likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and is based on best available scientific knowledge. This report has been prepared to inform the competent authority (An Coimisiún Pleanála) in completing their statutory obligations in relation to Appropriate Assessment, as required by Article 6(3) under Council Directive 92/43/EEC (Habitats Directive).

The report is set out under the following headings;

- Introduction
- Project Description
- Existing Environment
- AA Screening
- NIS
- Conclusion

1.1 Legislative Context

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) provides legal protection for habitats and species of European importance. The Directive requires that where a plan or project is likely to have a significant effect on a European Site, while not directly connected with or necessary to the nature conservation management of the site, it will be subject to 'Appropriate Assessment' to identify any implications for the European site in view of the site's Conservation Objectives. Specifically, Article 6(3) of the Habitats Directive states:

> *"6(3) Any plan or project not directly connected with or necessary to the management of the site (Natura 2000 sites) but likely to have significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*

Note: The provisions of Article 6(3) do not apply where the proposed plan or project is 'connected with or necessary to the management of the site'. In this case, the Proposed Development is not directly connected with or necessary to the management of any European site(s).

The competent authority must carry out a screening for appropriate assessment to assess, in view of best scientific knowledge, if the development, individually or in combination with another plan or project is likely to have a significant effect on the European 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, an appropriate assessment of its implications for the European Site(s) in view of the Site's conservation objectives is required to be carried out.

This report is an Appropriate Assessment Screening and a Natura Impact Statement (NIS) and presents an examination of whether the Proposed Development could have an adverse effect on the European sites (either alone or in combination with other plans or projects) and is based on best available scientific knowledge. This report has been prepared to inform the competent authority in completing their statutory obligations in relation to Appropriate Assessment, as required by Article 6(3) under Council Directive 92/43/EEC (Habitats Directive) as transposed into Irish law by Part XAB of the Planning and Development Act 2000 (as amended).

1.2 Methodology

The purpose of appropriate assessment is to assess the implications of a plan or project on European site in view of that site's conservation objectives, individually and in combination with other plans or projects.

This Natura Impact Statement presents the data and information on the project and provides an analysis comprising the scientific examinations of the project and its implications for the European sites in view of their conservation objections. Potential adverse effects are assessed in view of best scientific knowledge, based on objective information in relation to the Proposed Development including the proposed avoidance, reduction and preventive measures.

This NIS was prepared in accordance with the following guidance:

- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin (2009, updated 2010) (Environment Heritage and Local Government, 2009).
- Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission (2019). Brussels, (2019/C 33/01). OJ C 33, 25.1.2019.
- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Commission Notice (2021) Brussels, 28.9.2021 C(2021) 6913 final (European Commission, 2021).
- OPR Practice Note PN01 Appropriate Assessment Screening for Development Management, (Office of the Planning Regulator, 2021).
- Atkinson, S., Magee, M., Moorkens, E.A. & Heavey, M. (2024). Guidance on Assessment and Construction Management in Margaritifera Catchments in Ireland. https://emussels.eu/europe/conservation-guidelines.

The approach to preparing the Natura Impact Statement (NIS) is summarised as follows (based on European Commission 2021 Guidance):

- Describe the elements of the project (either alone or in combination with other plans or projects) that are likely to give rise to significant effects on the Natura 2000 Sites.
- Set out the conservation objectives of the Natura 2000 sites
- Describe how the project will affect the key species and key habitats of the Natura 2000 sites and the implications for the site's conservation objectives (e.g. loss of habitat, fragmentation, disturbance to species, mortality of species, chemical changes, hydrological or geological changes).
- Describe how the integrity of Natura 2000 sites is likely to be affected by the project.
- Describe what measures are to be introduced to avoid, reduce or remedy the adverse effects on the integrity of the Natura 2000 site.
- Consider findings and determine if potential for adverse effects on Natura 2000 sites remains after such measures have been implemented.

1.3 Statement of Authority

This report has been prepared by Maddy van der Poel and reviewed by Barbara Kasl and approved by Rita Mansfield (FT Ecologists).

Maddy is a Senior Ecologist with FT and has over 6 years' experience in ecological assessment and holds a MSc in Forestry and Nature Conservation from Wageningen University in the Netherlands. Maddy has prepared Appropriate Assessment Screening reports and Natura Impact Statements for numerous large scale infrastructure projects.

Barbara holds a BSc. (Hons) in Zoology and a PhD in Animal, Plant and Environmental Sciences from University of the Witwatersrand (Johannesburg, South Africa). She has over 20 years' experience in the environmental consulting sector as a terrestrial fauna specialist and behavioural ecologist, with experience in impact assessment and technical reporting for various projects [renewable energy, servitudes (roads, pipelines, powerlines), supporting infrastructure and town-related development (housing and industrial), mining and processing], including specialist input into national, district and municipal plans and frameworks.

Rita is an Associate at FT and holds a BSc.(Hons) in Applied Ecology and a H. Dip Environmental Protection and Pollution Control. Rita is experienced as a technical ecology lead within the environmental and planning services sector. She is a qualified ecologist with responsibility for environmental impact assessment, planning applications (conventional and strategic infrastructure development), Appropriate Assessment, foreshore licensing, and stakeholder engagement for large scale plans and projects in Ireland, including for wind energy developments and supporting infrastructure. Rita has undertaken and managed a wide range of ecological field assessments including mammal, herpetofauna, bird, fishery, invertebrate and habitat assessments. Rita has held numerous licences under the Wildlife Act and Habitats Directive for disturbance to species which included mitigation (e.g. construction of artificial otter holt, bat exclusion). Rita has provided advice on ecological / environmental design to various private and public sector clients.

2. DESCRIPTION OF THE PROJECT

The previously consented Coom Green Energy Park (CGEP) (ACP Ref: 308885-20) consists of a 22-turbine wind farm, 110 kV substation, 20 no. battery energy storage containers and all associated ancillary works. The previously consented CGEP and the Proposed Development are outlined in Plate 2-1.

The Proposed Development for which consent is being sought will consist of the following:

- Installation of 13.9 km of permanent high voltage (110 kV) and communication cabling underground between the proposed onsite 110 kV electrical substation at Lackendarragh North and the existing Barrymore 110 kV substation and all associated ancillary works.
- Installation of approximately 15.8 km of underground medium voltage (33kV) electrical and communication cabling between the western and eastern arrays of the permitted CGEP and all associated ancillary works.
- A permanent onsite 110 kV electrical substation at Lackendarragh North and associated compound to meet current transmission network specifications;
- All associated infrastructure, services and site works including excavation, earthworks, soil management, drainage and sediment control to facilitate the works;
- Forestry felling of 17.8 ha to facilitate construction and operation of the Proposed Development.

2.1.1 Proposed Development Location

The permitted CGEP is located approximately 12 km to the southeast of Mallow and approximately 13 km west of Fermoy in County Cork.

The 110kV GCR traverses the following townlands: Lackendarragh North, Moanlahan, Knockauncorrin, Mullentaura, Glanakip, Rathcormack-mountain, Coolnakilla, Knockananig, Coolmucky, Ballynahina, Corrin, Farran North, Farran South, Kill-Saint-Anne-North, Co. Cork.

The 33kV CNR traverses the following townlands: Coom (Hudson), Mullenaboree, Knockaunalour, Knocknacaheragh, Chimneyfield, Killeagh, Glannasack, Knockdoorty and Lackendarragh North, Co. Cork.

The 110kV onsite substation is located at Lackendarragh North, Co. Cork.

2.1.1 Existing Land Use and Site Context

The 110 kV GCR will consist entirely of underground cable and will connect the on-site substation to an existing 110kV substation at Barrymore, within the townland of Farran South near Rathcormac. The GCR will be ca. 13.9 km in length, with ca. 12.1 km to be constructed within the existing public road corridor and 1.8 km constructed within private lands with a land use comprising primarily existing commercial forestry track.

The 33 kV CNR is located in a predominantly agricultural area, with elevations within the site ranging from 190 m to 390 m above sea level. The landcover is classified as pastures, coniferous forest and transitional woodland scrub.

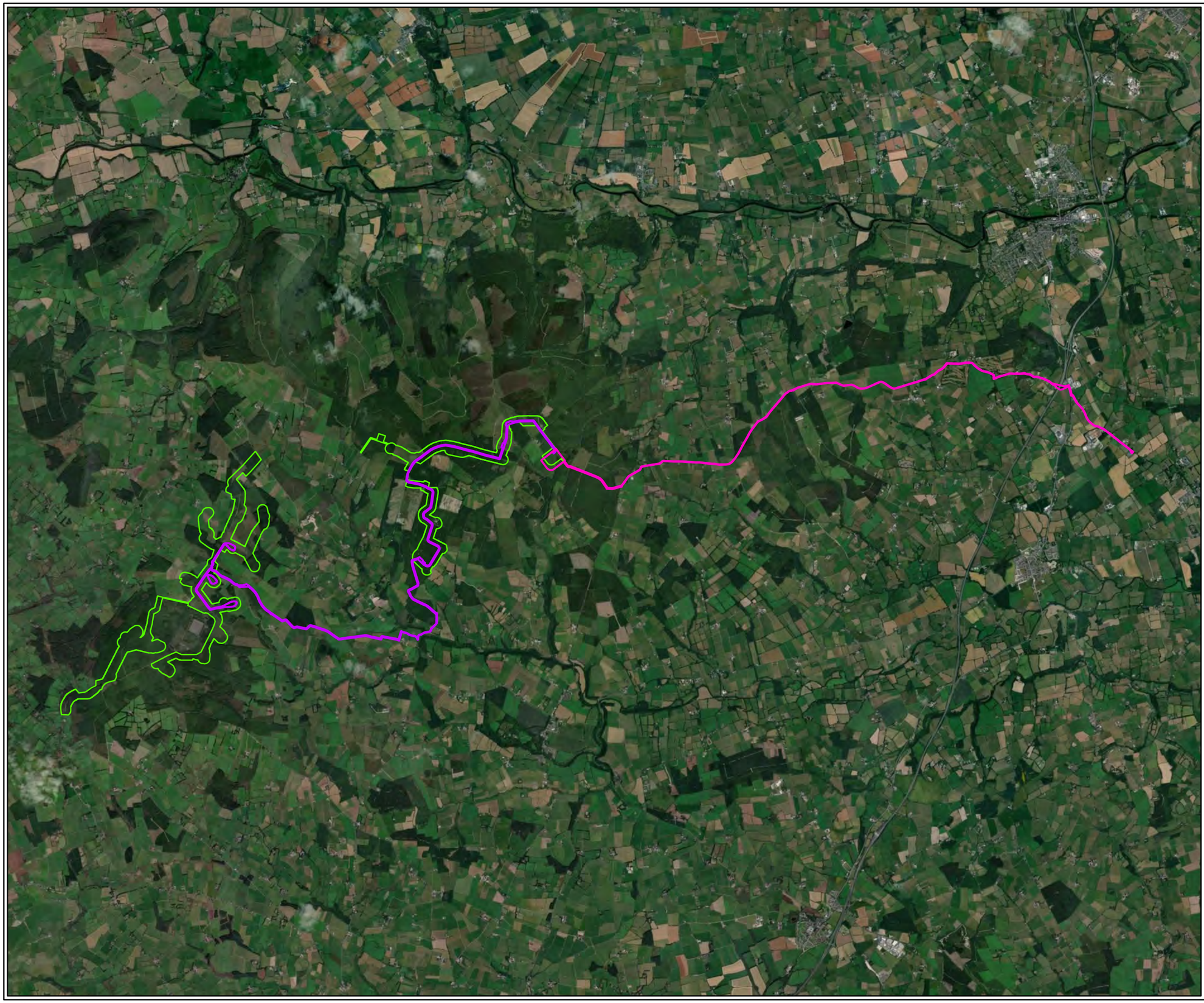
The Proposed Development is located in a sparsely populated rural context with the onsite 110kV substation located 600 m from the nearest residential property.

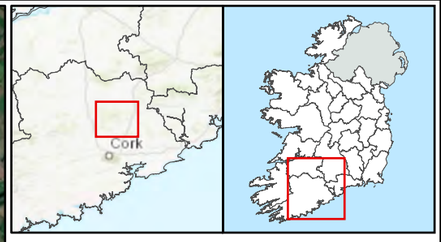
The Proposed Development is located within Hydrometric Area No. HA 18, Blackwater (Munster), of the Irish River Network System. It is situated in the Southwestern River Basin District (SWRBD).

The majority of the Proposed Development is underlain by till derived from Devonian Sandstones with limited areas of bedrock sub-crop or outcrop.

The Proposed Development will utilise the same site accesses as the consented CGEP development and is accessible from both the east and west via the N72 and N20 national roads respectively and local road network. Access from the east is via the M8 motorway and N72 national road, turning south from the east of the village of Ballyhooly, with the route then travelling along the local road network for approximately 9 km. Access to the site from the west is via the N20 national road and along the local road network for approximately 3.5 km to an existing Coillte forestry entrance which will be upgraded and utilised for the Proposed Development.

Path: R:\Map Production\2024\P24-308\Workspaces\P24_308_NIS_Figures\P24_308_NIS_Figures.aprx





Legend

- Consented Coom Green Energy Park (CGEP)
- 33kV Site Boundary
- 110kV Site Boundary

N
W E
S

0 0.5 1 2 Kilometers

TITLE:	Proposed Development		
PROJECT:	Coom Green Energy Park Grid Connection		
FIGURE NO:	2.1		
CLIENT:	Coom Green Energy Ltd.		
SCALE:	1:75,000	**REVISION:**	0
DATE:	20/04/2026	**PAGE SIZE:**	A3

FEHILY TIMONEY
Cork | Dublin | Carlow
www.fehilytimoney.ie

2.2 Proposed Development Infrastructure

2.2.1 110 kV Underground Cable (UGC) Grid Connection Route (GCR)

The 110kV GCR (shown in Plate 2-1) is approximately 13.9 km in length and traverses in a western direction from the Barrymore 110kV substation to the CGEP 110kV substation utilising public road networks and permitted wind farm access tracks. No overhead lines are required for this connection.

There is approximately 1.8 km of the 110kV GCR within private lands, of which 1.5 km is within the consented CGEP site boundary, and an additional 12.1 km within public road.

For a detailed description of the construction methodologies associated with the Proposed Development, please refer to the TLI Construction Methodology Report.

The 110kV GCR shall feature horizontal directional drilling (HDD) to cross the M8 Motorway. See Section 2.4.1.4 of Chapter 2 of the EIAR for further details of the M8 Motorway crossing. Details on watercourse crossings are summarised in Section 2.4.1.3 of this report.

Cabling works will involve the installation of ducting, joint bays, drainage and ancillary infrastructure and the subsequent running of cables along private lands and the existing road network. This will require delivery of plant and construction materials, followed by excavation, laying of cables and subsequent reinstatement of trenches.

2.2.1.1 Cable Ducts and Trenches

A minimum separation distance of 300 mm will be maintained with existing services. Usually, the new cables will be laid below existing services where possible.

The cable trench is typically 825mm wide by 1,315mm deep, with variations on this design to adapt to service crossings and watercourse crossings, etc. The ducts will be installed, the trench reinstated in accordance with landowner/ Cork County Council specification. Construction method statements and templates will be implemented to ensure that the underground HV ducting is installed in accordance with the correct requirements, materials, and specifications of ESBN and EirGrid.

Details of the cable and trench installation and construction methodologies are contained within the TLI Construction Methodology Report and the CEMP.

2.2.1.2 110kV Joint Bays

There are 20 no. joint bays along the 110kV GCR. Of these, 17 no. shall be located in public roads, and 3 no. shall be located on private lands.

Joint bays are pre-cast concrete chambers (typically 6m x 2.5m x 2.05m in size) where individual lengths of cables are joined to form one continuous cable. They are to be installed below finished ground level, approximately every 650m - 850m along the cable route to facilitate the jointing of the 110 kV GCR.

Joint Bays will be located in the non-wheel bearing strip of roadways where possible, however given the narrow profile of local roads this may not always be possible.

Further details on joint bay construction methodologies can be found in the TLI Construction Methodology Report.

2.2.1.3 Water Crossings

The 110 kV GCR will cross an EPA-mapped WFD watercourse at one location, and the 33 kV CNR will cross EPA-mapped WFD watercourses at three locations. In addition to these crossings of WFD watercourses, there are 63 no. minor watercourse crossings (small streams and man-made drains) along the proposed route. For details on all watercourse crossings, please refer to Section 2.2.4.

Horizontal directional drilling (HDD) will be employed at several locations along the 110kV GCR as part of the Proposed Development.

Crossing existing culverts will be implemented using open trenching with either an undercrossing or an overcrossing, depending on the depth of the culvert.

The proposed crossing designs have been designed in line with Inland Fisheries Ireland (IFI) requirements for salmonid watercourses as included in their 2016 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016)' and TII 'Guidelines for the Crossing of Watercourses During the Construction of Road Schemes (NRA, 2008)'. Details of proposed crossing structures are presented in the accompanying planning application drawings.

The watercourse crossing construction methodologies can be found in the TLI Construction Methodology Report and the CEMP.

2.2.2 33 kV Underground Cable (UGC) Collector Network Route (CNR)

The 33kV CNR (shown in Plate 2-1) is approximately 15.8 km in length and traverses in an eastern direction from the western wind parcel of the permitted Coom Green Energy Park (CGEP) to the permitted substation at Lackendarragh North using public roads, commercial Coillte forestry lands and private agricultural lands.

Of the total 15.8 km 33 kV CNR length, 14.7 km is located within third-party lands and 1.1 km within public road. Approximately 7.1 km of the CNR is located outside the permitted CGEP development boundary. Of this, 1.1 km is location in public roads with 6 km located in private lands.

For a detailed description of the proposed 33kV CNR, please refer to the TLI Construction Methodology Report.

Connection works will involve the installation of ducting, joint bays, drainage and ancillary infrastructure and the subsequent running of cables along private lands and the existing road network. This will require delivery of plant and construction materials, followed by excavation, laying of cables and subsequent reinstatement of trenches.

2.2.2.1 Cable Ducts and Trenches

The 33kV CNR will transmit electricity via a three-phase supply, using three individual conductors (or cables) per circuit. Each conductor will be installed in a separate duct, typically laid in a trefoil formation, though flat formation may be used where required.

The cable trench is typically 450 mm wide and 1250 mm deep. In areas requiring a triple circuit, the trench will have a width of 1550 mm and depth of 1250 mm. Trench dimensions may vary at watercourse and service crossings.

Duct installation and trench reinstatement will follow the requirements of Cork County Council when within public roads, and landowner specifications on private land.

Details of the cable and trench installation and construction methodologies are contained within the TLI Construction Methodology Report.

2.2.2.2 33kV Joint Slabs

There are 23 no. joint slabs along the proposed 33kV CNR.

Joints slabs are to be installed approximately every 1,000m - 1,200m along the 33kV CNR to facilitate the jointing of 2 no. lengths of cabling. Joint slabs are typically 2.5m x 1.575m x 0.2m concrete slabs installed below finished ground level and will be located in the non-wheel bearing strip of roadways / access tracks where possible.

Further details on joint slab construction methodologies can be found in the TLI Construction Methodology Report.

2.2.3 110kV Substation

It is proposed to construct a 110kV onsite substation at Lackendarragh North, as shown in Plate 2-1 which will meet current EirGrid specifications.

The dimensions of the substation compound will be approximately 115 m x 145 m (16,571 m2) and will include a 110kV substation control building and electrical components necessary to export the electricity generated from the CGEP wind farm to the national grid including a transformer compound and busbar compound.

The control building will include an Independent Power Producer (IPP) Medium Voltage (MV) switch room and grid operator control rooms, an office space and welfare facilities for staff during the operational phase of the wind farm.

The 110kV substation EirGrid control building shall be single story with an area of approximately 450m². The IPP control building shall be single story with an area of approximately 300m².

The substation compounds will be surrounded by a ca. 2.6m high steel palisade fence and internal fences will also be provided to segregate different areas within the main substation compound.

Lighting will be required on site, and this will be provided by lighting poles located around the substation and exterior wall mounted lights on the control buildings.

Due to the nature of the Proposed Development and the low frequency use, drinking water will be provided via bottled supply if needed. Toilet facilities will include a low-flush toilet and low-flow wash basin, with minimal water demand. This water will be sourced through a rainwater harvesting system from the building roofs, eliminating the need for a potable water supply. Wastewater from the welfare facilities will not be treated on-site. Instead, it will be collected in a sealed underground storage tank and removed periodically by a licensed waste collector to an approved wastewater treatment facility. This approach is widely accepted for wind farm developments and has been endorsed by multiple Planning Authorities and An Coimisiún Pleanála. The storage tank will be equipped with an automated alarm system to provide advance notice when emptying is required. Full specifications of the alarm system will be submitted to the Planning Authority prior to the commencement of site works. The alarm will be integrated into the site's remote monitoring system, which continuously tracks data from turbines, wind measurement devices, and the substation 24 hours a day, 7 days a week. Only waste collectors with valid permits under the Waste Management (Collection Permit) Regulations, 2007 (as amended) will be authorised to transport wastewater from the site.

The substation compound will also contain external electrical and ancillary infrastructure including the following:

- Cable sealing ends;
- Surge arrestors;
- Cable disconnectors;
- Post insulators;
- Circuit breakers;
- Current and voltage transformers;
- Steel gantry's and cable chairs;
- Power transformers; Power quality compensation equipment;
- Concrete plinths and bunds;
- External lighting;
- Lightening protection masts;
- Telecommunications masts;
- Security cameras;
- Palisade fencing and gates.

2.2.4 Proposed Watercourse Crossings

The Proposed Development will require for the 33 kV CNR to cross WFD surface waterbodies at three locations and the 110 kV GCR to cross a WFD surface waterbody at one location, as detailed in Table 2-1 and shown on Plate 2-2. Excluding WFD surface waterbodies, there are a further 58 watercourses (smaller streams and drains) which will be crossed by the Proposed Development, also shown on Plate 2-2. The four WFD crossings and 63 other watercourse crossings have been numbered 1 to 67 for identification purposes.

2.2.4.1 33 kV Collector Circuit Watercourse Crossings

The proposed 33 kV CNR is proposed to cross the Toor River (EPA Code 18T51) twice, at ITM coordinates 564133.20, 591667.40 (crossing ID 54) and approximately 750 m further downstream at ITM coordinates 564710.767,591159.095 (crossing ID 52) (refer to Table 2.1)

The 33 kV CNR will also cross the Bride River at ITM coordinates 568359.058, 590213.390 (crossing ID 46). This crossing will be achieved by laying the cable into the existing bridge deck on the L-1501 which traverses the Bride River.

2.2.4.2 110 kV GCR Watercourse Crossing

The 110 kV GCR crosses the Farran North River (EPA Code 18F27) approximately 700 m northwest of the existing Barrymore 110 kV substation, at ITM coordinates 582025.51, 594306.6 (crossing ID 2). The L-1517 traverses above the watercourse by means of a single arch bridge. As described in TLI's construction methodology, the bridge has insufficient depth to install the 110 kV GCR with a minimum of 450mm cover to top of ducts, therefore it is proposed to utilise a to Horizontal Directional Drill (HDD) to traverse below the watercourse and bridge structure. The proposed HDD will be implemented to bore a minimum of 1,500mm beneath the watercourse bed.

The HDD works are proposed to launch the drill shot from the western side of the structure within the curtilage of the public road (L-1517), travel beneath the watercourse bed and for the drill shot to exit to a receptor pit on the eastern side of the structure within the curtilage of the public road (L-1517).

Table 2-1: WFD Stream Crossings

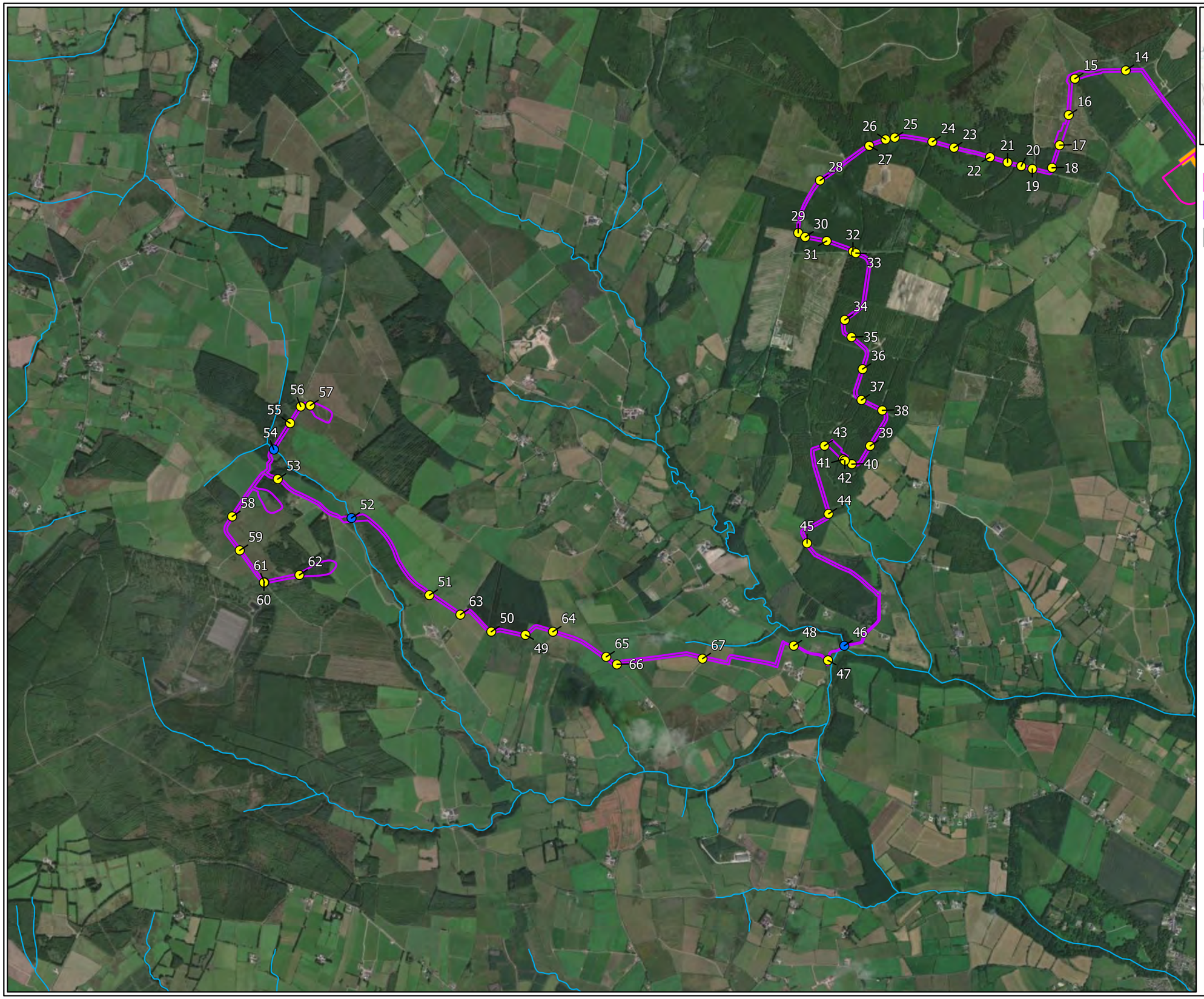
Crossing ID	EPA name	EPA code	ITM_X	ITM_Y	Feature/Activity	Proposed Method of Crossing
54	Toor River	18T51	564133.20	591667.40	33 kV CNR crossing over the Toor River (upstream)	To be laid in the permitted wind farm access track which will cross the surface waterbody with a box culvert
52	Toor River	18T51	564710.767	591159.095	33 kV CNR crossing over the Toor River (downstream)	33 kV CNR to cross beneath watercourse by horizontal direction drilling (HDD)
46	Bride [Waterford]	18B05	568359.058	590213.390	33 kV CNR crossing the River Bride	Cable to be laid in the existing bridge deck
2	FARRAN_NORTH	18F27	582025.51	594306.6	110 kV GCR crossing the Farran North river	110 kV GCR to cross beneath watercourse by horizontal direction drilling (HDD)

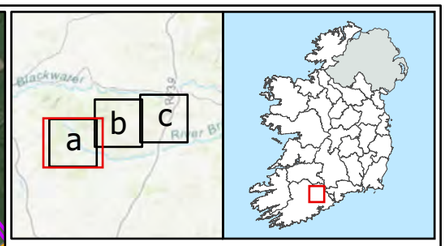
2.2.4.3 Minor Watercourse Crossings

There are 63 minor watercourse crossings required as part of the Proposed Development. These minor watercourses include non-WFD surface waterbodies and drains. The locations of these crossings are shown on Plate 2-2.

Two non-WFD surface waterbodies (streams) will be crossed by HDD. These surface waterbodies are tributaries of the Bride (Blackwater)_020. Both HDD crossings of non-WFD streams are along the 33 kV CNR, one at ITM 570092, 594419 (crossing ID 15), the other HDD crossing at ITM 568212, 591692 (crossing ID 43).

Path: R:\Map Production\2024\P24-308\Workspaces\P24_308_NIS_Figures\P24_308_NIS_Figures.aprx





Legend

- 110kV Site Boundary
- 33kV Site Boundary
- Substation Compound
- Rivers
- Non-WFD surface waterbody and drain crossings
- WFD surface waterbody crossing

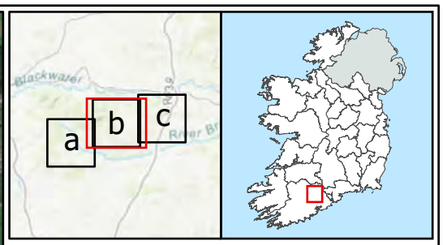
N
W E
S

0 0.5 1 2 Kilometers

TITLE:	WFD Surface Waterbody Crossings		
PROJECT:	Coom Green Energy Park Grid Connection		
FIGURE NO:	2.2.a		
CLIENT:	Coom Green Energy Ltd.		
SCALE:	1:27,500	**REVISION:**	0
DATE:	20/04/2026	**PAGE SIZE:**	A3

FEHILY TIMONEY
Cork | Dublin | Carlow
www.fehilytimoney.ie

Path: R:\Map Production\2024\P24-308\Workspaces\P24_308_NIS_Figures\P24_308_NIS_Figures.aprx



Legend

- 110kV Site Boundary
- 33kV Site Boundary
- Substation Compound
- Rivers
- Non-WFD surface waterbody and drain crossings

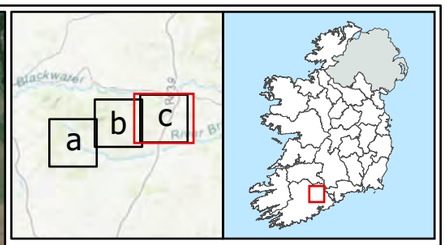
N
W E
S

0 0.5 1 2 Kilometers

TITLE:	WFD Surface Waterbody Crossings		
PROJECT:	Coom Green Energy Park Grid Connection		
FIGURE NO:	2.2.b		
CLIENT:	Coom Green Energy Ltd.		
SCALE:	1:27,500	**REVISION:**	0
DATE:	20/04/2026	**PAGE SIZE:**	A3

FEHILY TIMONEY
Cork | Dublin | Carlow
www.fehilytimoney.ie

Path: R:\Map Production\2024\P24-308\Workspaces\P24_308_NIS_Figures\P24_308_NIS_Figures.aprx



Legend

- 110kV Site Boundary
- 33kV Site Boundary
- Substation Compound
- Rivers
- Non-WFD surface waterbody and drain crossings
- WFD surface waterbody crossing

N
W E
S

0 0.5 1 2 Kilometers

TITLE:	WFD Surface Waterbody Crossings		
PROJECT:	Coom Green Energy Park Grid Connection		
FIGURE NO:	2.2.c		
CLIENT:	Coom Green Energy Ltd.		
SCALE:	1:27,500	**REVISION:**	0
DATE:	20/04/2026	**PAGE SIZE:**	A3

FEHILY TIMONEY
Cork | Dublin | Carlow
www.fehilytimoney.ie

2.3 Construction Activities

Subject to Planning Permission being granted for the Proposed Development, tree felling, upgrading of existing site tracks and the provision of new site tracks will precede all other activities. Drainage infrastructure will be constructed in parallel with the access track construction. This will be followed by the construction of the onsite 110kV substation and 33kV CNR as well as the 110 kV GCR works. Construction methodologies are provided in the CEMP .

2.3.1 Construction Programme

The construction of the Proposed Development in its entirety is expected to take 12 months. The construction of the Proposed Development shall be carried out during the wider CGEP development construction programme which will be carried out over 18 - 24 months.

2.3.2 Hours of Construction

The hours of construction activity for the Proposed Development will be limited to avoid unsociable hours as per Section 6.3 (d) of BS 5228: Code of practice for noise and vibration control on construction and open sites, Part 1: Noise. Construction operations will generally be restricted to between 08:00 and 19:00 Monday to Friday and between 7:00 and 13:00 on Saturdays. However, to ensure that optimal use is made of fair-weather windows, or at critical periods within the programme, it could occasionally be necessary to work outside these hours. Any such out of hours working would be agreed in advance with the local planning authority. It should be noted that it may be necessary to commence turbine base concrete pours earlier due to time constraints incurred by the concrete curing process. Further details on working hours and restrictions of same are provided in the CEMP.

2.3.3 CEMP

The CEMP sets out the key environmental management measures associated with the construction, operation and decommissioning of the Proposed Development, to ensure the environment is protected, and any potential impacts are minimised. The CEMP will be developed further at the construction stage, on the appointment of the main contractor to the Proposed Development to address the requirements of any relevant planning conditions, including any additional mitigation measures that are conditioned.

The CEMP document is divided into six sections:

Section 1: Introduction provides details on the existing site and the Proposed Development.

Section 2: Existing Site Environmental Conditions provides details of the main existing geotechnical, hydrological, ecological and archaeological conditions onsite. These conditions will be considered by the Contractor in the construction, operation and decommissioning of this Proposed Development and the prescribed measures complied with.

Section 3: Overview of Construction Works, this section provides an overview of the construction works proposed and drainage and sediment controls to be installed.

Section 4: Environmental Management Plan (EMP), this section outlines the main requirements of the EMP and outlines controls for the protection of the environment for example soil management, waste management, traffic management, site drainage management, site reinstatement & decommissioning, habitat and archaeology management etc.

Section 5: Safety & Health Management Plan, this section defines the work practices, procedures and management responsibilities relating to the management of health and safety during the design, construction and operation of the Proposed Development.

Section 6: Emergency Response Plan contains predetermined procedures to ensure the safety, health and welfare of everybody involved in the Proposed Development and to protect the environment during the construction phase of the Proposed Development.

2.3.4 Surface Water Management

Drainage measures required for the construction of the 110kV GCR, 33kV CNR and the onsite 110kV substation will incorporate Sustainable Drainage Systems (SuDS). This design approach ensures that existing drainage patterns will be maintained throughout the site.

The proposed drainage design is the primary mitigation measure for the protection of waterbodies, incorporating silt protection infrastructure and control measures to reduce the rate of surface water runoff from the Proposed Development.

The drainage system for the Proposed Development will be constructed alongside all access tracks, substation and the temporary construction compound. The drainage system for the existing tracks will largely be retained. Where the roads require widening, this will involve the re-location of existing roadside swales to allow for widening.

Further details on hydrology and drainage are contained in the Surface Water Management Plan (SWMP) which is contained in the CEMP.

2.3.5 Tree Felling

As outlined in Section 2, the total felling required for the Proposed Development is 17.8 ha. Of this, 10.2 ha of this is already accounted for within the felling area included in the permitted CGEP. The additional felling required arises from the 33kV CNR modifications and the new footprint of the 110kV onsite substation at Lackendarragh North. Conversely, certain areas previously identified for felling under the permitted CGEP are no longer required due to the updated 33kV CNR and the non-requirement of the Mullenaboree substation.

Overall, the combined felling required to accommodate both the Proposed Development and the permitted CGEP is 65.2 ha.

2.3.6 Temporary Site Compounds

During construction, it will be necessary to provide temporary facilities for construction personnel. Two temporary site compounds, the locations of which are shown in the CEMP. Wheel wash facilities will be provided within the site near the site entrance point.

Temporary facilities will be removed, and the lands reinstated on completion of the construction phase.

2.4 Operation

A 30-year operational permission is being sought for the connection of the permitted CGEP to the national grid.

The onsite 110kV substation and 110kV GCR will be taken in charge by ESBN / EirGrid upon completion of construction and shall be left in place forming part of the national electricity network.

The 110kV GCR and 33kV CNR will operate unmanned during the operational phase. Periodical maintenance may be required during the operational phase to inspect and or repair some of the cable routes.

2.5 Decommissioning

The 110kV GCR and onsite substation within Lackendarragh North and ancillary electrical equipment will form part of the national grid and will be left in situ.

The 33kV CNR that connects each turbine will be removed from the cable ducting. The cabling will be pulled from the cable duct using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at each of the joint bays/pull pits along the cable. The access track will be excavated using a mechanical excavator at each cable pulling pit location and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance for an underground element that is not visible.

It is proposed that all access tracks will be left in place. These will continue to be used for forestry and agriculture.

A detailed decommissioning plan will be agreed in advance of construction with Cork County Council.

2.6 Ecological assessment

In order to inform this NIS, it was necessary to establish the baseline ecological conditions in the existing environment, particularly in regard to European sites. This was achieved through a desk study, consultation feedback and carrying out field surveys. This process is outlined in Sections 2.6.1 – 2.6.3.

2.6.1 Desk study

The desk study involved a review of the following data (accessed in February 2026):

- OSI Aerial photography and 1:50000 mapping
- Geological Survey Ireland (GSI) maps and data
- Flora (Protection) Order Map Viewer – Vascular Plants, Charophytes and Lichen • Flora Protection Order Map Viewer – Bryophytes
- Article 17 GIS and Metadata - Terrestrial Habitats Storymap
- EPA website datasets (land, soil and water)
- Wetland survey Ireland wetland maps:
- Inland Fisheries Ireland open data portal

Other sources included:

- Triturus Environmental Ltd (2025) Aquatic baseline report for grid connection of the proposed Coom Green Energy Park, Co. Cork
- Inis Environmental Consultants (IEC) (2020). *Environmental Impact Assessment Report (EIAR) for the proposed Coom Green Energy Park, County Cork: Volume 2 – Main EIAR, Chapter 8 – Biodiversity*
- INIS Environmental Consultants Ltd. (2020). *Coom Green Energy Park — Natura Impact Statement (NIS)*. Coom Green Energy Park Ltd

2.6.2 Consultation

For the Proposed Development, a consultation letter was issued out to all consultees in March 2025 to inform them of the works required for the grid connection.

Specific to ecological assessment and designated sites, the environmental stakeholders listed in Table 2-2 were contacted.

Table 2-2: Environmental stakeholder consultation

Organisation/Stakeholder	Date of Response	Response
Birdwatch Ireland	No response to date	No response to date
Department of Housing, Local Government & Heritage (2024) (via DAU)	None	No comment / response received
Environmental Protection Agency	05/03/2025	The response from the Environmental Protection agency detailed that the email has been forwarded to the EIA/Planning team. No further response has been received.
Inland Fisheries Ireland	No response to date	No response to date
Irish Peatland Conservation Council	05/03/2025	A detailed response was received from the Irish Peatland Conservation Council. It outlined the following key points and suggestions for consideration: • Consideration for the impact on destruction of peatland landscapes on wildlife (birds, damselflies, dragonflies and butterflies) listed on the species red list that inhabit peatlands. • The inclusion of peatland restoration/rehabilitation and environment stabilisation in the development. • Consideration to include the following research report "The Habitats of Cutover Raised Bog, George F. Smith & William Crowley, Irish Wildlife Manual 128, NPWS, 2020" into the project's literature review, due to the potential of non-high-bog areas becoming active raised bog SACs. • Having regard to all National and European legislation and conventions related to peatlands. • Having regard to the Environmental Protection Agency funded project BOGLAND. • Consideration on the impact regarding nitrogen and its effects on nature habitats, as well as the implementation of long-term monitoring of emission rates/vectors to inform future projects. • Consideration for the protection of ground nesting birds and that vegetation removal is illegal from 1st of March to 31st of August. • The carrying out of training of construction workers regarding vegetation destruction. • Consideration of the investigation of carbon inputs/outputs. • Identify the methods proposed to mitigate carbon, assess the impact from drainage, quantify the volume of peat removal and restore habitats.

Organisation/Stakeholder	Date of Response	Response
		• The carrying out of ornithology surveys for species on the Bird Red List (emphasis on Curlew) and investigation of all red listed species within the National Biodiversity Data Centre, as week as mitigation works if a susceptible species is identified. • Having regard to the impact on wetland sites (WMI_C0218,WMI_C0219, WMI_C0220, WMI_C0221, WMI_C0222) and liaising with Wetland Surveys Ireland. • Ensure there is no loss of fen habitat. • Consideration to include the following research report "Use of Peat Depth Criteria: Accounting for the lost peatlands – IUCN UK Peatland Programme" into the project's literature review. • Mitigation of the risk of spreading invasive species due to people/vehicle movements. • The organisation states that they do not support developments without archaeological surveys.
Irish Raptor Study Group	No response to date	No response to date

2.6.3 Field surveys methodology

2.6.3.1 Habitats and Flora

The habitats within the study area (Proposed Development and a 20 m buffer) were identified and classified according to Fossitt (2000), undertaken on the 9 and 11 September 2025. The plant species present in each habitat type were recorded. All species were readily identifiable during the field surveys, which were completed during the appropriate botanical season. Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2019). Botanical species were assessed in accordance with their occurrence on the Flora (Protection) Order 2022 and The Ireland Red List No. 10: Vascular Plants. Other species records were assessed according to the Irish Red Data Lists.

Invasive plants, including species listed on the Third Schedule to the Habitats Regulations, and other species which can negatively impact biodiversity were recorded and mapped during the habitat survey.

2.6.3.2 Otter

Otter (*Lutra lutra)* surveys were undertaken (14, 15 and 30 April 2025) in conjunction with the aquatic survey. Surveys were undertaken in accordance with the NRA's (2005) '*Ecological Surveying Techniques for Protected Flora and Fauna During the Planning of National Road Schemes*',JNCC's (2004) '*Common Standards Monitoring Guidance for Mammals*', Chanin (2003) *Monitoring the Otter Lutra lutra and* (Reid et al, 2013) National Otter Survey of Ireland 2010/12. The study area of otter was 150m upstream and downstream of each of the aquatic survey sites.

2.6.3.3 Hen Harrier Roost Survey

Winter roost survey methods followed those in the Irish Hen Harrier Winter Survey (IHHWS) (O'Donoghue, 2019) and Hardey et al. (2013). . A 1 km study area was used as core foraging range based on habitat suitability (SNH, 2016). Surveys were undertaken 19 December 2024, 17 and 23 January 2025, 6, 20, 25 and 28 February 2025, 5, 6, 10, 11, 19, 20, 24 and 25 March 2025.

For each target area, two surveyors simultaneously conducted VP surveys starting three hours prior to dusk and continuing until observations are no longer feasible in the dark per IHHWS guidelines (O'Donoghue, 2019). IHHWS guidelines state that surveyors must be present at minimum 40 minutes before dusk, so survey effort exceeded that required by IHHWS guidelines. Surveyors recorded all hen harrier flight lines and roosting behaviour.

2.6.3.4 Aquatic Surveys

The full Aquatic Report (Triturus Environmental Ltd, 2025) is provided in Appendix A. Aquatic surveys were conducted on the 14th, 15th and 30th April 2025. Survey effort focused on both instream and riparian habitats at each aquatic sampling location and included a fisheries habitat appraisal, white-clawed crayfish survey, macrophyte and aquatic bryophyte survey and biological water quality sampling (Q-sampling). This holistic approach informed the overall aquatic ecological evaluation of each site/watercourse in context of the proposed development and ensured that any habitats and species of high conservation value would be detected to best inform mitigation.

In addition to the ecological characteristics of the site, a broad aquatic and riparian habitat assessment was conducted utilising elements of the methodology given in the Environment Agency's 'River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003' (EA, 2003) and the Irish Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000). This broad characterisation helped define the watercourses' conformity or departure from naturalness. All sites were assessed in terms of:

- Physical watercourse/waterbody characteristics (i.e. width, depth, channel form) including associated evidence of historical drainage
- Substrate type and relative condition, listing substrate fractions in order of dominance (i.e. bedrock, boulder, cobble, gravel, sand, silt etc.)
- Flow type by proportion of riffle, glide and pool in the sampling area
- An appraisal of the macrophyte and aquatic bryophyte community at each site
- Riparian vegetation composition and bordering land use practices

3. EXISTING ENVIRONMENT

The Proposed Development overlaps with the Blackwater (Cork/Waterford) SAC where it traverses over the River Bride. The River Bride is a tributary of the SAC. As outlined in Section 2.2.4, the works over the watercourse use the existing bridge structure and the cables are installed within. This is the only overlap of the boundary of the SAC.

3.1.1 Hydrology

The Proposed Development is contained within 1 no. WFD catchment unit, the Blackwater (Munster) (catchment ID 18) of the Irish River Network System. The Proposed Development extends across 3 no. WFD sub-catchment units. The western portion of the Proposed Development, comprising the 33 kV CNR as well as the 110 kV Substation is contained entirely within the Bride [Waterford]_SC_010; while the 110 kV GCR straddles the boundary between the Bride [Waterford]_SC_010 and the Blackwater[Munster]_SC_110 for approximately 4 km, and terminates in the east in the Bride[Waterford]_SC_020, where it is proposed to connect into the existing Barrymore 110 kV substation.

The Proposed Development site is drained by the Toor River and the Bride River within the Bride [Waterford]_SC_010 sub-catchment, by the North Lackendaragh River in the Blackwater[Munster]_SC_110 sub-catchment, and by the Shanowen (Bride) River and the Shanowennadrimina Stream in the Bride[Waterford]_SC_020 sub-catchment.

Table 3-1: WFD River Status and River Waterbody Risk

Waterbody	EPA CODE	River Status	Waterbody Risk
Tooreen North	18T33	Good	At Risk
Coom_010	18C03	Moderate	At Risk
Toor River	18T51	Poor	At Risk
Lyravarrig	18L66	Good	Review
Bride (Waterford)	18B05	Moderate	At Risk
Bunnaglanna	18B07	Poor	At Risk
Inchinanagh	18I16	Good	Not at Risk

Table 3-2: Existing Water Quality at WFD Stream Crossings

EPA name	EPA code	ITM_X	ITM_Y	Feature/Activity	Proposed Method of Crossing	Results of Water Quality Monitoring (Physio-chemical)	Results of Biological Water Quality (Q-sampling)
Toor River	18T51	564133	591667	33 kV CNR crossing over the Toor River (upstream)	To be constructed as part of permitted wind farm access track	The results from location WQSP5 indicate that agricultural lands are being drained to the surface waterbody. However, in general, the lab results indicate high-quality surface water, with good aeration and low organic pollution.	Q4-5 - "High Status"
Toor River	18T51	564710	591159	33 kV CNR crossing over the Toor River (downstream)	Proposed cable route to cross beneath watercourse by horizontal direction drilling (HDD)	The results from location WQSP5 indicate that agricultural lands are being drained to the surface waterbody. However, in general, the lab results indicate high-quality surface water, with good aeration and low organic pollution.	Q4-5 - "High Status"
Bride [Waterford]	18B05	568359	590213	33 CNR cable crossing the River Bride	Cables to be laid in the existing bridge deck	The results from location WQSP7 indicate that agricultural lands are being drained to the surface waterbody. However, in general, the lab results indicate high-quality surface water, with good aeration and low organic pollution.	Q4-5 - "High Status"
FARRAN_NORTH	18F27	582074	594274	110 kV GCR crossing the Farran North River	Insufficient clearance in existing bridge deck. Proposed cable route to cross beneath watercourse by horizontal direction drilling (HDD)	The results from location WQSP14 indicate that agricultural lands are being drained to the surface waterbody. However, in general, the lab results indicate high-quality surface water, with good aeration and low organic pollution	Q3 - "Poor Status"

3.1.2 Habitats and Flora

The Proposed Development is predominately within forestry and alongside the existing road. The construction footprint utilizes these existing roads and forestry tracks where possible, with the aim to retain as much natural habitat as possible. Based on a review of aerial imagery and online mapping tools, the wider environs of the Proposed Development are characterised predominantly by conifer plantation forestry and agricultural grasslands. According to the CORINE Land Cover Map, the site and surrounding area are classified as grassland, forest, woodland, and scrub. A review of the NPWS Map Viewer of Article 17 Habitats (2019) indicates the presence of Annex I Old Oak Woodland (91A0) along the banks of the River Bride, 800 m downstream of the Proposed Development.

During the terrestrial and aquatic surveys, no habitats within the study area corresponded to Annex I habitats. The habitat map is presented in Figure 9.1 in Volume 4 of the EIAR.

BC3 - Tilled land

This habitat had previously been agricultural land that has recently been cleared and reseeded with grass.

BL2 - Earth banks

The most common type of field and roadside boundary within the study area are vegetated earth banks. This linear habitat type occurred along public roads and was dominated by Scaly Male-fern (*Dryopteris affinis*), Brambles (*Rubus fruticosus*), Bilberry (*Vaccinium myrtillus*), Common Bent (*Agrostis capillaris*), and Heather (*Calluna vulgaris*). The vegetation on these banks is often merged with a narrow strip of grassy verge (GS2) habitat along the roadsides and access tracks.

ED2 - Spoil and bare ground

Areas of spoil and bare ground were present across the site along tracks with heavy traffic.

ED3 - Recolonising bare ground

Recolonising bare ground habitat occurs on bare ground and/or gravel tracks where a range of ruderal species have begun to recolonise. Recolonising bare ground was recorded in disturbed areas of the site and was dominated by Annual Meadow-grass (*Poa annua*), Perennial Rye-grass (*Lolium perenne*), Water Mint (*Mentha aquatica*), Yorkshire-fog (*Holcus lanatus*), Soft-rush (*Juncus effusus*), and Brambles.

GA1 - Improved agricultural grassland

Along with conifer plantation, this habitat was the most widely recorded habitat across the study area. The GA1 improved agricultural grassland was dominated by Perennial Rye-grass and Yorkshire-fog, with additional grasses including Common Bent. The sward was generally species-poor and managed, though occasional herbs and ruderal species are present, including Sheep's Sorrel (*Rumex acetosella*), Soft-rush, and Willowherb species (*Epilobium* sp.). The habitat reflects improved pasture typical of lowland agricultural landscapes.

GA2 - Amenity grassland (improved)

Improved amenity grassland was recorded in areas of managed lawns and roadside verges. It provides low ecological value due to low sward height and species diversity.

GS3 - Dry-humid acid grassland

The GS3 dry-humid acid grassland was characterised by a mixed sward of grasses and herbs on acidic soils. Grasses such as False Oat-grass (*Arrhenatherum elatius*), Cock's-foot (*Dactylis glomerata*), Sweet Vernal-grass (*Anthoxanthum odoratum*), and Common Bent are frequent, with Soft-rush occurring in damper patches. The herb layer includes typical acid grassland species such as Tormentil (*Potentilla erecta*), Trailing Tormentil (*Potentilla anglica*), Silverweed (*Potentilla anserina*), Marsh Thistle (*Cirsium palustre*), Wild Angelica (*Angelica sylvestris*), Meadow Vetchling (*Lathyrus pratensis*), Foxglove (*Digitalis purpurea*), Common Ragwort (*Senecio jacobaea*), Common Sorrel (*Rumex acetosa*), and Common Nettle (*Urtica dioica*). Scrub species including Bramble occur locally, reflecting some structural variability within the grassland.

GS3 - Dry meadows and grass verges

This habitat was represented by small areas of roadside or access tracks with grassy verges. Species recorded included False Oat-grass, Yorkshire-fog, Cock's-foot, Bramble (*Rubus fruticosus* agg.), Bush Vetch (*Vicia sepium*), and Common Nettle.

GS4 - Wet grassland

The GS4 wet grassland habitat on site was dominated by Soft-rush and Sharp-flowered Rush (*Juncus acutiflorus*) alongside Yorkshire-fog, Common Bent, Tufted Hair-grass (*Deschampsia cespitosa*), and Sheep's-fescue (*Festuca vivipara*). The herb layer included species such as Creeping Buttercup (*Ranunculus repens*), Lesser Spearwort (*Ranunculus flammula*), Marsh Bedstraw (*Galium palustre*), Tormentil, Greater Bird's-foot-trefoil (*Lotus pedunculatus*), Marsh Cinquefoil (*Comarum palustre*), and Marsh Thistle, with Meadow Thistle (*Cirsium dissectum*) also recorded. Other species included Bramble, Gorse (*Ulex europaeus*), and Rosebay Willowherb (*Chamerion angustifolium*).

HD1 - Dense bracken

This habitat type is dominated by dense swards of Bracken (*Pteridium aquilinum*).

HH3 - Wet heath

There were two occurrences of HH3-Wet heath within the study area. Both areas were dominated by Purple Moor-grass (*Molinia caerulea*). Heather was present but not abundant, alongside Bilberry. The species composition was a mosaic of wet grassland and heath-associated species, including Common Sedge (*Carex nigra*), Common Yellow-sedge (*Carex demissa*), Soft-rush, Sharp-flowered Rush, Velvet Bent (*Agrostis canina*), Sweet Vernal-grass, Crested Dog's-tail (*Cynosurus cristatus*), and Sheep's-fescue (*Festuca ovina*). Flowering herbs recorded include Meadow Buttercup (*Ranunculus acris*), Tormentil, Greater Bird's-foot-trefoil, Selfheal (*Prunella vulgaris*), Ribwort Plantain (*Plantago lanceolata*), and Sheep's Sorrel. Scrub species included Bramble and Rosebay Willowherb and scattered Grey Willow (*Salix cinerea*), where encroachment and modification is likely due to farming and forestry practises adjacent to these habitats.

WD1 - (Mixed) broadleaved woodland

The WD1 mixed broadleaved woodland comprises a canopy dominated by Beech (*Fagus sylvatica*), with additional broadleaved species including Grey Willow and Alder (*Alnus glutinosa*). Occasional non-native or planted species such as European Larch (*Larix decidua*) are present within the woodland structure. The understorey is generally sparse but includes scrub species such as Gorse. The occurrence of this habitat type is transitional between WS1 and WD4 and does not form connectivity to larger unmanaged woodlands.

WD4 - Conifer plantation

The WD4 conifer plantation is dominated by commercial conifer species, principally Sitka Spruce (*Picea sitchensis*) and Norway Spruce (*Picea abies*). Scattered broadleaved trees occur throughout the plantation, including Grey Willow, Alder, Sessile Oak (*Quercus petraea*), Beech, Sycamore (*Acer pseudoplatanus*), Hazel (*Corylus avellana*), and Holly (*Ilex aquifolium*). The shrub layer is generally sparse but locally developed, comprising Bramble, Gorse, Honeysuckle (*Lonicera periclymenum*), and Ivy (*Hedera helix*). Ground flora is variable and includes areas of Heather, Purple Moor-grass, Tufted Hair-grass, Great Wood-rush (*Luzula sylvatica*), Soft-rush, and Rosebay Willowherb. Fern species recorded include Hard-fern (*Blechnum spicant*), Broad Buckler-fern (*Dryopteris dilatata*), Scaly Male-fern, and Bracken.

WS1 - Scrub

The WS1 scrub habitat was a mix of woody scrub and tall herb vegetation, with Grey Willow dominating in most occurrences, especially in wetter areas such as along riparian zones. Other woody species recorded include Hawthorn (*Crataegus monogyna*), Hazel, Gorse, and Bramble, with occasional scattered trees such as Sitka Spruce and rare records of Apple (*Malus pumila*). The ground and field layers comprise a mix of grasses and tall herbs, including Tufted Hair-grass, Wild Angelica, and Willowherb species. This habitat type formed transitional areas and provided diversity along edges of WD4.

WS2 - Immature woodland

The occurrence of this habitat type was a small area of mixed conifer and broadleaf saplings less than 5 m in height across from the conifer plantation. These habitats are important to Hen Harrier as transitional woodland and for other species.

WL1 - Hedgerows

Hedgerow habitat on site was representative of common species such as Ivy, Hawthorn, and Hazel.

WL2 - Treelines

Treeline habitat along the edges of the conifer plantation were comprised of Lodgepole Pine (*Pinus contorta*). Treelines planted along field boundaries comprised of Italian Alder (*Alnus cordata*) and Rowan (*Sorbus aucuparia*).

3.1.2.1 Protected Flora

No rare or protected flora species protected under the Flora (Protection) Order; S.I. No. 235 of 2022 (FPO), listed in Annex II and IV of the EU Habitats Directive (92/43/ECC), or listed in the Irish Red Data lists were recorded during the surveys.

Habitat suitability for Marsh Fritillary (*Euphydryas Aurinia)* was considered during the habitat and flora surveys. While devil's-bit scabious (*Succisa pratensis*) No suitable habitat or larval webs were observed during the survey.

3.1.2.2 Invasive Species

Two Third Schedule invasive species were identified during the habitat survey in separate locations. Himalayan knotweed (*Persicaria wallichii)* was recorded along the 33 kV grid connection between Coom (Middleton) and Knockaunlour at the edge of the WD4 - Conifer, at Watercourse Crossing 43, Plate 3-1. Himalayan Basalm (*Impatiens glandulifera*) was recorded near Farran South within the 110 kV grid connection footprint alongside the L1517 near the watercourse crossing of the Shanowen Trib 1 Stream (Watercourse Crossing 2). A map of these locations is provided in Figure 9.2, Volume 4 of the EIAR.

Plate 3-1: Himalayan knotweed infestation at drainage ditch crossing along 33 kV at Watercourse Crossing 49

3.1.3 Fauna

3.1.3.1 Hen Harrier

Hen Harrier is a QI species of the Mullaghanish to Musheramore Mountains SPA. Hen Harrier have been previously recorded in the study area (NBDC). The Nagle Mountains, north of the Proposed Development are within the known breeding range of Hen Harrier.

Hen Harrier Roost watches were carried out across eight VPs between December 2024 and March 2025. Figure 9.3 and Figure 9.4 contained within Volume 4 of the EIAR shows the location of the Hen Harrier VPs and the Hen Harrier flight lines recorded during the surveys. Only watches carried out at Hen Harrier VP2 returned observations of Hen Harrier during the surveys.

The first record was on 19 December 2024 and was an individual male travelling southwest for 60 seconds within the 0-10m height band, from the VP area between two areas of conifer woodland where it briefly perched in a tree and went out of view.

The second observation was recorded on 6 February 2025 and involved a male soaring and circling over mature conifers for 135 seconds within the 25-100m height band, moving in a north westerly direction.

Three records were of immature males, with the two records on 20 February 2025 involving the same individual, flying south over pasture close to the road before heading west over a copse of mature conifers to the west before disappearing from sight briefly and reappearing low over young conifers, with the flight lasting 180 seconds, and the second record lasting 30 seconds. The final observation took place on 25 of February 2025 and was of a juvenile male, flying east over the road near the VP while being mobbed by Hooded crows, crossing over agricultural fields to conifer forestry, then flying south over mature conifers.

While the remaining roost watches did not return any observations, areas were assessed for their suitability as Hen Harrier roosts.

At VP4 it was noted that there was a lot of conifer forestry north of the VP, but the area close to the VP was near a busy public road (L2956 and L1501) and a large corvid roost was present in the vicinity.

VP6 and VP7 were among mature conifer plantations, with young conifer and scrub present, suitable for Hen Harrier roosts.

Apart from Hen Harrier, two other Annex I listed species were identified as non-target species during Hen Harrier roost watches. Golden plover was observed on three occasions, once on 23 January 2025 from VP7, and twice on 6 February 2025 from VP2. The observation from VP 7 involved approximately 600 individuals circling approximately 2 km southeast of the VP. Observations from VP2 included a group of 65 individuals 2 km south of the VP going east, with a second group of 25 individuals 1 km south of the VP also travelling east. One individual Peregrine was recorded once from VP4 on 6 March 2025.

3.1.3.2 Otter

Annex II otter *(Lutra lutra*) records were widespread throughout the respective grid squares (W69, W68, W79 and W89). Records were available for the River Bride, including at Bride Bridge (NPWS & Triturus Environmental Ltd. data). A record was also available for the Inchinanagh River, a tributary of the River Bride, within the wider survey area (Triturus Environmental Ltd. data). Otter is a QI species of the Blackwater River (Cork/Waterford) SAC.

Despite suitability at many survey sites in terms of prey resources (e.g. salmonids), otter signs (spraint sites or latrines) were only recorded at 2 no. sites during the 2025 survey (Triturus Environmental Ltd., 2025). Both were on the River Bride, where previous otter records exist. No breeding (holts) or resting (couch) areas were identified in the vicinity of the crossing survey sites in April 2025.

3.1.3.3 Fisheries

The River (Waterford) Bride, the major watercourse within the survey area, is known to support Atlantic salmon (*Salmo salar*), lamprey *(Lampetra sp.),* and European eel *(Anguilla anguilla*) (Triturus Environmental Ltd. data; Matson et al., 2019; Kelly et al., 2013).

Numerous sea lamprey (*Petromyzon marinus*) records were available for the Munster Blackwater catchment (e.g. River Blackwater, Clyda River) but no records overlapped with the survey area. River lamprey *(Lampetra fluviatilis*) records were available for the River Blackwater and the lower River Bride at Rathcormack Bridge (not within survey area) (Triturus Environmental Ltd., 2025).

Results of the Toor River (COOM_010) survey (IFI, 2018) had records of Brown trout, European eel and Salmon.

Salmonids

The surveys undertaken by Triturus Environmental Ltd, found that the Farran North River (Watercourse crossing 4, shown in Plate 2-2) was of good value for salmonids with mixed cohorts observed.

The survey locations along the Toor River (two watercourse crossings, Table 2-1) serve as good to moderate nursery habitat for salmonids. The presence of oxygenated riffle-glide sequences supports salmonid recruitment.

The survey locations along the Field Chimney stream had moderate quality salmonid nurseries, with Atlantic Salmon known to be present from previous surveys (Triturus Environmental Ltd, 2020). These high-energy cascading channels offer localized spawning pockets in lower-gradient glides.

The survey location along the Bunnaglanna Stream had good quality nursery habitat throughout, though spawning is limited by high bed mobility.

Lamprey

Lamprey habitat suitability was limited across the watercourse crossing locations due to high energy flow and substrate quality. Farran North was the exception, where silt deposits provided good quality lamprey ammocoete (nursery) habitat. Lamprey have previously been recorded from this site (previously consented CGEP).

3.1.3.4 Freshwater Invertebrates

No white-clawed crayfish were recorded via hand-searching or sweep netting of instream refugia at any of the aquatic survey sites in April 2025. Only the Farran North River exhibited habitat suitability (i.e. rocky refugia and deeper water). Furthermore, inspection of mustelid spraint at 2 no. sites on the River Bride did not reveal the presence of crayfish remains (Triturus Environmental Ltd., 2025). The results are in keeping with the absence of records for the species in the survey area (nearest record is the River Blackwater at Fermoy) and this is largely reflective of unsuitable water chemistry and habitats in the survey area (Demers et al., 2005; Lucy & McGarrigle, 1987).

No Freshwater Pearl Mussel or suitable habitat was observed within the Proposed Development during the surveys by FT in February 2026.

4. SCREENING FOR APPROPRIATE ASSESSMENT

4.1 Introduction

This section of the report examines if the Proposed Development is likely to have a significant effect upon European sites, either alone or in combination with other plans or projects.

4.2 Establishing the Zone of Influence

The OPR (2021) AA Screening practice note states that the Zone of Influence must be established on a case-by-case basis using the Source-Pathway-Receptor model. The S-P-R model has been used to identify the ZoI to ensure that relevant European sites are identified. The S-P-R model minimises the risk of overlooking distant or obscure effect pathways, while also avoiding an over reliance on buffer zones (e.g. 15 km), within which all European sites should be considered. This approach follows the DoEHLG (2009 rev 2010) guidance on AA which states that:

> *"For projects, the distance could be much less than 15 km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects".*

For an effect to occur, all three elements of this mechanism must be in place. The absence of one of the elements of the mechanism means there is no likelihood for the effect to occur. The likely effects of the Proposed Development are set out in Section 3.1 of this report. The impact is essentially the 'source' in the S-P-R model.

These impacts may be very localised and confined to the Proposed Development site with no potential connectivity to a European site and therefore no potential for effects. Alternatively, where an ecological or functional pathway exists, they may give rise to a potential effect to a Qualifying Interest of a European site. This section of the report identifies the potential pathways to European sites emanating from these potential sources of impact.

The ZoI of the Proposed Development has been identified as:

- Any European sites hydrologically connected to the Proposed Development via surface water or groundwater. This includes EPA mapped watercourses and unmapped drainage features which discharge to EPA mapped watercourses. The River Blackwater (Cork/Waterford) SAC is hydrologically connected to the Proposed Development with watercourse crossings over WFD and unmapped field drains that ultimately discharge into the SAC.
- Any European site with groundwater-dependent terrestrial ecosystems hydrologically connected to the Proposed Development. regard is had to SEPA guidelines (SEPA, 2014) which prescribes a zone for potential hydrogeological effects as 250 m from ground works. The River Blackwater (Cork/Waterford) SAC is hydrologically connected to the Proposed Development and GWTE are included as QIs for the SAC.
- All SACs designated for Lesser Horseshoe bats within 10 km of the Proposed Development, as a precautionary upper foraging range (Bontadina et al., 2002; Biggane, 2003). There are no SACs designated for Lesser Horseshow bats within 10 km of the Proposed Development.

- All SPAs within 550 m of the Proposed Development which is the precautionary flushing distance for waterbirds informed by the sensitivity of different species to the potential for visual and noise disturbance, and the ambient disturbance levels (Cutts et al., 2009; Cutts et al., 2013). There are no SPAs within 550 m of the Proposed Development.
- Any European site within 150 m of the Proposed Development, as the NRA (2008) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes notes a 150m potential disturbance zone for otter for breeding holts and 20m for nonbreeding active holts. The River Blackwater (Cork/Waterford) SAC is within 150 m of the Proposed Development.
- Any European site designated for wintering birds within 20 km of the Proposed Development to account for mobile species that may utilise habitats outside of SPA boundaries for foraging or roosting (based on the largest documented core foraging range for SPA birds (SNH, 2016).
- Any European site designated for Hen Harrier within 50 km of the Proposed Development. Although this is outside the typical breeding forage range for Hen Harrier (a maximum range of 10km (SNH, 2016)), wintering ranges can be more extensive as hen harrier are considered partial migrants as the species' has a wide foraging range during the wintering period.

Based on the Zone of Influence as outlined above, only one European site, the Blackwater River (Cork/Waterford) SAC occurs within the zone of influence of the Proposed Development.

4.3 Likely Effects of the Receiving Environment

Having regard to the European Commission (2021) guidance document and the OPR (2021) practice note, the potential impacts of the Proposed Development on the receiving environment are as follows:

- In-channel works can cause barriers for movement and fragment habitats for mobile species.
- Accidental pollution and sedimentation can impact water quality and degrade aquatic habitats downstream. This can have indirect effects on aquatic species.
- Noise, vibration and human presence during the construction phase of the Proposed Development could potentially have disturbance / displacement effect on fauna.
- Tree felling can remove available habitat for SCI species.
- Air pollution due to dust and other airborne emissions; and
- The potential spread of invasive species during the proposed works.

Table 4-1: Identification of European Sites within the Zone of Influence of the Proposed Development

European Site (Code)	List of Qualifying Interests	Distance from the Proposed Development (km)	Criteria	Pathway for potential effects	Considered further in screening (Y/N)
Blackwater River (Cork/Waterford) SAC (002170)	• [1029] Freshwater Pearl Mussel *Margaritifera margaritifera* • [1092] White-clawed Crayfish *Austropotamobius pallipes* [1095] Sea Lamprey *Petromyzon marinus* • [1096] Brook Lamprey *Lampetra planeri* • [1099] River Lamprey *Lampetra fluviatilis* • [1103] Twaite Shad *Alosa fallax* • [1106] Atlantic Salmon *Salmo salar* • [1130] Estuaries • [1140] Mudflats and sandflats not covered by seawater at low tide • [1220] Perennial vegetation of stony banks • [1310] Salicornia and other annuals colonizing mud and sand	Within the footprint	Hydrologically connected European Sites	The construction of the Proposed Development may impact surface water quality due to sediment and nutrient runoff, concrete washout, tree felling and potential oil spills from plant and machinery and wastewater generated onsite. A decrease in water quality could affect aquatic species and habitats.	Y
			Mobile Species	Mobile species including otter and Atlantic salmon could be subject to habitat degradation through accidental pollution or sedimentation and disturbance and habitat fragmentation from in-channel works.	

European Site (Code)	List of Qualifying Interests	Distance from the Proposed Development (km)	Criteria	Pathway for potential effects	Considered further in screening (Y/N)
	• [1330] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) • [1355] Otter *Lutra lutra* • [1410] Mediterranean salt meadows (Juncetalia maritimi) • [1421] Killarney Fern *Trichomanes speciosum* • [3260] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation • [91A0] Old sessile oak woods with Ilex and Blechnum in the British Isles • [91E0] *Alluvial forests with Alnus glutinosa and Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) • [91J0] *Taxus baccata* woods of the British Isles		Invasive species	There is a risk that machinery or materials brought onto the site could act as a vector for introducing or dispersing non-native invasive species downstream.	
Blackwater Callows SPA (004094)	• [A038] Whooper Swan (*Cygnus cygnus* • [A050] Wigeon (*Anas penelope*) • [A052] Teal (*Anas crecca*) • [A156] Black-tailed Godwit (*Limosa limosa*) • [A999] Wetlands	4.4 km	Mobile Species	The closest point of the proposed development to the Blackwater Callows SPA is approximately 4.2 km. However, at this location the works are within the public road. Where the proposed development crosses potential ex situ habitat, is 17.1 km from the SPA boundary.	N

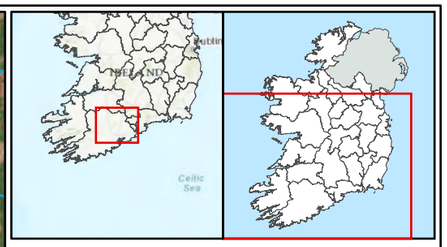
European Site (Code)	List of Qualifying Interests	Distance from the Proposed Development (km)	Criteria	Pathway for potential effects	Considered further in screening (Y/N)
				The wintering foraging range of the QI species of the Blackwater Callows SPA are the following, Whooper Swan has been reported up to 5 km from roosting sites (NatureScot, 2016), Teal a commuting distance between roost and feeding areas of approximately 2.2 km (Legagneux et al., 2009), Wigeon typically up to 5 km from roost sites (Fox et al., 1996; Wernham et al., 2002), And the maximum foraging range of Black-tailed Godwit as a precautionary distance of up to 11 km, based on distances for similar wader species (NatureScot, 2016). Given that the closest area affecting potential ex-situ habitat is 17.1 km from the SPA, which exceeds the typical winter foraging ranges of the QIs listed above, ex-situ impacts are considered unlikely.	

European Site (Code)	List of Qualifying Interests	Distance from the Proposed Development (km)	Criteria	Pathway for potential effects	Considered further in screening (Y/N)
				Additionally, given the nature and the scale of the proposed development of phased and temporary works and underground infrastructure which is largely confined to existing roads, and the availability of similar habitat in the surrounding environment, no likely significant impacts are anticipated.	
Kilcolman Bog SPA (004095)	• [A038] Whooper Swan (*Cygnus cygnus* • [A052] Teal (*Anas crecca*) • [A857] Shoveler (*Spatula clypeata*) • [A999] Wetlands	19.5	Mobile Species	The wintering foraging range of the QI species of the Kilcolman Bog SPA SPA are the following, Whooper Swan has been reported up to 5 km from roosting sites (NatureScot, 2016), Teal and Shoveler (dabbling ducks) have a foraging range of 1-2 km from (Legagneux et al., 2009). Given that the closest area affecting potential ex-situ habitat is 19.5 km from the SPA, which exceeds the typical winter foraging ranges of the QIs listed above, ex-situ impacts are considered unlikely.	N

European Site (Code)	List of Qualifying Interests	Distance from the Proposed Development (km)	Criteria	Pathway for potential effects	Considered further in screening (Y/N)
				Additionally, given the nature and the scale of the proposed development of phased and temporary works and underground infrastructure which is largely confined to existing roads, and the availability of similar habitat in the surrounding environment, no likely significant impacts are anticipated.	
Mullaghanish to Musheramore Mountains SPA (004162)	• [A082] Hen Harrier (*Circus cyaneus)*	40.8	Mobile Species	While the site is within the potential range of wintering Hen Harrier, as partial migrants, surveys undertaken recorded only occasional observations of the species. No roosting sites or communal roosting behaviour were identified during the surveys. The Proposed Development involves the removal of conifer plantation in linear sections along existing forestry tracks for track widening. Given the scale and linear nature of the works, the absence of identified roosts, and the availability of similar habitat within the wider environment, the proposed works, no likely significant impacts are anticipated.	N

European Site (Code)	List of Qualifying Interests	Distance from the Proposed Development (km)	Criteria	Pathway for potential effects	Considered further in screening (Y/N)
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)	• [A082] Hen Harrier (*Circus cyaneus)*	48.1	Mobile Species	While the site is within the potential range of wintering Hen Harrier, as partial migrants, surveys undertaken recorded only occasional observations of the species. No roosting sites or communal roosting behaviour were identified during the surveys. The Proposed Development involves the removal of conifer plantation in linear sections along existing forestry tracks for track widening. Given the scale and linear nature of the works, the absence of identified roosts, and the availability of similar habitat within the wider environment, the proposed works, no likely significant impacts are anticipated.	

Path: R:\Map Production\2024\P24-308\Workspaces\P24_308_NIS_Figures\P24_308_NIS_Figures.aprx



Legend

- 110kV Site Boundary
- 33kV Site Boundary
- Substation Compound
- 550m
- Special Area of Conservation
- Rivers

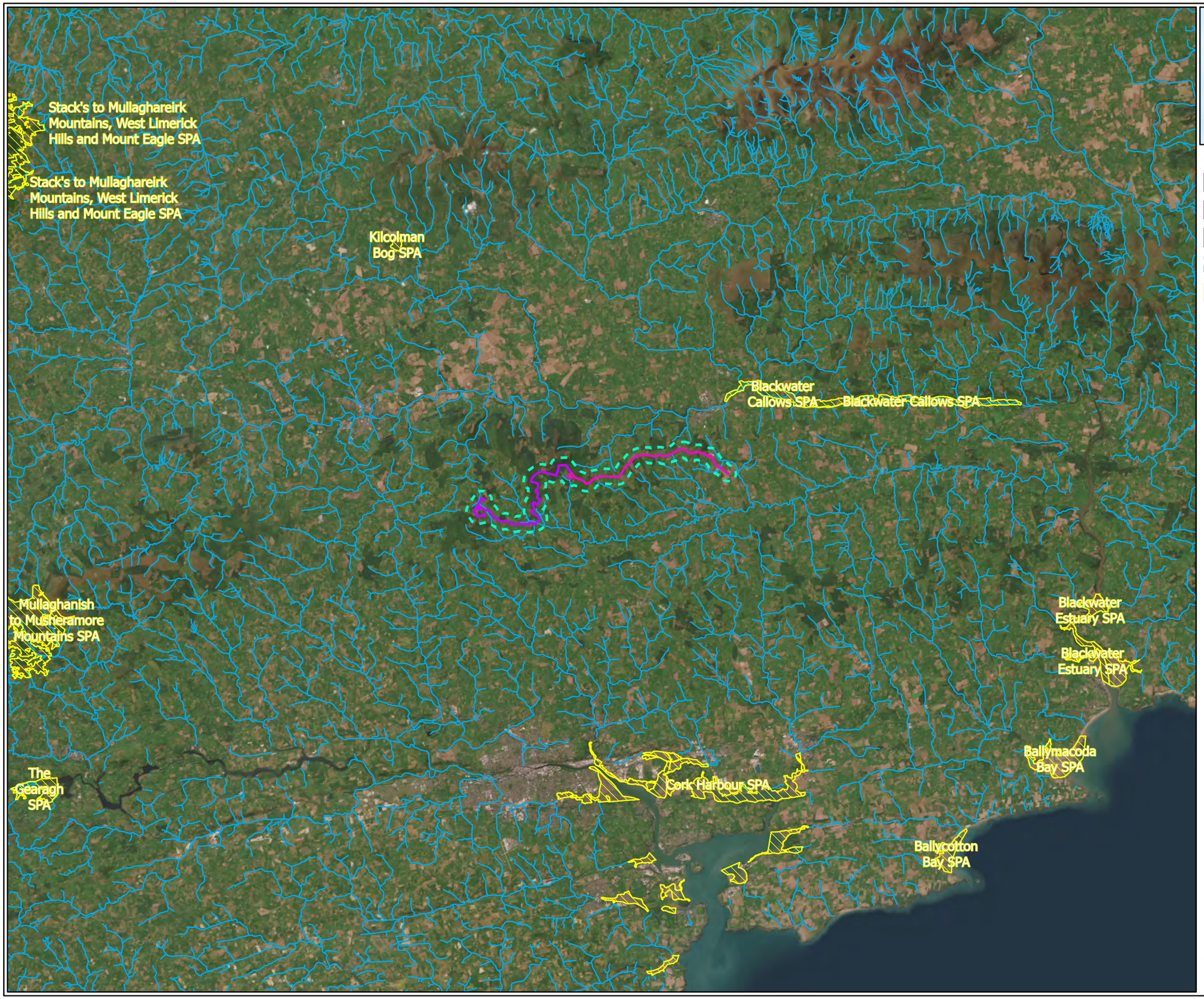
N W E S

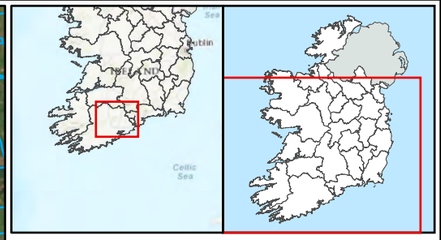
Kilometers
0 1 2 4

TITLE:	SAC's within Proximity of the Proposed Development		
PROJECT:	Coom Green Energy Park Grid Connection		
FIGURE NO:	4.1		
CLIENT:	Coom Green Energy Ltd.		
SCALE:	1:250,000	**REVISION:**	0
DATE:	20/04/2026	**PAGE SIZE:**	A3

FEHILY TIMONEY
Cork | Dublin | Carlow
www.fehilytimoney.ie

Path: R:\Map Production\2024\P24-308\Workspaces\P24_308_NIS_Figures\P24_308_NIS_Figures.aprx





Legend

- 110kV Site Boundary
- 33kV Site Boundary
- Substation Compound
- 550m
- Special Protection Areas
- Rivers

TITLE:	SPA's within Proximity of the Proposed Development		
PROJECT:	Coom Green Energy Park Grid Connection		
FIGURE NO:	4.2		
CLIENT:	Coom Green Energy Ltd.		
SCALE:	1:275,000	**REVISION:**	0
DATE:	20/04/2026	**PAGE SIZE:**	A3

FEHILY TIMONEY
Cork | Dublin | Carlow
www.fehilytimoney.ie

N W E S

Kilometers
0 1 2 4

4.4 Assessment of Likely Significant Effects

This section of the report explains the metrics used when assessing if the potential effects (previously identified) are likely to be significant on European sites.

The European sites with evident pathways for potential effects arising from the sources for impact from the Proposed Development - either alone or in combination with other projects or plans - are:

- Blackwater River (Cork/Waterford) SAC (002170);

The EC (2021) guidance document notes that assessing the significance of effects on Natura 2000 sites, the potential for effects is considered in relation to the sensitivity of habitat and species and the nature of the Proposed Development. These sites are assessed for the potential of likely significant effects through both indirect and direct pathways as well as in combination effects from existing projects and policies/plans.

The potential for the Proposed Development to have likely significant effects on the Blackwater River (Cork/Waterford) SAC (002170) is examined in Table 4-2 on the basis of the source-pathway-receptor model, and the sensitivity of the European site's qualifying interests.

- In-channel works can cause barriers for movement and fragment habitats for mobile species.
- Accidental pollution and sedimentation can impact water quality and degrade aquatic habitats downstream. This can have indirect effects on aquatic species.
- Noise, vibration and human presence during the construction phase of the Proposed Development could potentially have disturbance / displacement effect on fauna.
- The potential spread of invasive species during the proposed works.

Table 4-2: Assessment of Likely Significant Effects.

Qualifying Interest	Conservation Objective [1]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Significant Effect
Freshwater Pearl Mussel (*Margaritifera margaritifera)* [1029]	Restore favourable condition: viable population with appropriate age structure; clean, stable substrate; high water quality; suitable host fish populations maintained.	A section of the Proposed Development is located with the Munster Blackwater Freshwater Pearl Mussel, Margaritifera margaritifera catchment (a catchment of SAC populations listed in S.I. 296 of 2009). The Cregg (Stream), located 730 m north of the Proposed Development, is not identified in the SAC Conservation Objectives document (NPWS, 2012) as having suitable habitat to support this protected species, however downstream the Blackwater (River) main channel is known to host pearl mussel populations. Notwithstanding, the Proposed Development does not involve watercourse crossings of any of these waterbodies, nor was suitable habitat recorded at any watercourses during the surveys. As such, a part of the Proposed Development sits within the Pearl Mussel Catchment, however there will be no interaction with the watercourses which drain to the Blackwater River.	No
White-clawed Crayfish (*Austropotamobius pallipes*) [1092]	Maintain favourable condition: distribution and population structure maintained; good water quality, refugia and connectivity maintained.	The 'Area of Interest' referenced in the Conservation Objectives documents (NPWS, 2016) of White-clawed crayfish is upstream of the Proposed Development in the Awbeg [Buttevant] watercourse. During the aquatic survey in 2025 undertaken by Triturus Environmental Ltd, there were no records of white-clawed crayfish (both alive or as remains in otter latrine) or suitable habitat, therefore the Proposed Development does not have the potential to adversely affect this QI, in view of its Conservation Objective.	No
Sea Lamprey *(Petromyzon marinus)* [1095]	Restore favourable condition: viable population; access to spawning and nursery habitat maintained; hydrological regime and migration pathways maintained.	No suitable Sea Lamprey habitat was identified during the aquatic survey. The closest record of sea lamprey redds is 38 km downstream of the Proposed Development. Given the location, nature and scale of the Proposed Development, any water quality impacts resulting from the construction of the Proposed Development would dissipate given the extent of the water catchment and its contributing waters to the river before reaching spawning habitats for this QI.	No

[1] NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Qualifying Interest	Conservation Objective [1]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Significant Effect
Brook Lamprey (*Lampetra planeri)* [1096]	Maintain favourable condition: population distribution and suitable spawning and juvenile habitat maintained; substrate quality and flow regime maintained.	Of the sites investigated during the aquatic survey, only one (Farran North) provided good lamprey spawning habitat. A previous survey for the previously consented CGEP(2000) recorded lamprey in this watercourse. There are additional records of *Lampetra spp* further downstream (16+ km) from the Proposed Development. In-channel works can degrade aquatic habitats, which can indirectly impact these QIs. In-channel works can create barriers and fragment habitats. Therefore there is potential for the Proposed Development to adversely affect the Conservation Objectives of this Qualifying Interest	Yes
River Lamprey (Lampetra fluviatilis) [1099]	Maintain favourable condition: viable population; access to spawning and nursery habitat maintained; connectivity maintained.		
Twaite Shad (Alosa fallax) [1103]	Restore favourable condition: viable population; unobstructed migration; suitable estuarine and freshwater habitat maintained.	Given the lack of records of Twaite shad within the River Bride catchment, and the lack of suitable habitat within this catchment and that the Proposed Development is in the upper reaches of the river, there is no potential for the Proposed Development to adversely affect the Conservation Objectives of this Qualifying Interest.	No
Atlantic Salmon (Salmo salar) [1106]	Maintain favourable condition: natural range and productive capacity of freshwater habitat maintained; water quality, flow regime and fish passage maintained.	There was suitable salmonoid habitat within the Proposed Development at the crossing locations of the Proposed Development. In-stream works can lead to accidental pollution or sedimentation which can degrade aquatic habitat for salmon and in-channel works can create barriers and fragment habitats. Therefore there is potential for the Proposed Development to adversely affect the Conservation Objectives of this Qualifying Interest.	Yes
Estuaries [1130]	Maintain favourable condition: natural range and area stable or increasing; structure and function supporting typical species maintained; water quality and tidal dynamics maintained.	These Qualifying Interests are marine habitats and occur at least 49 km downstream of the Proposed Development. Given the location, nature and scale of the Proposed Development, any water quality impacts resulting from the construction of the Proposed Development would dissipate given the extent of the catchment and its water contribution at the river before reaching these habitats.	No

Qualifying Interest	Conservation Objective [1]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Significant Effect
[1140] Tidal Mudflats and Sandflats	Maintain favourable condition: natural range and area stable or increasing; sediment structure, invertebrate communities and ecological processes maintained.	Therefore, the Proposed Development does not have the potential to adversely affect these Qualifying Interests, in view of their Conservation Objectives.	No
Perennial Vegetation of Stony Banks [1220]	Maintain favourable condition: extent and stability of shingle maintained; structure and typical plant assemblages maintained.		No
Salicornia Mud [1310]	Maintain favourable condition: extent and composition of pioneer saltmarsh communities maintained; natural coastal processes maintained.		No
Atlantic Salt Meadows [1330]	Restore favourable condition: natural range and area stable or increasing; vegetation structure, zonation and transitional habitats maintained.		No
Mediterranean Salt Meadows [1410]	Maintain favourable condition: extent, species composition and saline hydrological regime maintained.		No

Qualifying Interest	Conservation Objective [1]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Significant Effect
Otter (Lutra lutra) [1355]	Restore favourable condition: distribution, habitat availability, resting sites and connectivity maintained.	Otter are known to use the River Bride, and while no resting or breeding sites were identified within the study area, activity signs downstream of the River Bride bridge were recorded. Accidental pollution or sedimentation can degrade aquatic habitats which can indirectly impact this QI. In-channel works can create barriers and fragment habitats. Additionally, artificial noise and lighting during construction can lead to disturbance. Therefore, there is potential for the Proposed Development to adversely effect this QI in view of its Conservation Objectives.	Yes
Killarney Fern (Trichomanes speciosum) [1421]	Maintain favourable condition: extent of populations and suitable shaded, humid microclimatic conditions maintained.	This is a rare terrestrial species associated with Old oak woodlands. The closest record is over 75 km away from the Proposed Development. There was no record of this species or suitable habitat within the Proposed Development. Given the distance to the nearest known population, the absence of suitable habitat and the nature of Proposed Development, there is no potential for the Proposed Development to adversely affect this QI in view of its Conservation Objectives.	No
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]	Maintain favourable condition: Habitat distribution, Habitat area, Hydrological regime, substrate composition, Water quality and characteristic aquatic vegetation maintained.	During the aquatic surveys this habitat type was not recorded, however this QI may be present downstream of the Proposed Development and is vulnerable to water quality impacts. Accidental pollution or sedimentation from in-channel works can degrade aquatic habitats and have indirect impacts, therefore the Proposed Development has the potential to adversely affect this QI in view of its Conservation Objectives.	Yes
Old Oak Woodlands [91A0]	Restore favourable condition: extent, age structure, canopy composition, deadwood and native understory maintained.	This habitat type was not recorded on site, therefore there will be no reduction in favourable condition of this QI. While the nearest occurrence of this habitat type is 20+ km downstream of the Proposed Development, this habitat is on the steep banks of the river and incised tributaries (NPWS, 2012), and there is no hydrological connectivity between this habitat and the Proposed Development. Therefore, there is no potential for the Proposed Development to adversely affect this QI in view of its Conservation Objectives.	No

Qualifying Interest	Conservation Objective [1]	Does the Proposed Development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets	Likely Significant Effect
Alluvial Forests [91E0]	Restore favourable condition: floodplain dynamics, hydrology, extent and woodland structure maintained.	This habitat type was not recorded on site. The closest occurrence of this habitat type as mapped by NPWS is on a tributary of the River Bride and is therefore not hydrologically connected to the Proposed Development. However, alluvial forests are vulnerable to water quality impacts and while not mapped, may exist downstream of the Proposed Development. Accidental pollution or sedimentation can alter water quality which can indirectly impact this QI. The spread of invasive species during construction can also impact this QI. Therefore, there is potential for the Proposed Development to adversely affect this QI in view of its Conservation Objective.	Yes

4.5 Summary of Effects

It was established that one European site, The River Blackwater (Cork/Waterford) SAC occurs within the Zone of Influence of the Proposed Development. Table 4-2 established that in the absence of mitigation, the Proposed Development is likely to have significant effects on the Qualifying Interests of the site. The Qualifying Interests are listed below:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260]
- Alluvial Forests [91E0]
- Otter *(Lutra lutra*) [1355]
- Brook Lamprey (*Lampetra planeri*) [1096]
- River Lamprey (*Lampetra fluviatilis*) [1099]
- Atlantic Salmon (*Salmo salar*) [1106]

4.6 Screening Conclusion

In accordance with Article 6(3) of the Habitats Directive, , this AA Screening Report has assessed the Proposed Development and its potential to significantly affect European sites. The assessment concludes that the Proposed Development, individually or in combination with other plans or projects, is likely to have significant effects on the Conservation Objectives of the River Blackwater (Cork/Waterford) SAC.

Therefore, this Natura Impact Statement (NIS) has been prepared to assess the implications of the Proposed Development, individually and in combination with other plans and projects, for the integrity of the River Blackwater (Cork/Waterford) SAC.

5. NATURA IMPACT STATEMENT

5.1 Introduction

The Competent Authority, in this case An Comisiún Pleanála will be required to carry out an appropriate assessment to determine whether the proposed development would adversely affect the integrity of the Blackwater River (Cork-Waterford) SAC should the proposed development proceed. The 'integrity of the site' can be defined as 'the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and / or populations of species for which the site is or will be classified'[1].

5.2 Assessment of the effects of the project or plan on the integrity of Natura 2000 Sites

This section of the report sets out the potential effects of the proposed works (either alone or in combination with other projects or plans) on the integrity of the Blackwater River (Cork Waterford) SAC with respect to the conservation objectives of the site and its structure and function. The focus is on demonstrating, with supporting evidence, that there will be no adverse effects on the integrity of the Blackwater River (Cork Waterford) SAC should the proposed development proceed. Where this is not the case, adverse effects must be assumed.

The elements of the Proposed Development that could

The Appropriate Assessment screening could not exclude the possibility of likely significant effects on the qualifying interests of the River Blackwater (Cork/Waterford) SAC. The reasoning is detailed below:

- In-channel works can create barriers for movement and fragment habitats for mobile species.
- Accidental pollution and sedimentation can impact water quality and degrade aquatic habitats downstream. This can have indirect effects on aquatic species.
- Noise, vibration and human presence during the construction phase of the Proposed Development could potentially have disturbance / displacement effect on fauna.
- The potential spread of invasive species during the proposed works.

5.2.1 Blackwater River (Cork/Waterford) SAC

The description of the Blackwater River (Cork/Waterford) SAC is quoted on the Site Synopsis (NPWS, 2016), Conservation Objectives (NPWS, 2012) and Natura 2000 Standard Data Form (NPWS, 2019a). The full site synopsis can be found in Appendix B.

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which include the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The portions of the Blackwater and its tributaries that fall within this SAC flow through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Nearby towns include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

[1029] Freshwater Pearl Mussel (Margaritifera margaritifera)
*[1092] White-clawed Crayfish (*Austropotamobius pallipes)
*[1095] Sea Lamprey (*Petromyzon marinus*)*
*[1096] Brook Lamprey (*Lampetra planeri)
*[1099] River Lamprey (*Lampetra fluviatilis)
*[1103] Twaite Shad (*Alosa fallax*)*
*[1106] Atlantic Salmon (*Salmo salar*)*
[1130] Estuaries
[1140] Tidal Mudflats and Sandflats
[1220] Perennial Vegetation of Stony Banks
[1310] Salicornia Mud
[1330] Atlantic Salt Meadows
*[1355] Otter (*Lutra lutra*)*
[1410] Mediterranean Salt Meadows
*[1421] Killarney Fern (*Trichomanes speciosum)
[3260] Floating River Vegetation
[91A0] Old Oak Woodlands
[91E0] Alluvial Forests

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, over-grazing within the woodland areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel.

Conservation objectives provided in detail in Table 5.1

5.3 Assessment of Adverse Effects on Site Integrity

In Section 4.3 of this NIS, potential likely significant adverse effects of the Proposed Development on the integrity of the River Blackwater (Cork/Waterford) SAC were identified. In accordance with EC Guidance (European Commission, 2021), the identification of these effects was focussed on and limited to the Conservation Objectives of the European sites concerned. Table 5-1 below provides a detailed analysis and evaluation of the adverse effects identified in Section 4.3.

Table 5-1: Conservation Objectives for Qualifying Interests with Potential for Adverse Effects on the Integrity of the River Blackwater (Cork/Waterford) SAC (NPWS, 2012).

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
Brook Lamprey *Lampetra planeri* River Lamprey *Lampetra fluviatilis*	To restore the favourable conservation condition of Brook/River Lamprey[2]	Distribution	% of river accessible	*Access to all water courses down to first order streams*	One site during the aquatic survey – Farran North was recognised as having suitable lamprey habitat, however, as this location will be crossed using HDD, habitat fragmentation is not anticipated as in-channel works are avoided.	N/A	There is no potential for the Proposed Development to affect these targets.
		Population structure of juveniles	Number of age/size classes	*At least three age/size groups of brook/river lamprey present*	Accidental pollution or sedimentation can degrade aquatic habitats during in-channel works and indirectly impact juvenile lamprey and reduce survival and development. Therefore there is potential for the Proposed Development to adversely effect these attributes.	Short term	There is potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects.
		Juvenile density in fine sediment	Juveniles/m²	*Mean density of brook/river larval lamprey in sites with suitable habitat more than 5/m²*			
		Extent and distribution of spawning nursery habitat	m² and occurrence	*No decline in extent and distribution of spawning and nursery beds*	One site during the aquatic survey – Farran North was recognised as having suitable lamprey habitat, however, as this location will be crossed using HDD, habitat removal of spawning and nursery beds is not anticipated. As there is no habitat removal, there is no potential for the Proposed Development to adversely effect these attributes	N/A	There is no potential for the Proposed Development to affect these targets.
		Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	*More than 50% of sample sites positive. See map 10 for recorded locations*			
Atlantic Salmon *Salmo salar*	To restore the favourable conservation condition of Salmon	Distribution: extent of anadromy	% of river accessible	*100% of river channels down to second order accessible from estuary*	In channel works are proposed at multiple locations with hydrological connectivity to the SAC, as in-channel structures can create barriers and fragment habitats, there is potential for the Proposed Development to adversely effect this attribute.	Long term	There is potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects.
		Adult spawning fish	Number	*Conservation Limit (CL) for each system consistently exceeded*	Accidental pollution or sedimentation can degrade aquatic habitats during in-channel works and indirectly impact salmon and juvenile salmon survival and development therefore there is potential for the Proposed Development to adversely affect these attributes.	Short term	There is potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects.
		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 min sampling*		Short term	There is potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects.

[2] The conservation objectives for these two species are the same

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
		Out-migrating smolt abundance	Number	No significant decline			
		Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	In-channel works at the Toor River, Field Chimney Stream and Bunnaglanna (HDD-ing and cable installation through the existing bridge at the River Bride avoid channel bed changes) can reduce and remove potential spawning redds. Therefore, there is potential for the Proposed Development to adversely effect this attribute.	Long term	There is potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects.
		Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	Accidental pollution and sedimentation can lead to changes in water quality and adversely effect this attribute.	Short term	There is potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects.
Otter *Lutra lutra*	To maintain the favourable conservation condition of Otter	Distribution	Percentage positive survey sites	No significant decline	As otter are known to use the SAC and tributaries for commuting and foraging, in-channel construction and structures can create barriers and fragment habitat. Therefore, there is potential for the Proposed Development to adversely effect this attribute.	Long term	There is potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects.
		Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 447.6 ha along river banks/ lake shoreline/around ponds	The Proposed Development avoids riparian habitat removal; therefore, this target will not be affected.	N/A	There is no potential for the Proposed Development to affect these targets.
		Extent of freshwater (river) habitat	Kilometers	No significant decline. Length mapped and calculated as 263.7 km	The Proposed Development will not result in the removal of freshwater river habitat, so there is no potential for adverse effects.	N/A	There is no potential for the Proposed Development to affect these targets.
		Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 31.6ha	The Proposed Development will not affect the extent of freshwater lake/lagoon habitat, so there is no potential for adverse effects.	N/A	There is no potential for the Proposed Development to affect these targets.
		Couching sites and holts	Number	No significant decline	No couching sites or holts were recorded within the study area of the Proposed Development. Therefore there is no potential for adverse affects.	N/A	There is no potential for the Proposed Development to affect these targets.
		Fish biomass available	Kilograms	No significant decline	Accidental pollution and sedimentation can lead to changes in water quality which can reduce prey availability for otter. Therefore, there is potential for the Proposed Development to adversely effect this attribute.	Short term	Potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects exists

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
		Barriers to connectivity	Number	No significant increase	As otter are known to use the SAC and tributaries for commuting and foraging, in-channel construction and structures can create barriers and fragment habitat. Artificial lighting and noise during construction can disturb commuting otter. Therefore, there is potential for the Proposed Development to adversely effect this attribute.	Long term	Potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects exists
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	To maintain the favourable conservation condition of Annex I habitat 3260	Distribution	Occurrence within SAC	No decline in distribution within the SAC	While this habitat type was not recorded during the aquatic survey at the crossing locations, it is assumed this habitat occurs downstream, and accidental pollution and sedimentation from in-channel works can indirectly impact this habitat. Sediments can smother aquatic vegetation and water quality changes can impact the conditions required for this habitat. Therefore, water quality impacts during the construction of the Proposed Development can impact all attributes of this QI.	Short term	Potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects exists
		Extent	Area (m^2) of habitat	No decline in habitat area			
		Structure and function – Hydrological regime	Flow characteristics (depth, velocity, natural variation)	Maintain appropriate hydrological regime			
		Structure and function – Substrate composition	Substrate type (gravel/cobble with low silt deposition)	Maintain natural substrate conditions			
		Structure and function – Water quality	Nutrient status / ecological status (WFD classification)	At least Good ecological status; no deterioration			
		Vegetation composition	Presence of characteristic species of *Ranunculion fluitantis* and Callitricho-Batrachion communities	Maintain typical species composition			
		Connectivity	Continuity of river channel	No artificial barriers or fragmentation			

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*	To restore the favourable conservation condition of Alluvial forests	Habitat area	Hectares	Area stable or increasing, subject to natural processes	Accidental pollution and sedimentation can alter nutrient levels of the water, indirectly impacting soil, hydrology which can impact species composition. This can impact the structure of the woodland, diversity and reduce the distribution and extent of this habitat type downstream of the Proposed Development. The spread of invasive species during in-channel works to this habitat can change the diversity and composition of this habitat resulting in long-term changes to the extent and area of this habitat type.	Long term	Potential for the Proposed Development to affect this target either alone or in-combination with other plans or projects exists
		Habitat distribution	Occurrence	No decline, subject to natural processes			
		Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size			
		Woodland structure: cover and height	Woodland structure: cover and height	Total canopy cover at least 30%; median canopy height at least 7m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%			
		Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types			
		Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes of target species for 91E0* woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy			
		Woodland structure: dead wood	Number per hectare	At least 19 stems/ha of dead wood of at least 20cm diameter			
		Woodland structure: veteran trees	Number per hectare	No decline			
		Woodland structure: indicators of local distinctiveness	Occurrence; population size	No decline in distribution and, in the case of redlisted and other rare or localised species, population size			
		Vegetation composition: native tree cover	Occurrence	At least 1 target species for 91E0* woodlands present; at least 6 positive indicator species for 91E0* woodlands present			

Species/Habitat	Conservation Objective	Attribute	Measure	Target	Potential for Adverse Effects on Site Integrity from the Proposed Development	Duration of Effect in the Absence of Mitigation	Conclusion
		Vegetation composition: negative indicator species	Occurrence	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent			
		Vegetation composition: problematic native species	Percentage	Cover of common nettle (*Urtica dioica*) less than 75%			
		Woodland structure: indicators of overgrazing	Occurrence	All five indicators of overgrazing absent	The Proposed Development will not increase grazing of this habitat type.	N/A	There is no potential for the Proposed Development to affect these targets.
		Hydrological regime: flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	The Proposed Development will not impact the hydrological regime of the water table.	N/A	There is no potential for the Proposed Development to affect these targets.

5.3.1 Summary of Adverse Effects on the Qualifying Interests

As outlined in Table 5-1 above, the Proposed Development has the potential to cause the following adverse effects on the Qualifying Interest of the Blackwater (Cork/Waterford) SAC:

- In-channel works can create barriers for movement and fragment habitats for mobile species.
- Accidental pollution and sedimentation can impact water quality and degrade aquatic habitats downstream. This can have indirect effects on aquatic species.
- Noise, vibration and human presence during the construction phase of the Proposed Development could potentially have disturbance / displacement effect on fauna.
- The potential spread of invasive species during the proposed works.

5.4 In-Combination Effects

Article 6(3) of the Habitats Directive requires that AA be carried out in respect of plans and projects that are likely to have adverse effects on European sites, "either individually or in combination with other plans or projects". Therefore, the combined effects of the plan or project under assessment and other past, present or foreseeable future plans or projects must also be examined, analysed and evaluated.

A review of permitted and proposed developments within the wider landscape was undertaken to assess the potential for in-combination effects on European Sites. As the potential impacts of the Proposed Development are construction phase impacts, only developments granted in the last five years that are within the same catchment as the Proposed Development and have not yet been constructed have been assessed for cumulative impacts. The results are summarised in Table 5-2.

The ongoing forestry and agricultural practices surrounding the Proposed Development have been required to comply with S.I. No. 113 of 2022 and Forestry Acts. Given these regulatory frameworks, it is considered that any cumulative impacts arising from the current operation of these existing activities, in combination with the construction of the Proposed Development will not result in adverse effects on the integrity of the Blackwater River (Cork/Waterford) SAC.

Table 5-2: Assessment of adverse effects from the Proposed Development in combination with other projects

Project	Distance	Description	Potential in-combination adverse effects
Rathcormack Housing Development 304919-19	4.1 km downstream	Construction of 23 no. dwelling houses and all associated ancillary site development works within the curtilage of a Protected Structure.	Downstream of the Proposed Development within the same catchment. This is a small-scale development and has been subject to its own AA process and Flood Risk Assessment, which concluded that there would be no adverse effects on the integrity of the River Blackwater (Cork/Waterford) SAC.
Amarenco Solar Rathcormac PL04.248278	0.8 km	Construction of a 5MW solar farm with approx 22,200 photovoltaic panels on mounted frames within area of 8.7 hectares, 2 inverter transformer stations, 1 delivery station, fencing and associated	This development was subject to its own AA process and there was no hydrological connectivity between the development and any European site.
Ballybrowney Upper 244050	4.6 km	Construction of milking parlour with all associated site works	This development was subject to its own AA process and it was concluded that there would be no adverse effects on the integrity of the River Blackwater (Cork/Waterford) SAC.
Coom Green Energy Park ABP-308885-20	0	10-year permission for the construction of up to 22 wind turbines and all related site works and ancillary development. Location Townlands of Glashaboy North, Coom (Hudson), Tooreen South, Killeagh, Coom (Fitzgerald), Knuttery, Mullenaboree, Knockacullata, Knoppoge, Carrig, Glannasack, Knockdoorty, Lackendarragh North, Glashaboy South, Toorgarrif, Castleblagh, County Cork	The CGEP wind farm and the Proposed Development are adjacent and will be constructed at the same time. The CGEP has been subject to its own AA process, which concluded there would be no adverse effects on the integrity of any European Sites. The CGEP will be constructed in accordance with a CEMP and Surface Water Management Plan.

The developments above in Table 6-2, have been subject to their own AA process and have been assigned mitigation to protect the integrity of the River Blackwater (Cork/Waterford) SAC. On this basis, it is concluded that no in-combination effects between these developments and the Proposed Development are likely to arise.

5.5 Mitigation

Mitigation is prescribed in accordance with mitigation by avoidance as a first approach. Where this is not feasible, measures to prevent impacts from giving rise to adverse effects should be adopted (e.g. management of surface water runoff). Where impacts cannot be avoided mitigation by reduction of impact is required to limit the exposure of the receptor to an acceptable level (often achieved by interrupting the pathway between the source and receptor).

Mitigation measures adhere to the following guidelines:

- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008)
- Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016).
- Guidelines For the Treatment of Otters Prior to the Construction of National Road Schemes (NRA, 2009)
- Guidelines for the Management of Noxious Weeds and Non- Native Invasive Plant Species on National Roads (NRA, 2010).
- Control of Water Pollution from Construction Sites (CIRIA C532) (CIRIA, 2010)
- Environmental Good Practice on Site Guide (CIRIA C741) (CIRIA, 2019)

The mitigation measures are listed in Section 5.5.1 – 5.5.4 in accordance with the potential project-related impacts as summarised below:

- In-channel works can cause barriers for movement and fragment habitats for mobile species.
- Accidental pollution and sedimentation can impact water quality and degrade aquatic habitats downstream. This can have indirect effects on aquatic species.
- Noise, vibration and human presence during the construction phase of the Proposed Development could potentially have disturbance / displacement effect on fauna.
- The potential spread of invasive species during the proposed works.

The mitigation detailed below in Section 5.5.1 – 5.5.4 will be undertaken alongside the mitigation outlined in the CEMP. In addition to the CEMP which outlines the implementation of the mitigation measures and environmental commitments of the Proposed Development, as well as the monitoring and supervision of these measures, and follow-up arrangements and management of any potential effects, a Surface Water Management Plan (SWMP) is provided in the CEMP and sets out the procedures and control measures required to protect surface water quality and associated aquatic ecological receptors during the construction phase. A Project Ecologist/Ecological Clerk of Works (ECoW) will be employed for the duration of the construction phase and will advise on environmental effects and communicate with the project owner and contractor to ensure the required actions to implement the mitigation are carried out. The Project Ecologist/ECoW will be awarded a level of authority permitting them to stop construction activity if there is potential for significant environmental effects.

5.5.1 Mitigation for habitat fragmentation

Mitigation measures to reduce habitat fragmentation for otter:

- For the culvert crossing on the Toor river, a mammal ledge will be provided in accordance with TII (2008). The ledges will be at least 500 mm wide and at least 150 mm above the 1 in 5-year flood event and have at least 600 mm of headroom.
- Additionally, any excavations deeper than 1m will be either covered or have ramps fitted outside of working hours, which will allow otter to escape. And any temporarily exposed open pipe system will be capped to prevent species such as otter from gaining access when contractors are off site.

Mitigation measures to reduce habitat fragmentation for salmon and lamprey

- Culverts and in-channel crossings will be designed according to IFI guidance (IFI, 2016) to allow fish passage
- Instream works will take place June-September to avoid salmon spawning.
- Channels will be reinstated to original condition and substrate and gravels will be returned to channel to recreate existing conditions and maintain suitable habitat.

5.5.2 Mitigation for the degradation in water quality and loss/damage to aquatic habitat.

Along with the water quality mitigation set out in the CEMP, the following mitigation measures are proposed during cabling works construction:

- Weather warnings will be monitored, and no construction will take place during extreme events to mitigate against potential flooding.
- Mitigation measures will be provided where surface water flows may be temporarily prevented from reaching gullies during trench excavation. Mitigation measures will include the provision of temporary over ground surface water channels using sand bagging for example to divert flows to downstream gullies.
- Trenches will be excavated during dry periods where possible in short sections and left open for minimal periods, to avoid acting as a conduit for surface water flows.
- Any excavated material will be used in the reinstatement of the cable trenches subject to approval. Surplus material will be removed from the site to an appropriate licenced facility. There will be no stockpiling of excavated material.
- All excavated soil material will be managed on site in accordance with the CEMP.
- Silt fencing will be provided around any exposed areas to prevent the ingress of suspended solids into adjacent watercourses. These mitigation measures will prevent surface water contamination and will prevent subsequent flows of contaminated water into watercourses.
- Additional protection will be provided in the form of silt fencing downslope where required during construction, to further ensure that there is no effect from the development to streams and rivers downslope of the site.
- Daily visual inspections of drains and streams will be performed during the construction period to ensure suspended solids are not entering the streams and rivers alongside the work area, to identify any obstructions to channels, and to allow for appropriate maintenance of the existing roadside drainage regime.

Mitigation measures proposed to avoid release of hydrocarbons at the Proposed Development site are as follows:

- Due to the ease of access along the grid connection route, it is unlikely that any refuelling on site will be necessary. Nevertheless, if required, storage areas will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be available to deal with any accidental spillage from plant or equipment; and
- An emergency plan for the construction phase to deal with accidental spillages is included within the CEMP. Spill kits will be available to deal with any accidental spillage in and outside the re-fuelling area.

The following mitigation measures are proposed to avoid contamination by cementitious material:

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined cement washout ponds;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

5.5.3 Mitigation for disturbance during construction

- Construction activities will be restricted to between 0800 – 1900, which avoids disturbance to otter.
- A pre-construction survey for otter holts will be undertaken 2-3 weeks prior to construction as otter could establish holts within 150 m of the watercourse crossings between the time of the initial survey and construction.

5.5.4 Mitigation for the spread of invasive species

- A pre-construction survey to reconfirm the presence of invasives during the growing season immediately prior to the construction phase by qualified ecologists. This will mark out the extent/likely extent of the invasive plant material to create a construction buffer zone.
- A licensed invasive species contractor shall be engaged to remove invasive plant species prior to development.
- New sightings of the invasive plant species identified at the proposed site shall be relayed to the contractor for invasive species control. These areas shall follow the same protocol as the current infected areas.
- All staff shall be made aware of nature of threat via toolbox talks as part of site inductions.

5.5.4.1 Invasive Species Management Plan

This Invasive Species Management sets out the procedures for the containment, excavation, handling and disposal of Himalayan knotweed within the proposed works area.

All works will be undertaken in accordance with best practice guidance and under the supervision of a suitably qualified ECoW with specialist knowledge in invasive species removal.

Prior to the commencement of any excavation works, a designated 'knotweed contamination zone' will be established.

- This will extend 50 m east and west of the crossing location and infestation.
- Within this zone, a 15 m buffer on either side of the infestation will be established as a controlled working and brush off area.
- The contamination zone will be fenced using Heras fencing, with clear signage stating 'Invasive Species Contamination Zone – No Unauthorised Entry"
- The 15 m will be lined with Terram liner, with a thin layer of clean gravel. This will be the designated brush off and contamination platform.

All handing and excavation will be undertaken with full supervision of the ECoW. ECoW will

- Confirm the extent of the infestation prior to excavation
- Confirm the depth and extent of the excavation
- Ensure the excavation extends an additional 300 mm beyond last visible rhizome
- Check the footwear and clothing of operatives working near invasive species for rhizomes, seeds, fruits, or other viable material before exiting the site. Such operatives will also use boot brushes prior to exiting the site.
- Examine all vehicles exiting the area of knotweed infestation to prevent the transport of seeds/rhizomes/plant material.

During the excavation of the infestation, measures to minimise disturbance and prevent cross contamination will include:

- A long reach excavator will operate from the western bank, and the dumper will operate from the eastern side. This will ensure there is no turning or tracking of contaminated machinery across clean ground and to prevent soil spill on to clean ground.
- The dumper will be fitted with heras fencing and terram wrap to prevent spillage of contaminated soils
- Excavator wheels/tracks will be fitted with heras fencing and terram wrap to precent soil spillage from the bucket

Upon completion of the excavation, the following will be adhered to:

- All heras fencing and terram liner attached to machinery will be carefully removed and brushed down in the contamination zone
- The excavator bucket will be brushed down in the contamination zone
- Dumper wheels will be rotated through a full wheel cycle and brushed clean to ensure no remaining material is lodged
- A final inspection by ECoW before any machinery leave the zone.

The handling and disposal of excavated material in the dumper will be securely covered and transported off site by an appropriately licensed waste contractor and disposed of properly at a suitably licenced facility, in accordance with the (NRA, 2010) guidelines.

This removal will be undertaken during the dry work phase of the in-channel construction. During this,

- All equipment associated with the in-channel works (pumps, generator etc) will be treated as contaminated
- Equipment will be brushed down in the designated contamination zone prior to the removal from the contamination zone.
- The in-channel works will be carried out with ECoW supervision to ensure no rhizomes remain.

The smaller infestation adjacent to the drainage ditch will require fencing for the duration of the construction of the Proposed Development and be clearly marked as exclusion zones. The removal of the fencing will be undertaken with ECoW supervision to ensure no contaminated material stick to the fencing prior to the removal from site. Periodic re-surveying (as determined by the ECoW) for all invasive species will be required, to ensure that treatment measures were effective, and to trigger further treatment if necessary.

As part of the routine maintenance of the operation of the Proposed Development, control measures will be implemented along the drainage ditch to ensure there is no re-establishment. Due to the potential for significant negative effects on the aquatic environment from herbicides, spot treatment will be applied with herbicide approved by DAFM.

5.6 Conclusion

For the reasons set out in detail in this NIS, in the light of the best scientific knowledge in the field, all aspects of the Proposed Development which, by itself, or in combination with other plans or projects, may affect the River Blackwater (Cork/Waterford) SAC have been assessed and it has been concluded that the Proposed Development will not adversely affect the integrity of any relevant European site in view of that site's conservation objectives.

The NIS contains information which the competent authority may consider in making its own complete, precise and definitive findings and conclusions and upon which it is capable of determining that all reasonable scientific doubt has been removed as to the effects of the Proposed Development on the integrity of the River Blackwater (Cork/Waterford) SAC.

Taking cognisance of measures incorporated into the project design and mitigation measures to avoid effects that are considered in the preceding section, the Proposed Development will not adversely affect the integrity of the River Blackwater (Cork/Waterford) SAC, alone or in-combination with other plans or projects.

6. REFERENCES

Department of Housing, Planning, and Local Government- EIA Portal

Environment Heritage and Local Government. (2009, updated 2010). *Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities*. Dublin

Environmental Protection Agency (EPA) - https://gis.epa.ie/EPAMaps/ (accessed (07/11/23)

European Commission (2000) Communication from the Commission on the Precautionary Principle. Luxembourg.

European Commission. (2002). *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 Communities.

European Commission. (2013). *Interpretation Manual of European Union Habitats*. EUR 28.

European Commission. (2019). Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC.

European Commission. (2021). 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 (Issue 2021/C 437/01).

European Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive).

Fossitt, J. A. (2000). A guide to habitats in Ireland. Heritage Council/Chomhairle Oidhreachta.

Inland Fisheries Ireland. (2016). *Guidelines on the protection of fish during construction works*.

Kruuk, H. (1992). Scent marking by otters (*Lutra lutra)*: signaling the use of resources. Behavioral Ecology, 3(2), 133-140.

NatureScot. (2021). *Disturbance distances review: An updated literature review of disturbance distances of selected bird species* (NatureScot Research Report 1283). NatureScot

National Biodiversity Data Centre Maps - Biodiversity Maps (biodiversityireland.ie) (accessed 21/03/2025)

National Parks and Wildlife Service – online European site network information, including site conservation objectives (accessed 07/11/23)

National Parks and Wildlife Service – Information on the status of EU protected habitats and species in Ireland (including Article 17 and Article 12 Reports)

NPWS (2019) The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS Report.

National Parks and Wildlife Service. (2012). *Conservation objectives: Blackwater River (Cork/Waterford) SAC (Site Code 002170)* (Version 1.0). Department of Arts, Heritage and the Gaeltacht.

NRA (2008). Guidelines for the Treatment of Otters Prior to the Construction of National Road. National Roads Authority (name has since changed to Transport Infrastructure Ireland), Ireland.

Office of the Planning Regulator. (2021). OPR *Practice Note PN01. Appropriate Assessment Screening for Development Management.*

Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013a). National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Reid, N., Thompson, D., Hayden, B., Marnell, F., & Montgomery, W. I. (2013a). Review and quantitative meta-analysis of diet suggests the Eurasian otter (Lutra lutra) is likely to be a poor bioindicator. Ecological indicators, 26, 5-13.

Scottish Natural Heritage. (2016). *Assessing Connectivity with Special Protection Areas (SPAs) Guidance*.

FEHILY TIMONEY

DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

APPENDIX A

Aquatic Report

Aquatic baseline report for grid connection of the proposed Coom Green Energy Park, Co. Cork

Prepared by Triturus Environmental Ltd. for Fehily Timoney

May 2025

Please cite as:

Triturus (2025). Aquatic baseline report for the grid connection of the proposed Coom Green Energy Park, Co. Cork. Report prepared by Triturus Environmental Ltd. for Fehily Timoney. May 2025.

Table of contents

1. Introduction

1.1 Background

Triturus Environmental Ltd. were commissioned by Fehily Timoney to conduct baseline aquatic surveys to inform EIAR preparation for the grid connection of the proposed Coom Green Energy Park (GEP) development located near Bottlehill, Co. Cork (**Figure 2.1**).

Undertaken on a catchment-wide scale, this report provides a baseline assessment of the aquatic ecology including fisheries and biological water quality, as well as protected species and habitats in the vicinity of watercourse crossings and alignment of the proposed grid connection route (GCR) options. Aquatic surveys were undertaken in April 2025.

1.2 Development description

A full description of the proposed development is provided in the Environmental Impact Assessment Report (EIAR) used to support consenting applications.

2. Methodology

2.1 Selection of watercourses for assessment

All freshwater watercourses which could be affected directly or indirectly by the proposed GCR options were considered as part of the current assessment. The focus was on proposed watercourse crossings but consideration was also given to watercourses in close proximity (<30m) to the GCR alignment(s). Thus, a total of *n*=14 sites were selected for detailed aquatic assessment (see **Table 2.1, Figure 2.1 & 2.2** below). The courses and nomenclature for the watercourses surveyed followed Environmental Protection Agency (EPA) mapping.

Riverine survey sites were present on the Shanowen Trib 1 Stream (EPA code: 18S42), Farran North Stream (18F27), Toor River (18T51), River Bride (18B05), Field Chimney Stream (18F43) and an unmapped stream, Bunnaglanna Stream (18B07) and the Red Bog Stream (18R48) (**Table 2.1**). A number of proposed watercourse crossings were located within the Blackwater River (Cork/Waterford) SAC (002170), a site designated for a range of aquatic qualifying interest species and habitats (NPWS, 2012).

Please note this aquatic report should be read in conjunction with the final Environmental Impact Assessment Report (EIAR) prepared for the proposed development.

2.2 Aquatic site surveys

Aquatic surveys were conducted on the 14th, 15th and 30th April 2025. Survey effort focused on both instream and riparian habitats at each aquatic sampling location and included a fisheries habitat appraisal, white-clawed crayfish survey, macrophyte and aquatic bryophyte survey and biological water quality sampling (Q-sampling) (**Figure 2.1**). This holistic approach informed the overall aquatic ecological evaluation of each site/watercourse in context of the proposed development and ensured that any habitats and species of high conservation value would be detected to best inform mitigation.

In addition to the ecological characteristics of the site, a broad aquatic and riparian habitat assessment was conducted utilising elements of the methodology given in the Environment Agency's 'River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003' (EA, 2003) and the Irish Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000). This broad characterisation helped define the watercourses' conformity or departure from naturalness. All sites were assessed in terms of:

- Physical watercourse/waterbody characteristics (i.e. width, depth, channel form) including associated evidence of historical drainage
- Substrate type and relative condition, listing substrate fractions in order of dominance (i.e. bedrock, boulder, cobble, gravel, sand, silt etc.)
- Flow type by proportion of riffle, glide and pool in the sampling area
- An appraisal of the macrophyte and aquatic bryophyte community at each site
- Riparian vegetation composition and bordering land use practices

Table 2.1 Location of *n=14* aquatic survey sites along proposed grid connection options

Site no.	Watercourse	EPA code	Location	X (ITM)	Y (ITM)
1b	Shanowen Trib 1 Stream	18S42	Ballynahina	582020	594310
1a	Farran North River	18F27	Farran North	578458	595312
3a / 4a	Toor River	18T51	Coom	564137	591664
3b	Toor River	18T51	Coom	564713	591156
3c	River Bride	18B05	Killeagh	567903	590355
3d	Field Chimney Stream	18F43	Glannasack	568214	591694
3e	Unmapped stream	n/a	Glannasack	568893	592309
3f	Bunnaglanna Stream	18B07	Moneygorm	570827	593361
4b	Toor River	18T51	Coom	564769	591020
4c	Red Bog Stream	18R48	Coom	566375	590073
4d	River Bride	18B05	Killeagh	567959	590327
X1	River Bride	18B05	Bride Bridge	568364	590215
4e	Field Chimney Stream	18F43	Glannasack	568157	592192
4f	Bunnaglanna Stream	18B07	Knockdoorty	570064	594407

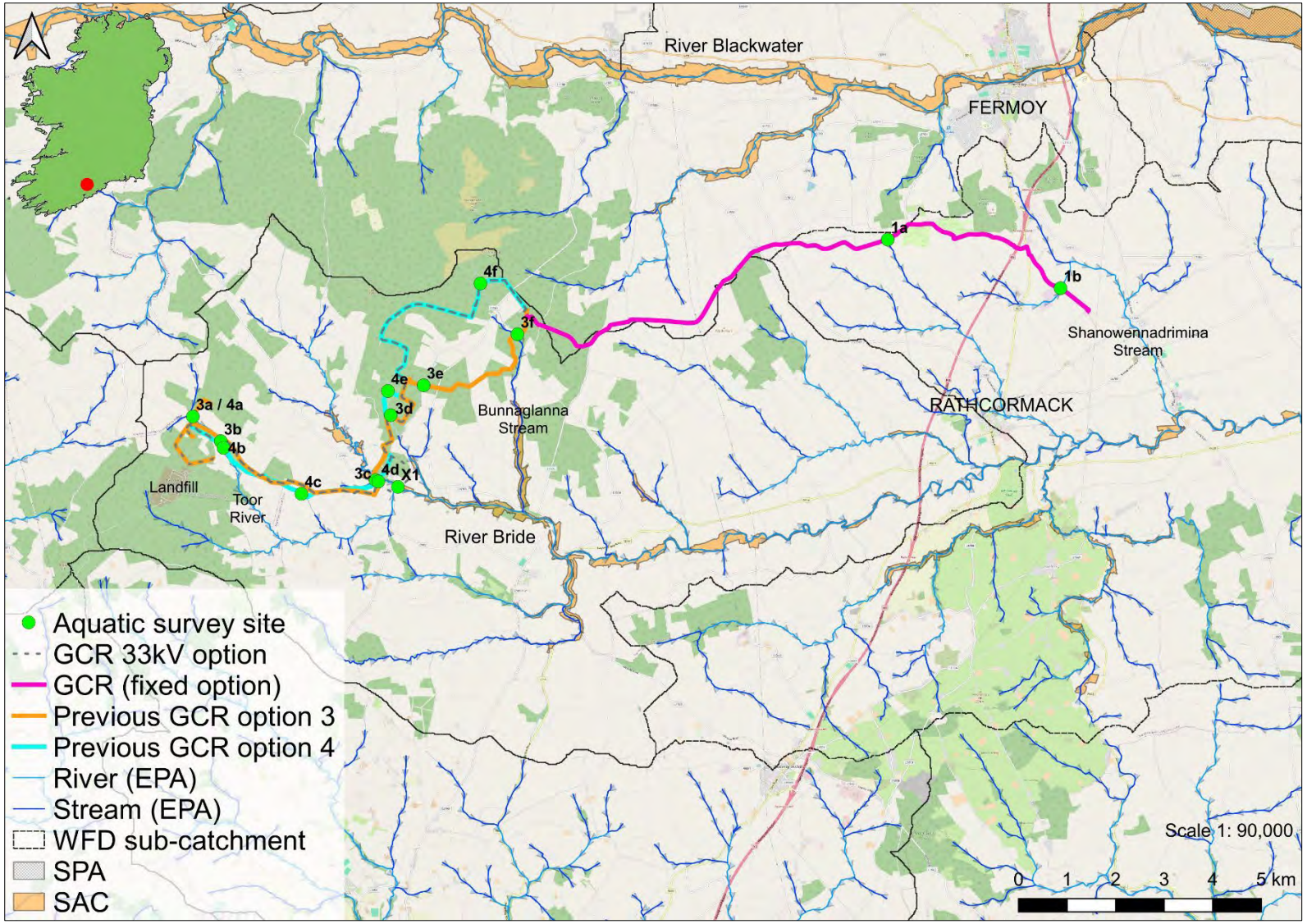


Figure 2.1 Overview of the Coom GEP GCR watercourse crossing aquatic survey sites, April 2025

2.3 Fisheries habitat appraisal

A fisheries habitat appraisal of 14 no. sites was undertaken to establish their importance for salmonid, lamprey, European eel and other fish species. The appraisal surveys focused on evaluating the spawning, nursery and or holding habitat for salmonids and lamprey species but also considered European eel and other fish species. The appraisals of salmonids and lamprey were cognisant of species-specific habitat requirements and preferences as outlined in O'Grady (2006), Hendry et al. (2003), Armstrong et al. (2003), Harvey & Cowx (2003), Maitland (2003) and Hendry & Cragg-Hine (1997). River habitat surveys and fisheries assessments were also carried out utilising elements of the approaches in the River Habitat Survey Methodology (EA, 2003) and Fishery Assessment Methodology (O'Grady, 2006) to broadly characterise the riverine sites (i.e. channel profile, substrata etc.).

2.4 White-clawed crayfish survey

White-clawed crayfish (*Austropotamobius pallipes*) surveys were undertaken at the aquatic survey sites in April 2025 under a National Parks and Wildlife (NPWS) open national licence as prescribed by Sections 9, 23 and 34 of the Wildlife Act (1976-2023), to capture and release crayfish to their site of capture. As per Inland Fisheries Ireland aquatic biosecurity recommendations, the crayfish sampling started at the uppermost site(s) of the Green Energy Park catchment/sub-catchments in the survey area to minimise the risk of transfer invasive propagules (including crayfish plague) in an upstream direction.

Hand-searching of instream refugia and sweep netting was undertaken according to Reynolds et al. (2010). An appraisal of white-clawed crayfish habitat at each site was conducted based on physical habitat attributes (Gammell et al., 2021; Peay, 2003), water chemistry and incidental records in mustelid spraint. Additionally, a desktop review of crayfish records within the wider survey area was completed.

2.5 Biological water quality (Q-sampling)

The 14 no. riverine survey sites were assessed for biological water quality through Q-sampling in April 2025 (**Table 2.1**). All samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glide utilising a 2-minute kick sample, as per Environmental Protection Authority (EPA) methodology (Feeley et al., 2020). Large cobble was also washed at each site for 1-minute (where present) to collect attached macro-invertebrates (as per Feeley et al., 2020). Samples were elutriated and fixed in 70% ethanol for subsequent laboratory identification to species level. Samples were converted to Q-ratings as per Toner et al. (2005) and assigned to WFD status classes (**Table 2.2**). Any rare invertebrate species were identified from the NPWS Red List publications for beetles (Foster et al., 2009), mayflies (Kelly-Quinn & Regan, 2012), stoneflies (Feeley et al., 2020) and other relevant taxa (i.e. Byrne et al., 2009; Nelson et al., 2011).

Table 2.2 Reference categories for EPA Q-ratings (Q1 to Q5) (Toner et al., 2005)

Q value	WFD status	Pollution status	Condition
Q5 or Q4-5	High status	Unpolluted	Satisfactory
Q4	Good status	Unpolluted	Satisfactory
Q3-4	Moderate status	Slightly polluted	Unsatisfactory
Q3 or Q2-3	Poor status	Moderately polluted	Unsatisfactory
Q2, Q1-2 or Q1	Bad status	Seriously polluted	Unsatisfactory

2.6 Macrophytes and aquatic bryophytes

Surveys of the macrophyte and aquatic bryophyte community were conducted by instream wading at each of the survey sites, with specimens collected (by hand or via grapnel) for on-site identification. An assessment of the aquatic vegetation community helped to identify any rare macrophyte species listed under the Flora (Protection) Order, 2022, Irish Red list for vascular plants (Wyse-Jackson et al., 2016) and or aquatic bryophytes (Lockhart et al., 2012), or habitats corresponding to the Annex I habitats, e.g., 'Water courses of plain to montane levels, with submerged or floating vegetation of the *Ranunculion fluitantis* and *Callitricho-Batrachion* (low water level during summer) or aquatic mosses [3260]' (more commonly referred to as 'floating river vegetation').

2.7 Otter signs

The presence of otter (*Lutra lutra*) was determined through the recording of otter signs within 150m radius of each survey site. Notes on the age and location of signs (ITM coordinates) were made, in addition to the quantity and visible constituents of spraint (i.e. remains of fish, crustaceans, molluscs etc.).

2.8 Aquatic ecological evaluation

The evaluation of aquatic ecological receptors contained within this report uses the geographic scale and criteria defined in the 'Guidelines for Assessment of Ecological Impacts of National Road Schemes' (NRA, 2009).

2.9 Biosecurity

A strict biosecurity protocol following IFI (2010) and the Check-Clean-Dry approach was adhered to during surveys for all equipment and PPE used. Disinfection of all equipment and PPE before and after use with Virkon™ was conducted to prevent the transfer of pathogens or invasive propagules between survey sites. Surveys were undertaken at sites in a downstream order to minimise the risk of upstream propagule mobilisation. Where feasible, equipment was also thoroughly dried (through UV exposure) between survey areas. Any aquatic invasive species or pathogens recorded within or adjoining the survey areas were geo-referenced. All Triturus staff are certified in 'Good fieldwork practice: slowing the spread of invasive non-native species' by the University of Leeds.

3. Desktop review

3.1 Survey area description

The proposed GCR options are located in a mostly upland area near Bottlehill south-west of Fermoy, Co. Cork. The proposed routes are within hydrometric area 18 (Blackwater (Munster), with proposed crossings located in the Bride[Waterford]_SC_010 and Bride[Waterford]_SC_020 river sub-catchments. The watercourses crossed by the Coom Green Energy Park GCR options are typically small upland channels (FW1; Fossitt, 2000) which flow over areas of old red sandstone, sandstone, conglomerate & mudstone (Geological Survey of Ireland data). Land use practices in the wider survey area are dominated by coniferous forestry (CORINE 312) with extensive adjoining areas of pasture (231).

3.2 Fisheries

The River (Waterford) Bride, the major watercourse within the survey area, is known to support Atlantic salmon (*Salmo salar*), brown/sea trout (*Salmo trutta*), lamprey (*Lampetra* sp.), European eel (*Anguilla anguilla*) and stone loach (*Barbatula barbatula*) (Triturus data; Matson et al., 2019; Kelly et al., 2013). The Bride river system has been ranked 26th in the country in terms of the quantity of accessible fluvial habitat (for salmon and sea trout) available, representing 0.78% of the national total (McGinnity et al., 2003).

The Toor River, a tributary of the Bride, and the Field Chimney Stream both support Atlantic salmon, brown trout and European eel (Triturus data; Matson et al., 2019).

The Farran North River, a tributary of the Shanowennadrimina Stream, is known to support Atlantic salmon, brown trout, lamprey (*Lampetra* sp.), European eel and three-spined stickleback (*Gasterosteus aculeatus*) (Triturus 2020 data).

Previous surveys of the Shanowen Trib 1 Stream at the proposed GCR crossing failed to capture any fish (Triturus 2020 data).

3.3 Protected and rare aquatic species

A comprehensive desktop review of available data from the National Parks and Wildlife Service (NPWS), National Biodiversity Data Centre (NBDC), Inland Fisheries Ireland (IFI), Botanical Society of Britain and Ireland (BSBI), National Crayfish Plague Surveillance Programme (NCPSP), Environmental Protection Agency (EPA) and Triturus databases for the 10km grid squares containing and adjoining the development (i.e. W68, W69, W79 & W89) identified a low number of records for rare and or protected aquatic species within the vicinity of the proposed GCR options.

Annex II otter (*Lutra lutra*) records were widespread throughout the respective grid squares (**Figure 3.1**). Records were available for the River Bride, including at Bride Bridge (site X1) (NPWS & Triturus data). A record was also available for the Inchinanagh River, a tributary of the River Bride, within the wider survey area (Triturus data).

Numerous records for Annex II freshwater pearl mussel (*Margaritifera margaritifera*) were available

for the W69, W79 and W89 grid squares but all were confined to the River Blackwater. No records overlapped with the survey area. Similarly, Annex II white-clawed crayfish (*Austropotamobius pallipes*) records were available for the River Blackwater and the Ballyclogh Stream (upper tributary upstream of Mallow, W59) but no records overlapped with the survey area.

Numerous sea lamprey (*Petromyzon marinus*) records were available for the Munster Blackwater catchment (e.g. River Blackwater, Clyda River) but no records overlapped with the survey area. River lamprey (*Lampetra fluviatilis*) records were available for the River Blackwater and the lower River Bride at Rathcormack Bridge (not within survey area).

No contemporary NPWS records for macrophytes or aquatic bryophytes protected under the Flora (Protection) Order, 2022 were available for the respective grid squares.

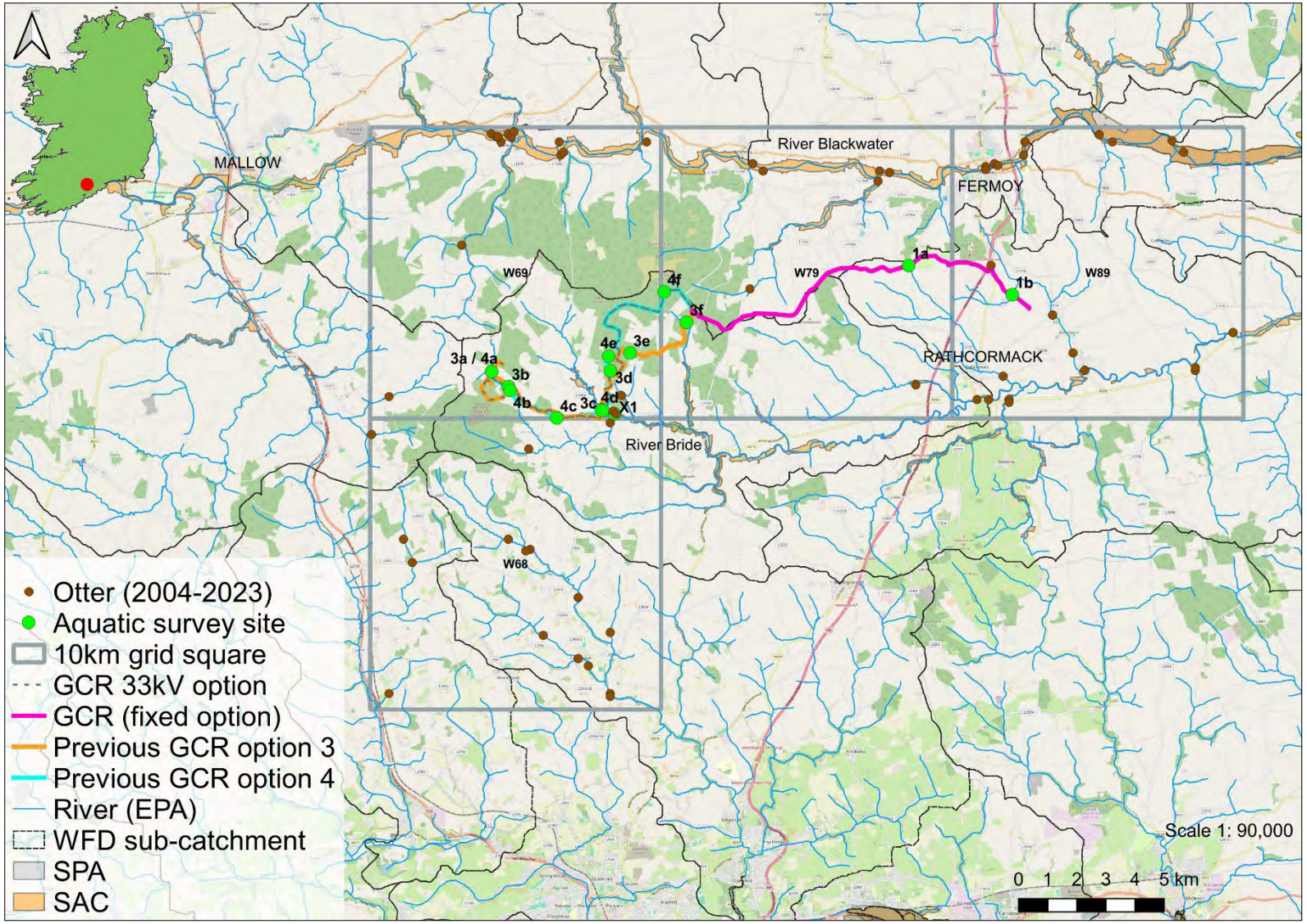


Figure 3.1 Selected protected aquatic species records in the vicinity of the proposed GCR options (source: Triturus, NPWS & NBDC data)

4. Results of aquatic surveys

The following section summarises each of the 14 no. survey sites in terms of aquatic habitats, physical characteristics and overall value for fish and macrophyte/aquatic bryophyte communities. Biological water quality (Q-sample) results are summarised for each sampling site and in **Appendix A**. A summary of the aquatic species and habitats of high conservation concern recorded during the surveys is provided in **Table 4.1**. An evaluation of the aquatic ecological importance of each survey site based on these aquatic surveys is provided and summarised in **Table 4.2**. Habitat codes are according to Fossitt (2000). Scientific names are provided at first mention only. Sites were surveyed in April 2025.

4.1 Aquatic survey site results

4.1.1 Site 1a – Shanowen Trib 1 Stream, Ballynahina

Site A1 was located on the Shanowen Trib 1 Stream (EPA code: 18S42), a tributary of the Shanowen River, at a proposed GCR crossing. The small lowland depositing stream (FW2) had been historically straightened and locally straightened resulting in a homogenous channel 1m wide with 1m high banks. The stream suffered from low flows at the time of survey and was 0.05m deep with a profile of very shallow slow-flowing riffle. The bed comprised heavily bedded and silted small boulder, cobbles and gravels with some low rates of siltation. The site supported occasional water mint (*Mentha aquatica*) with the liverwort *Riccardia chamedryfolia* present on instream cobble. The riparian areas featured mature hawthorn (*Crataegus monogyna*), gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus* agg.) adjoining improved pasture (GA1).

Located in the uppermost reaches of the watercourse, the site was too small and shallow to support resident fish. Low flow volumes further reduced its fisheries and white-clawed crayfish potential. Previous surveys of the site failed to recorded fish species via electro-fishing (Triturus 2020 data). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the absence of aquatic species or habitats of higher conservation value, the aquatic ecological evaluation of site 1a was of **local importance (lower value) (Table 4.2).**

Plate 4.1 Representative image of site 1a on the Shanowen Trib 1 Stream, April 2025

4.1.2 Site 1b – Farran North River, Farran North

Site A2 was located on the Farran North River (18F27), a tributary of the Shanowennadrimina Stream, at a proposed GCR crossing. The lowland channel (FW2) had been heavily modified historically and was 1.5-2m wide with 1.5-2m high banks. The site was 0.2-0.8m deep with a profile dominated by deeper glide with localised pool. The bed comprised mixed boulder, cobble and gravels with deep beds of silt in depositing pool habitat. Primarily due to siltation but also riparian shading, macrophytes and aquatic bryophytes were absent. The riparian areas supported scattered mature beech (*Fagus sylvatica*), grey willow (*Salix cinerea* sp. *oleifolia*), ash (*Fraxinus excelsior*) and hawthorn with pockets of invasive Himalayan balsam (*Impatiens glandulifera*) along the verges. The site was bordered by intensive pasture (GA1) with a sawmill upstream.

Site 1b was of good value for salmonids, despite siltation pressures, with mixed cohort salmonids observed in pools during the site visit. Whilst spawning and nursery habitat was compromised and of moderate value only, deeper glide and pool (with overhanging vegetation) provided good holding opportunities for adult salmonids and also European eel refugia. Abundant silt deposits provided good quality lamprey ammocoete (nursery) habitat. Atlantic salmon, brown trout, lamprey (*Lampetra* sp.), European eel and three-spined stickleback have been recorded from the site previously (Triturus 2020 data). Despite some suitability (i.e. rocky refugia and deeper water) no white-clawed crayfish were recorded. No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given suitability for and the known presence of salmonids (including Atlantic salmon), lamprey (*Lampetra* sp.) and European eel (Triturus 2020 data), the aquatic ecological evaluation of site 1b was of **local importance (higher value) (Table 4.2).**

Plate 4.2 Representative image of site 1b on the Farran North River, April 2025

Plate 4.3 Example of lamprey ammocoete habitat at site 1b on the Farran North River, April 2025

4.1.3 Site 3a / 4a – Toor River, Coom

Site 3a / 4a (same location) was located on the upper reaches of the Toor River (18T51) at a proposed GCR crossing. The small upland channel (FW1) had been historically straightened through a coniferous plantation (WD4) and improved pasture (GA1). The river was 1.5-2m wide and 0.1-0.4m deep with 1m bank heights. The profile was of deep glide and riffle with very localised pool. The bed comprised boulders, cobble, mixed gravels and sand. These were moderately silted with substrata being moderately bedded. Bank erosion, inclusive of livestock poaching, was widespread. The small river supported no macrophytes due to its high energy. However, instream sandstone boulders supported the moss species *Rhynchostegium riparioides*. The riparian areas were predominantly open pasture with pockets of species-poor wet grassland (GS4) and or bordered by semi-mature sitka spruce (WD4).

Site 3a / 4a was a good quality nursery for salmonids and a small population of mixed cohort brown trout was observed. These were also captured during kick sampling (**Plate 4.5**). The presence of mixed boulder, cobble and gravels with broken flow patterns (i.e. oxygenated riffle-glide) provided good salmonid nursery conditions. The small river also had moderate eel suitability given the presence of abundant rocky refugia and ample depth, despite being located in poorer access (higher gradient) reaches of the sub-catchment. The site was of too high energy to support lamprey and no suitable habitat was observed. The sandstone geology of the Toor River was unsuitable for white-clawed crayfish and none were recorded. No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4-5 (high status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the suitability for and confirmed presence of salmonids, the aquatic ecological evaluation of site 3a / 4a was of **local importance (higher value) (Table 4.2).**

Plate 4.4 Representative image of site 3a / 4a (same location) on the Toor River, April 2025

Plate 4.5 Juvenile brown trout recorded via kick sampling at site 3a / 4a on the Toor River, April 2025

4.1.4 Site 3b – Toor River, Coom

Site 3b was located on the upper reaches of the Toor River (18T51) at a proposed GCR crossing approximately 0.8km downstream of site 3a/4a. The small upland river channel (FW1) had been historically deepened but retained good sinuosity with a profile of deep glide and riffle and localised shallow pool on meanders. The river was 1.5-2m wide and 0.1-0.5m deep with 1m high banks. The bed comprised boulder, cobble and mixed gravels but these were heavily silted with the substrata being moderately bedded. This was mainly due to unfenced cattle access to the small river upstream (poaching) where significant volumes of eroded silt was entering the river. Water-crowfoot (*Ranunculus* sp.) was occasional instream. Larger instream boulders supported locally frequent *Fontinalis antipyretica*. The channel margins supported occasional marsh marigold (*Caltha palustris*) and hemlock water-dropwort (*Oenanthe crocata*). The riparian areas featured frequent scattered grey willow, gorse and bramble. Wet hollows in the adjoining willows supported tussock sedge (*Carex paniculata*), soft rush (*Juncus effusus*), hemlock water dropwort, marsh marigold and hairy bittercress (*Cardamine hirsuta*). The site was bordered by improved pasture (GA1) and coniferous afforestation (WD4).

Site 3b was a good quality habitat for salmonids and a small population of mixed cohort brown trout was observed. A young-of-the-year (0+) trout was also captured during kick sampling. The site provided only moderate salmonid nursery conditions given evident siltation pressures but localised pools offered valuable holding areas for adults. The small river also had moderate eel suitability given the presence of abundant rocky refugia and ample depth, despite being located in poorer access (higher gradient) reaches of the sub-catchment. The site was of too high energy to support lamprey and no suitable habitat was observed. There was no suitability for white-clawed crayfish (unsuitable catchment geology). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4-5 (high status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the suitability for and confirmed presence of salmonids, the aquatic ecological evaluation of site 3b was of **local importance (higher value) (Table 4.2).**

Plate 4.6 Representative image of site 3b on the Toor River, April 2025

4.1.5 Site 3c – River Bride, Killeagh

Site 3c was located on the upper reaches of the River Bride (18B05) at a previously proposed GCR crossing (route option 3). The upland eroding river (FW1) featured a semi-natural meandering profile with a profile dominated by shallow riffle and glide with localised pools. The river was 3-4m wide and 0.1-0.4m deep with bank heights of up to 1.2m. The bed comprised small boulder, cobble and mixed gravels. However, the substrata were heavily silted and moderately bedded. The site supported occasional hemlock water-dropwort and water crowfoot (*Ranunculus* sp.). Instream boulders supported occasional *Fontinalis antipyretica*. The riparian areas featured scattered grey willow, gorse, bramble and scattered elder (*Sambucus nigra*). The site was bordered by often dense scrub (WS1), improved pasture (GA1) and coniferous afforestation (WD4).

Site 3c was a moderate quality salmonid nursery habitat with medium densities of mixed cohort salmonids observed. A recently emerged 0+ Atlantic salmon was recorded during kick sampling (**Plate 4.8**). The presence of mixed boulder, cobble and gravels with local broken flow patterns (i.e. oxygenated riffle-glide) provided moderate quality spawning and nursery conditions. However, the value was compromised by high siltation pressures. Holding habitat for adult salmonids was moderate given a paucity of deeper pools (this improved downstream). The site was also considered a moderate quality eel nursery habitat given the presence of abundant rocky refugia and ample depth. The site

was of too high energy for lamprey despite some compacted beds of superficial silt being present. There was no suitability for white-clawed crayfish (unsuitable catchment geology). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4-5 (high status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the location of the site within the Blackwater River (Cork/Waterford) SAC (002170), the aquatic ecological evaluation of site 3c was of **international importance (Table 4.2).**

Plate 4.7 Representative image of site 3c on the River Bride, April 2025

Plate 4.8 Recently emerged Atlantic salmon fry (0+) recorded via kick sampling at site 3c on the River Bride, April 2025

4.1.6 Site 3d – Field Chimney Stream, Glannasack

Site 3d was located on the upper reaches of the Field Chimney Stream (18F43), a tributary of the Inchinanagh River, at a proposed GCR crossing. The sinuous upland channel (FW1) was of very high energy, flowing over a moderate gradient with exposed sandstone boulder cascades. The stream was 2-3m wide and 0.1-0.3m deep with steep banks that graded into the adjoining V-shaped valley. The stream had a profile of shallow cascading riffle and glide with localised plunge pools. The bed comprised of rounded boulder, cobble, mixed gravels and sand. The substrata had light to moderate siltation with the substrata being moderately bedded. The site did not support macrophytes given high energies and shading. However, instream boulders supported the liverwort *Chiloscyphus polyanthos* in shaded pockets with more frequent *Rhynchostegium riparioides* on exposed boulder tops. The riparian areas supported frequent grey willow that bordered mature Sitka spruce (*Picea* sitchensis) from the adjoining plantations (WD4).

Site 3d was a moderate quality nursery for salmonids and a small population of mixed cohort brown trout was observed. Atlantic salmon are also known from the site (Triturus 2020 data). The presence of mixed boulder, cobble and gravels with broken flow patterns (i.e. oxygenated riffle-glide) provided good nursery conditions (improving from site 4e upstream) despite the high gradient of the channel. Good quality spawning habitat was present locally in pockets of lower gradient glide between cascading areas. The broadleaved buffer (grey willow) evidently benefited the salmonid value of the stream. The site also had moderate eel suitability given the presence of abundant rocky refugia, despite being located in poorer access (higher gradient) reaches of the sub-catchment. The site was of too high energy to support lamprey and no suitable habitat was observed. There was no suitability for white-clawed crayfish (unsuitable catchment geology). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4 (good status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the suitability for and confirmed presence of salmonids, the aquatic ecological evaluation of site 3d was of **local importance (higher value) (Table 4.2).**

Plate 4.9 Representative image of site 3d on the Field Chimney Stream, April 2025

4.1.7 Site 3e – unmapped stream, Glannasack

Site 3e was located on an unmapped tributary of the Inchinanagh River at a previously proposed GCR crossing (route option 3). The small upland eroding stream (FW1) had been historically deepened and straightened through coniferous afforestation (WD4) resulting in a 0.5-1m wide channel with 1m bank heights. The shallow stream was 0.05m deep at the time of survey with a profile of very shallow riffle and glide. The channel evidently suffered from low dry weather flows. The bed comprised localised heavily bedded boulder and cobble with finer mixed gravels and sand. These were moderately silted and had high cover of the liverwort *Chiloscyphus polyanthos*. The site did not support any macrophytes due to high riparian shading. The channel was heavily shaded by grey willow and beech (*Fagus sylvatica*) that formed a buffer between adjoining Sitka spruce plantations.

The small stream was not of fisheries value at this location due to poor flows and very poor bed condition (heavily siltation & compaction of bed). There was no suitability for white-clawed crayfish (unsuitable catchment geology). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4-5 (high status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the absence of aquatic species or habitats of higher conservation value, the aquatic ecological evaluation of site 3e was of **local importance (lower value) (Table 4.2).**

Plate 4.10 Representative image of site 3e on an unmapped tributary of the Inchinanagh River, April 2025

4.1.8 Site 3f – Bunnaglanna Stream, Moneygorm

Site 3f was located on the upper reaches of the Bunnaglanna Stream (18B07), a tributary of the River Bride, at a previously proposed GCR crossing (route option 3). The upland eroding channel (FW1) flowed over a high gradient with a semi-natural, meandering from through mature sitka spruce plantations. The stream was 3-4m wide and 0.1-0.3m deep. The flow profile was of mixed cascading riffle, glide and pool sequences. The bed supported large rounded boulder and cobble with mixed gravels in interstitial spaces. The large stream was of too high energy to support macrophytes at this location. However, the liverwort species *Chiloscyphus polyanthos* was present locally on stable boulders. The riparian areas supported mature grey willow, bramble and gorse that formed a dense layer for c. 10m either side of the channel. The site was bordered by coniferous afforestation (WD4).

Site 3f was of some value for salmonids, with low numbers of mixed cohort brown trout observed in deeper pool (holding) areas during the site visit. Salmonid spawning habitat was present but limited due to high bed mobility. Good quality nursery habitat was present throughout the site. The site had moderate eel suitability given the presence of abundant rocky refugia and ample depth, despite being located in poorer access (higher gradient) reaches of the sub-catchment. The site was of too high energy to support lamprey. There was no suitability for white-clawed crayfish (unsuitable catchment geology). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4-5 (high status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than ‘least concern’, according to national red lists, were recorded via Q-sampling.

Given the suitability for and confirmed presence of salmonids, the aquatic ecological evaluation of site 3f was of **local importance (higher value) (Table 4.2).**

Plate 4.11 Representative image of site 3f on the Bunnaglanna Stream, April 2025

4.1.9 Site 4b – Toor River, Coom

Site 4b was located on the upper reaches of the Toor River (18T51) at a previously proposed GCR crossing (route option 4) approximately 0.15km downstream of site 3b. The small upland river channel (FW1) had been historically deepened but retained good sinuosity with a profile of deep glide and localised riffle. The river was 1.5-2m wide and 0.1-0.5m deep with 1-1.2m high banks. The bed comprised boulder, cobble and mixed gravels but these were heavily silted with the substrata being moderately bedded. The site supported locally frequent hemlock water-dropwort Larger instream boulders supported occasional *Fontinalis antipyretica* with the exposed and eroded muddy banks support the liverwort *Pellia epiphylla*. The mature scrubby riparian areas featured frequent scattered grey willow, gorse and bramble with sedges and rushes in wetter areas. The site was bordered by a local road (to the south), scrub (WS1), improved pasture (GA1) and coniferous afforestation (WD4).

Site 4b was a moderate quality nursery for salmonids and a small population of mixed cohort brown trout was observed. The site provided only moderate salmonid nursery conditions given evident siltation pressures. The paucity of holding pool areas reduced the value for adult salmonids. The site had moderate eel suitability given the presence of abundant rocky refugia, despite being located in poorer access (higher gradient) reaches of the sub-catchment. The site was of too high energy to support lamprey and no suitable habitat was observed. There was no suitability for white-clawed crayfish (unsuitable catchment geology). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4-5 (high status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national

red lists, were recorded via Q-sampling.

Given the suitability for and confirmed presence of salmonids, the aquatic ecological evaluation of site 4b was of **local importance (higher value) (Table 4.2).**

Plate 4.12 Representative image of site 4b on the Toor River, April 2025

4.1.10 Site 4c – Red Bog Stream, Coom

Site 4c was located on the Red Bog Stream (18R48) in close proximity (<10m) to the previously proposed GCR option 4. The small Coom River tributary had been historically deepened and straightened through coniferous afforestation (WD4) and improved pasture (GA1). The small upland stream (FW1) was 0.5-1m wide and <0.2m deep with 1.5m bank heights. The profile comprised very shallow riffle and glide. The channel evidently suffered from low dry weather flows. The substrata were dominated by boulder and cobble with heavily mixed gravels. These were heavily silted and bedded with high cover of flocculant iron-oxidising bacterial films. The site did not support macrophytes due to heavy shading. The riparian zones supported frequent grey willow, gorse and bramble scrub (WS1). The site was bordered by improved pasture (GA1) and mature scrub buffers with coniferous afforestation upstream (WD4).

The small stream was not of fisheries value at this location due to poor flows and very poor bed condition (heavily siltation & compaction of bed with high cover of iron-oxidising bacteria). There was no suitability for white-clawed crayfish (unsuitable catchment geology). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4 (good status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the absence of aquatic species or habitats of higher conservation value, the aquatic ecological evaluation of site 4c was of **local importance (lower value) (Table 4.2).**

Plate 4.13 Representative image of site 4c on the Red Bog Stream, April 2025

4.1.11 Site 4d – River Bride, Killeagh

Site 4d was located on the upper reaches of the River Bride (18B05) at a proposed GCR crossing approximately c.100m downstream of site 3c. The medium-sized upland river (FW1) featured a semi-natural meandering profile dominated by shallow riffle and glide with localised deeper pool. The river was 4m wide and 0.1-0.7m deep with 0.5-1.2m bank heights. The bed comprised small boulder, cobble, mixed gravels and silt. The instream bed substrata were moderately silted and bedded. The increase in gradient locally did not facilitate the settling of fines. The site supported occasional hemlock water-dropwort and water crowfoot (*Ranunculus* sp.). Instream boulders supported occasional *Fontinalis antipyretica*. The moss *Leptodictyum riparium* was recorded as rare (a species indicative of enrichment pressures). The riparian supported frequent grey willow, gorse, and bramble with occasional alder (*Alnus glutinosa*). The site was bordered by often dense scrub (WS1), improved pasture (GA1) and coniferous afforestation (WD4).

Site 4d was a good quality nursery habitat for Atlantic salmon and brown trout (both observed). The presence of mixed boulder, cobble and gravels with local broken flow patterns (i.e. oxygenated riffle-glide) provided improved nursery conditions (despite siltation pressures). Deeper pools provided valuable holding areas for adult salmonids. Spawning habitat quality was good locally in pools where well sorted gravels were present despite siltation pressures. The River Bride at this location was considered a moderate quality eel nursery habitat given the presence of abundant rocky refugia and ample depth. The site was of too high energy for lamprey despite some compacted beds of superficial silt being present. There was no suitability for white-clawed crayfish (unsuitable catchment geology). A regular otter latrine was identified on a willow tree root system immediately downstream of the

bridge (ITM 567955, 590311; **Plate 4.15**).

Biological water quality, based on Q-sampling, was calculated as **Q4-5 (high status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the location of the site within the Blackwater River (Cork/Waterford) SAC (002170), the aquatic ecological evaluation of site 4d was of **international importance (Table 4.2).**

Plate 4.14 Representative image of site 4d on the River Bride, April 2025

Plate 4.15 Location of regular otter latrine on willow tree root at site 4d on the River Bride, April 2025

4.1.12 Site X1 – River Bride, Bride Bridge

Site X1 was located on the River Bride (18B01) at Bride Bridge, a proposed GCR crossing (33kV option), upstream of its confluence with the Coom River. The natural upland watercourse (FW1) flowed over exposed bedrock resulting in deep pools between bedrock cascades. The river was 6-10m wide and 0.1-0.6m deep with gently sloping, well-vegetated banks. The substrata were dominated by bedrock with frequent cobble and mixed gravels. Boulders were scattered. Filamentous algae cover was high (c.70% of the bed), indicative of enrichment pressures. However, siltation was low given the high energy nature of the channel. Given high flow rates, macrophytes were scarce with only localised water crowfoot (*Ranunuclus* sp.) and hemlock water dropwort. Instream boulders also supported occasional bryophytes including *Rhynchostegium riparioides* and *Fontinalis squamosa*. The wet riparian areas were dominated by willow (*Salix* spp.) and hawthorn (*Crataegus monogyna*) with occasional iris (*Iris psuedacorus*). The site was bordered by improved pasture (GA1) and coniferous afforestation (WD4) with mature scrubby buffers.

Site X1 was of high value for salmonids, with the large pool immediately below the bridge providing excellent holding opportunities for adult fish. Riparian shading significantly improved the holding habitat providing cover and thermal shading. Salmonid spawning and nursery habitat quality was good locally but the frequency and extent of such habitat improved significantly downstream of the Coom River confluence (where riffle and glide sequences were present in addition to mixed cobble gravel substrata). Both Atlantic salmon and brown trout are known from the site (Triturus 2020 data). European eel habitat was of moderate quality given presence of deeper pools, however, instream refugia were sparse. The site was of too high energy for lamprey despite some mixed spawning gravels being present. There was no suitability for white-clawed crayfish (unsuitable catchment geology). An otter spraint site was recorded on a small marginal boulder under the bridge (ITM 568360, 590217).

Biological water quality, based on Q-sampling, was calculated as **Q4-5 (high status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the location of the site within the Blackwater River (Cork/Waterford) SAC (002170), the aquatic ecological evaluation of site X1 was of **international importance (Table 4.2).**

Plate 4.16 Representative image of site X1 on the River Bride, April 2025 (downstream of bridge)

4.1.13 Site 4e – Field Chimney Stream, Glannasack

Site 4e was located on the upper reaches of the Field Chimney Stream (30L49) at a previously proposed GCR crossing (route option 4), c.0.5km upstream of site 3d. The very high energy upland eroding channel (FW1) cascaded over beds of exposed sandstone boulder and cobble, following a sinuous profile through the adjoining conifer plantations. The stream was 2-3m wide and 0.1-0.3m with steep banks that graded into the adjoining V-shaped valley. The flow profile was of shallow cascading riffle, glide and pool. The bed comprised rounded boulder, cobble, mixed gravels and sand. The substrata featured light to moderate siltation with the substrata being moderately bedded. The channel did not support macrophytes due to high energy and shading. Instream boulders supported the liverwort *Chiloscyphus polyanthos* in shaded pool pockets with more frequent *Rhynchostegium riparioides* on exposed boulder tops. The riparian areas featured scattered grey willow that formed buffers along mature lodgepole pine (*Pinus contorta*) plantations (WD4).

Site 4e was a moderate quality nursery for salmonids and low numbers of mixed cohort brown trout were observed in pool areas. The site provided moderate nursery conditions despite the high gradient of the channel. Spawning habitat was very localised in pool habitat (given the high energy). The site also had moderate eel suitability given the presence of abundant rocky refugia, despite being located in poorer access (higher gradient) reaches of the sub-catchment. The site was of too high energy to support lamprey. There was no suitability for white-clawed crayfish (unsuitable catchment geology). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4-5 (high status)** (**Appendix A**). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the suitability for and confirmed presence of salmonids, the aquatic ecological evaluation of site 4e was of **local importance (higher value) (Table 4.2).**

Plate 4.17 Representative image of site 4e on the Field Chimney Stream, April 2025

4.1.14 Site 4f – Bunnaglanna Stream, Knockdoorty

Site 4f was located on the uppermost reaches of the Bunnaglanna Stream (18B07), a tributary of the River Bride, at a previously proposed GCR crossing c.1.5km upstream of site 3f. The upland stream (FW1) flowed over a steep gradient in a deeply incised natural valley. The meandering channel was 1-2m wide and 0.1-0.2m deep with a profile of mixed cascading riffle, pool and glide sequences. The stream suffered from low flows at the time of survey. The substrata were dominated by angular boulder and coble with frequent areas of mixed gravel and sands. Areas of bedrock were present locally. The high energy site did not support macrophytes but the liverworts *Chiloscyphus polyanthos* and *Scapania undulata* grew on instream small boulders. The often steep banks supported mature grey willow for c. 5m either side of the channel which provided valuable buffers against the adjoining coniferous afforestation (WF4) and clear-fell (WS5) areas.

The stream at site 4f was considered too shallow and high gradient to support salmonid populations. The low flows (likely an annual occurrence[1]) would further reduce to the fisheries potential of the site (located in the uppermost reaches of the watercourse). However, fisheries value improved downstream with salmonids observed at survey site 3f. The site was of too high energy to support lamprey. There was no suitability for white-clawed crayfish (unsuitable catchment geology). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q4 (good status)** (**Appendix A**). No

[1] supported by very high densities of Glossosomatidae caddis that proliferate in streams that suffer from low seasonal flows

macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the absence of aquatic species or habitats of higher conservation value, the aquatic ecological evaluation of site 4f was of **local importance (lower value) (Table 4.2).**

Plate 4.18 Representative image of site 4f on the Bunnaglanna Stream, April 2025

4.2 White-clawed crayfish survey

No white-clawed crayfish were recorded via hand-searching or sweep netting of instream refugia at any of the aquatic survey sites in April 2025. Furthermore, inspection of mustelid spraint at 2 no. sites on the River Bride did not reveal the presence of crayfish remains.

The results are in keeping with the absence of records for the species in the survey area (nearest record is the River Blackwater at Fermoy) and this is largely reflective of unsuitable water chemistry and habitats in the survey area (Demers et al., 2005; Lucy & McGarrigle, 1987).

4.3 Biological water quality (macro-invertebrates)

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality samples taken from a total of 14 no. riverine sites in April 2025 (**Appendix A**).

A total of 9 no. sites on the Toor River (3a/4a, 3b, 4b), River Bride (3c, 4d, X1), unnamed stream (3e), Bunnaglanna Stream (3f) and the Field Chimney Stream (4e) achieved **Q4-5 (high status)** water quality and thus met the target good status (≥Q4) requirements of the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 and the Water Framework Directive (2000/60/EC) (**Figure 4.1**). This intermediate rating between Q4 and Q5 was given the presence of at least one group A Heptageniidae (mayfly) species plus ≥3 Plecoptera (stonefly) species in fair numbers (5% of total abundance). These included the mayflies Ecdyonurus dispar and Rhithrogena semicolorata

in addition to stoneflies such as *Siphonoperla torrentium*, *Amphinemura sulcicollis*, *Protonemura meyeri*, *Dinocras cephalotes*, *Isoperla grammatica* and or *Brachyptera risi*. The high status ratings were in spite of some observed siltation pressures at the sampling sites.

Sites 3d on the Field Chimney Stream, 4c on the Red Bog Stream and 4f on the Bunnaglanna Stream achieved **Q4 (good status)** water quality given the presence of at least one group A taxa in fair numbers (**Appendix A**).

The remaining two sites on the Shanowen Trib 1 Stream (1a) and Farran North River (1b) achieved **Q3 (poor status)** based on an absence of group A species, low numbers of group B species and a dominance of group C species, particularly the mayfly *Baetis rhodani* and the freshwater shrimp (*Gammarus duebeni*) (**Appendix A**).

Plate 4.19 Example of the EPA group A stonefly *Dinocras cephalotes* recorded at site 4d on the River Bride, April 2025

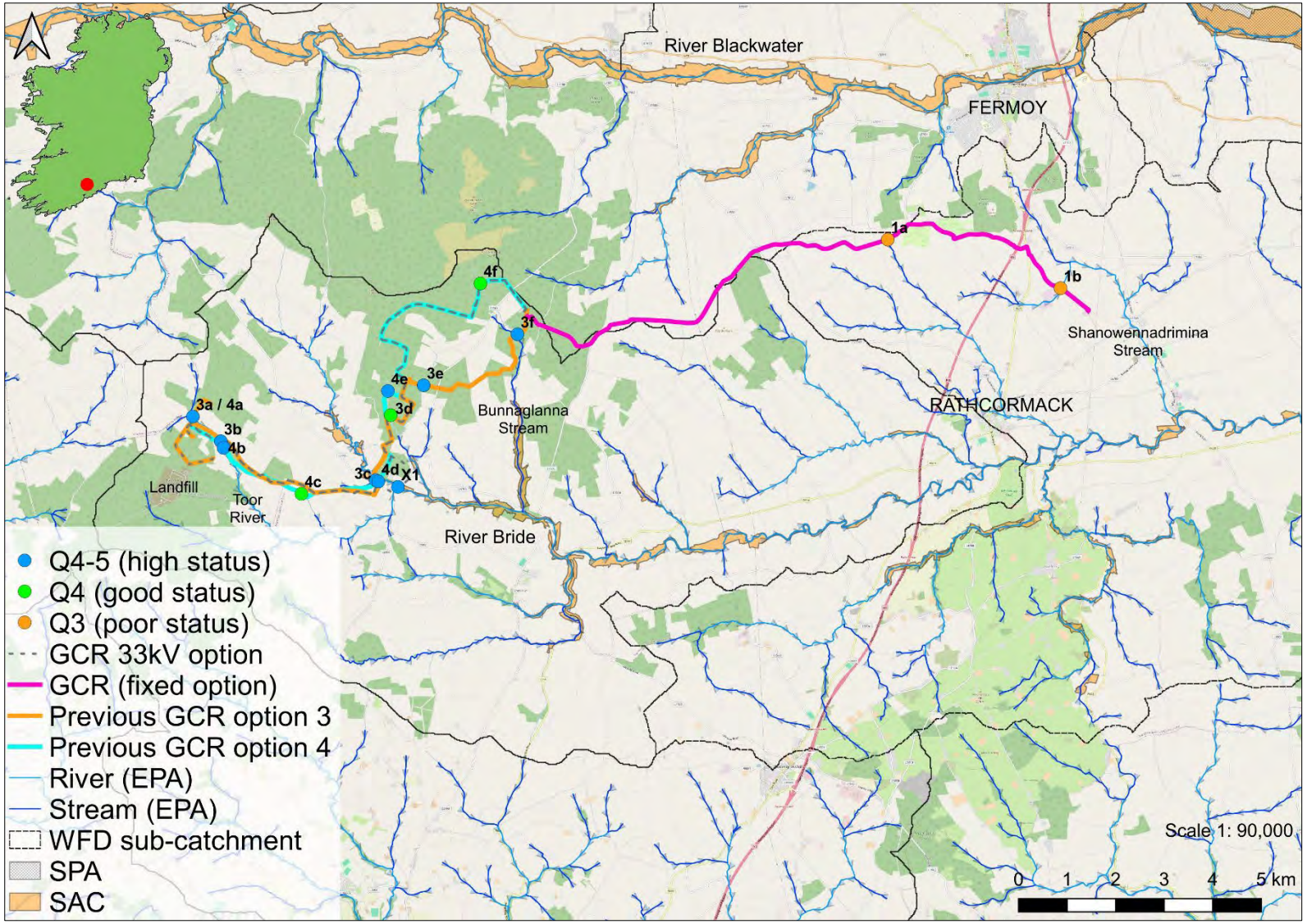


Figure 4.1 Overview of the biological water quality status in the vicinity of the proposed GCR options, April 2025

Table 4.1 Summary of aquatic species and habitats of higher conservation value recorded in the vicinity of the proposed development, April 2025

Site	Watercourse	White-clawed crayfish	Otter signs[2]	Annex I aquatic habitats	Rare or protected macrophytes/ aquatic bryophytes	Rare or protected macro-invertebrates	Other species/habitats of high conservation value
1a	Shanowen Trib 1 Stream	None recorded	No signs recorded	Not present	None recorded	None recorded	None recorded
1b	Farran North River	None recorded	No signs recorded	Not present	None recorded	None recorded	**Atlantic salmon, *Lampetra* sp. & European eel known from site (Triturus 2020 data)**
3a / 4a	Toor River	None recorded	No signs recorded	Not present	None recorded	None recorded	None recorded
3b	Toor River	None recorded	No signs recorded	Not present	None recorded	None recorded	None recorded
3c	River Bride	None recorded	No signs recorded	Not present	None recorded	None recorded	**0+ Atlantic salmon recorded via kick sampling**
3d	Field Chimney Stream	None recorded	No signs recorded	Not present	None recorded	None recorded	**Atlantic salmon known from site (Triturus 2020 data)**
3e	Unmapped stream	None recorded	No signs recorded	Not present	None recorded	None recorded	None recorded
3f	Bunnaglanna Stream	None recorded	No signs recorded	Not present	None recorded	None recorded	None recorded
4b	Toor River	None recorded	No signs recorded	Not present	None recorded	None recorded	None recorded
4c	Red Bog Stream	None recorded	No signs recorded	Not present	None recorded	None recorded	None recorded
4d	River Bride	None recorded	**Regular latrine site**	Not present	None recorded	None recorded	**Atlantic salmon parr observed**
X1	River Bride	None recorded	**Regular spraint site**	Not present	None recorded	None recorded	**Atlantic salmon parr observed**
4e	Field Chimney Stream	None recorded	No signs recorded	Not present	None recorded	None recorded	None recorded
4f	Bunnaglanna Stream	None recorded	No signs recorded	Not present	None recorded	None recorded	None recorded

Conservation value: Eurasian otter (*Lutra lutra*), Atlantic salmon (*Salmo salar*) & lamprey (*Lampetra* spp.) are listed under Annex II and Annex V of the Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) ('EU Habitats Directive'). Atlantic salmon and otter are both protected under the Irish Wildlife Acts 1976-2023. Atlantic salmon are also protected under the Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations. European eel are 'critically endangered' according to most recent ICUN red list (Pike et al., 2020) and listed as 'critically engendered' in Ireland (King et al., 2011).

[2] Otter signs within 150m of the survey site

Table 4.2 Aquatic ecological evaluation summary of the survey sites according to NRA (2009) criteria

Site no.	Watercourse	EPA code	Evaluation of importance	Rationale summary
1a	Shanowen Trib 1 Stream	18S42	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality
1b	Farran North River	18F27	**Local importance (higher value)**	Atlantic salmon, lamprey (*Lampetra* sp.) & European eel known from site (Triturus 2020 data)
3a / 4a	Toor River	18T51	**Local importance (higher value)**	Salmonids observed
3b	Toor River	18T51	**Local importance (higher value)**	Salmonids observed
3c	River Bride	18B05	**International importance**	Located within Blackwater River (Cork/Waterford) SAC (002170)
3d	Field Chimney Stream	18F43	**Local importance (higher value)**	Salmonids observed; Atlantic salmon known from site (Triturus 2020 data)
3e	Unmapped stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q4-5 (high) status water quality
3f	Bunnaglanna Stream	18B07	**Local importance (higher value)**	Salmonids observed
4b	Toor River	18T51	**Local importance (higher value)**	Salmonids observed
4c	Red Bog Stream	18R48	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q4 (good) status water quality
4d	River Bride	18B05	**International importance**	Located within Blackwater River (Cork/Waterford) SAC (002170)
X1	River Bride	18B05	**International importance**	Located within Blackwater River (Cork/Waterford) SAC (002170)
4e	Field Chimney Stream	18F43	**Local importance (higher value)**	Salmonids observed
4f	Bunnaglanna Stream	18B07	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q4 (good) status water quality

Conservation value: Atlantic salmon (*Salmo salar*) & lamprey (*Lampetra* spp.) are listed under Annex II and Annex V of the Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) ('EU Habitats Directive'). Atlantic salmon are also protected under the Irish Wildlife Acts 1976-2023 and the Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations. Apart from the Inland Fisheries Acts 1959 to 2017, non-anadromous brown trout have no legal protection in Ireland. European eel are 'critically endangered' according to most recent ICUN red list (Pike et al., 2020) and listed as 'critically engendered' in Ireland (King et al., 2011).

5. Discussion

The watercourses crossed by proposed grid connection route (GCR) options as part of the Coom Green Energy Park development were typically small upland and higher gradient channels Whilst some local modifications had occurred historically (e.g. near conifer plantations) the survey channels retained natural or semi-natural profiles. Despite evidence of water quality pressures (siltation), biological water quality was typically of ≥Q4 (good status) throughout much of the survey area, with the majority of sites achieving Q4-5 (high status) water quality in April 2025.

A number of high conservation value aquatic species were recorded or are at least known from the survey area based on previous survey data, including Atlantic salmon, lamprey (*Lampetra* sp.), otter and Red-listed European eel. This resulted in most sites being evaluated as **local importance (higher value)** in terms of their aquatic ecology (**Table 4.2**). Sites 3c, 4d and X1 on the River Bride were of **international importance** given their location within the Blackwater River (Cork/Waterford) SAC (002170), a site designated for a range of aquatic interests including Atlantic salmon, lamprey, white-clawed crayfish, otter and floating river vegetation habitat (NPWS, 2012). No examples of white-clawed crayfish or Annex I floating river vegetation were recorded at the survey sites.

Broadly speaking, the highest value watercourses in terms of aquatic ecology were the River Bride (mostly located Blackwater River (Cork/Waterford) SAC), Field Chimney Stream and the Toor River.

5.1 Fisheries

Salmonid populations were observed across the survey area. Whilst smaller channels such as the Toor River likely only support brown trout populations, Atlantic salmon are known from the River Bride, Field Chimney Stream and the Farran North River in vicinity of proposed GCR crossings. Particularly good quality salmonid spawning and nursery habitat was present on the upper River Bride, a regionally important salmonid watercourse (McGinnity et al., 2003). A recently emerged 0+ Atlantic salmon was captured during kick sampling at site 3c on this watercourse (**Plate 4.8**), supporting previous survey data as to its nursery value.

Suitability for lamprey (*Lampetra* sp.) was poor or absent at most survey sites by virtue of higher natural gradients and higher flow velocities. Such characteristics reduce the extent of fine gravels required for spawning (Dawson et al., 2015; Rooney et al., 2013; Lasne et al., 2010) and discourages the deposition of fine, organic-rich sediment ≥5cm in depth generally required by larval *Lampetra* spp. settlement (Aronsuu & Virkkala, 2014; Goodwin et al., 2008; Gardiner, 2003). However, silt deposits at site 1b on the Farran North Stream are known to support *Lampetra* sp. ammocoetes (Triturus 2020 data).

European eel are Red-listed in Ireland (King et al., 2011) and are classed as 'critically endangered' on a global scale (Pike et al., 2020). Most survey sites provided at least moderate quality eel habitat, with ample instream refugia such as boulders and deeper pool areas required by the species. Nevertheless, eel densities are likely low (at best) in the vicinity of the proposed GCR crossings, reflecting the high energy/spate nature of many watercourses in addition to other natural characteristics including high gradients and small channel width/depth. Eel penetration into the upper reaches of catchments is often low, especially where higher natural gradients result in higher flow velocities, reduced accessibility and sub-optimal eel habitats (Matondo et al., 2021; Laffaille et al., 2003). Abundance

naturally decreases with gradient and distance from marine habitats (Degerman et al., 2019), with a greater frequency of eel typically found in the lower gradient reaches of watercourses (Moriarty, 2003).

5.2 Otter

Despite suitability at many survey sites in terms of prey resources (e.g. salmonids), otter signs (spraint sites or latrines) were only recorded at 2 no. sites during the current survey. Both were on the River Bride (sites 4d & X1), where previous otter records existed (including at Bride Bridge, site X1). Otters are also known to utilise the Inchinanagh River, to which the unmapped stream at site 3e connects (**Figure 3.1**) and are listed as a qualifying interest of the Blackwater River (Cork/Waterford) SAC (002170) with which a number of survey watercourses share hydrological connectivity. No breeding (holts) or resting (couch) areas were identified in the vicinity of the GCR crossing survey sites in April 2025.

Otter occurrence is negatively associated with elevation (Triturus data; Hong et al., 2020) with smaller, upland, higher-gradient watercourses often providing more restricted, stochastic prey resources and reduced foraging opportunities for otter compared with lower-gradient, larger watercourses (Sittenthaler et al., 2019; Scorpio et al., 2016; Remonti et al., 2009). This likely explains the paucity of signs recorded during the current survey and is supported by previous surveys in the upper River Bride catchment.

5.3 Biological water quality & pressures

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality samples taken from a total of 14 no. riverine sites in April 2025 (**Appendix A**), i.e. none of greater than Least Concern.

However, **Q4-5 (high status)** water quality was widespread in the survey area, being present at 9 of the 14 no. sites in total on the Toor River (3a/4a, 3b, 4b), River Bride (3c, 4d, X1), unnamed stream (3e), Bunnaglanna Stream (3f) and the Field Chimney Stream (4e). High status waterbodies continue to decline significantly in Ireland (Trodd et al., 2022) and thus these watercourses require strict protection in light of proposed GCR (and wind farm) works that can result in water quality impacts through siltation, enrichment and or hydrocarbons. Although the Bride[Waterford]_SC_010 and SC_020 sub-catchments containing the proposed GCR options achieved good status in the 2016-2021 period (EPA data), site observations would suggest that nutrient enrichment (eutrophication) and siltation originating from land use pressures (e.g. agriculture, afforestation) pose a risk to water quality in the wider area.

6. References

Armstrong, J. D., Kemp, P. S., Kennedy, G. J. A., Ladle, M., & Milner, N. J. (2003). Habitat requirements of Atlantic salmon and brown trout in rivers and streams. Fisheries research, 62(2), 143-170.

Byrne, A. W., Moorkens, E. A., Anderson, R., Killeen, I. J., & Regan, E. (2009). Ireland Red List no. 2: Non-marine molluscs. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government.

CEN (2003). Water Quality - Sampling of Fish with Electricity. Document CEN EN 14011:2000.

CFB (2008). Methods for the Water Framework Directive. Electric Fishing in Wadeable Reaches. Central Fisheries Board. Unpublished report.

Degerman, E., Tamario, C., Watz, J., Nilsson, P. A., & Calles, O. (2019). Occurrence and habitat use of European eel (*Anguilla anguilla*) in running waters: lessons for improved monitoring, habitat restoration and stocking. Aquatic ecology, 53(4), 639-650.

EA (2003). River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003. Environment Agency, UK.

EPA (2012). Establishment of Groundwater Source Protection Zones. Mid-Cork Public Water Supply Scheme. Rev. A. May 2012.

Feeley, H. B., Baars, J. R., Kelly-Quinn, M., & Nelson, B. (2020). Ireland Red List No. 13: Stoneflies (Plecoptera). National Parks and Wildlife Service.

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

Foster, G. N., Nelson, B. H. & O Connor, Á. (2009). Ireland Red List No. 1 – Water beetles. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Gammell, M., McFarlane, A., Brady, D., O'Brien, J., Mirimin, L., Graham, C., Lally, H., Minto, C. & O'Connor, I. (2021). White-clawed Crayfish *Austropotamobius pallipes* survey in designated SACs in 2017. Irish Wildlife Manuals, No. 131. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

Harvey, J. & Cowx, I. (2003). Monitoring the River, Sea and Brook Lamprey, *Lampetra fluviatilis, L. planer*i and *Petromyzon marinus*. Conserving Natura 2000 Rivers Monitoring Series No. 5, English Nature, Peterborough.

Hendry, K., & Cragg-Hine, D. (1997). Restoration of Riverine Salmon Habitats: A Guidance Manual. Environment Agency.

Hendry, K., Cragg-Hine, D., O'Grady, M., Sambrook, H., & Stephen, A. (2003). Management of habitat for rehabilitation and enhancement of salmonid stocks. Fisheries Research, 62(2), 171-192.

Hong, S., Di Febbraro, M., Loy, A., Cowan, P., & Joo, G. J. (2020). Large scale faecal (spraint) counts indicate the population status of endangered Eurasian otters (*Lutra lutra*). Ecological Indicators, 109, 105844.

IFI (2010). Biosecurity Protocol for Field Survey Work. Available at http://www.fisheriesireland.ie/Invasive-Species/biosecurity-protocol-for-field-survey-work.html

Kelly-Quinn, M. & Regan, E.C. (2012). Ireland Red List No. 7: Mayflies (Ephemeroptera). National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Kelly, F.L., Matson, R., Connor, L., Feeney, R., Morrissey, E., Wogerbauer, C. & Rocks, K. (2013). Water Framework Directive Fish Stock Survey of Rivers in the South Western River Basin District. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011). Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Laffaille P., Feunteun E., Baisez A., Robinet T., Acou A., Legault A. & Lek S. (2003). Spatial organisation of European eel (*Anguilla anguilla* L.) in a small catchment. Ecology of Freshwater Fish 12, 254–264.

Lockhart, N., Hodgetts, N. & Holyoak, D. (2012). Ireland Red List No.8: Bryophytes. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Matondo, B. N., Benitez, J. P., Dierckx, A., Renardy, S., Rollin, X., Colson, D., ... & Ovidio, M. (2021). What are the best upland river characteristics for glass eel restocking practice?. Science of the Total Environment, 784, 147042.

Matson, R., Delanty, K., Gordon, P., O'Briain, R., McCarthy, E., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., McLoone, P., Morrisey-McCaffrey, E., Brett, T., Gavin, A & Kelly, F.L., (2019). Fish in Rivers Factsheet – Bride River Catchment, 2018/8. National Research Survey Programme. Inland Fisheries Ireland.

McGinnity, P., Gargan, P., Roche, W., Mills, P. & McGarrigle, M. (2003). Quantification of the Freshwater Salmon Habitat Asset in Ireland using data interpreted in a GIS platform. Irish Freshwater Fisheries, Ecology and Management Series: Number 3, Central Fisheries Board, Dublin, Ireland.

Nelson, B. (2000). Aquatic insect communities of Northern Irish freshwaters. Internationale Vereinigung für theoretische und angewandte Limnologie: Verhandlungen, 27(2), 891-894.

Nelson, B., Ronayne, C. & Thompson, R. (2011). Ireland Red List No.6: Damselflies & Dragonflies (Odonata). National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

NPWS (2012). Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes. National Roads Authority, Dublin.

O'Grady, M.F. (2006). Channels and challenges: enhancing Salmonid rivers. Irish Fresh- water Fisheries Ecology and Management Series: Number 4. Central Fisheries Board, Dublin.

Peay, S. (2003). Monitoring the white-clawed crayfish Austropotamobius pallipes. Conserving Natura 2000 Rivers Monitoring Series No. 1, English Nature, Peterborough.

Pike, C., Crook, V. & Gollock, M. (2020). *Anguilla anguilla*. The IUCN Red List of Threatened Species 2020: e.T60344A152845178. https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T60344A152845178.en.

Remonti, L., Balestrieri, A., & Prigioni, C. (2009). Altitudinal gradient of Eurasian otter (*Lutra lutra*) food niche in Mediterranean habitats. Canadian Journal of Zoology, 87(4), 285-291.

Scorpio, V., Loy, A., Di Febbraro, M., Rizzo, A., Aucelli, P. (2016). Hydromorphology meets mammal ecology: river morphological quality, recent channel adjustments and otter resilience. River Res. Appl. 32, 267–279.

Sittenthaler, M., Koskoff, L., Pinter, K., Nopp-Mayr, U., Parz-Gollner, R., & Hackländer, K. (2019). Fish size selection and diet composition of Eurasian otters (*Lutra lutra*) in salmonid streams: Picky gourmets rather than opportunists? Knowledge & Management of Aquatic Ecosystems, (420), 29.

Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., ... & MacGarthaigh, M. (2005). Water quality in Ireland. Environmental Protection Agency, Co. Wexford, Ireland.

Trodd, W., O'Boyle, S., Bradley, C., Smith, J., McDonnell, N., Tierney, D., Barry, J., Little, R., Wilkes, R., McDermott, G., Stephens, A., Maher, P., McGinn, R., Treacy, P., Wynne, C., Cunningham, D, Deakin, J., & Gurrie, M. (2022). Water Quality in Ireland 2016 – 2021. Environmental Protection Agency, Wexford. Available at: https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/Water-Quality-in-Ireland-2016-2021-Report.pdf

Wyse-Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M., & Wright, M. (2016). Ireland red list no. 10: Vascular plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

7. Appendix A – Macro-invertebrates (biological water quality)

Table 7.1 Macro-invertebrate Q-sampling results for proposed GCR crossings, April 2025

Group	Family	Species	1a	1b	3a/4a	3b	3c	3d	3e	3f	4b	4c	4d	X1	4e	4f	EPA group
Ephemeroptera	Heptageniidae	*Ecdyonurus dispar*							1				2	1			**A**
Ephemeroptera	Heptageniidae	*Rhithrogena semicolorata*			2	28	33	3	4	2	26		72	46	23		**A**
Plecoptera	Chloroperlidae	*Siphonoperla torrentium*			4		5	2	1	10	7	1	2	4		2	**A**
Plecoptera	Nemouridae	*Amphinemura sulcicollis*			8	4							5		6	1	**A**
Plecoptera	Nemouridae	*Protonemura meyeri*					1		1				1	3			**A**
Plecoptera	Perlidae	*Dinocras cephalotes*											2	1			**A**
Plecoptera	Perlodidae	*Isoperla grammatica*				4	10	1		1	23		5	6	2	4	**A**
Plecoptera	Taeniopterygidae	*Brachyptera risi*			4	5			3	16	2		6		11		**A**
Ephemeroptera	Baetidae	*Alainites muticus*		2	2		3	1	2					2	2		**B**
Plecoptera	Leuctridae	*Leuctra fusca*			18	2	6	14	4	41		3	6	4	2	2	**B**
Trichoptera	Glossosomatidae	*Agapetus fuscipes*					1							2		2	**B**
Trichoptera	Goeridae	*Silo pallipes*						2					1			1	**B**
Trichoptera	Limnephilidae	*Drusus annulatus*									1	1				1	**B**
Trichoptera	Limnephilidae	*Halesus radiatus*		2		2				3	1	3					**B**
Trichoptera	Limnephilidae	*Potamophylax cingulatus*				2		7	2	1	1						**B**
Trichoptera	Limnephilidae	sp. indet.														1	**B**
Trichoptera	Sericostomatidae	*Sericostoma personatum*	2	1				1	3			2					**B**
Hemiptera	Veliidae	Veliidae nymph										1					**B**
Ephemeroptera	Baetidae	*Baetis rhodani*	11	5	42	41	5	12		15	28	3	12	10	7	6	**C**
Ephemeroptera	Caenidae	*Caenis rivulorum*		1													**C**
Ephemeroptera	Ephemerellidae	*Serratella ignita*		4			1	3						2			**C**
Trichoptera	Hydropsychidae	*Diplectrona felix*								1					4		**C**
Trichoptera	Hydropsychidae	*Hydropsyche instabilis*					2						1	3			**C**
Trichoptera	Hydropsychidae	*Hydropsyche siltalai*					3	2	2		2	1	5	3			**C**
Trichoptera	Philopotamidae	*Wormaldia occipitalis*			2			1	10	4							**C**

Group	Family	Species	1a	1b	3a/4a	3b	3c	3d	3e	3f	4b	4c	4d	X1	4e	4f	EPA group
Trichoptera	Polycentropodidae	*Plectrocnemia conspersa*							1			1				1	**C**
Trichoptera	Rhyacophilidae	*Rhyacophila dorsalis*				2	1				2		1	4			**C**
Trichoptera	Rhyacophilidae	*Rhyacophila munda*				1		1									**C**
Arachnida	Hydrachnidiae	sp. indet.					1					1		1			**C**
Coleoptera	Dytiscidae	*Hydroporus tessellatus*									1					1	**C**
Coleoptera	Dytiscidae	*Oreodytes sanmarkii*					1										**C**
Coleoptera	Elmidae	*Elmis aenea*		1	7	5	7	3	1					6		2	**C**
Coleoptera	Elmidae	*Limnius volckmari*	2		4	6	13	7		1	4		3	6			**C**
Coleoptera	Gyrinidae	Gyrinidae larva	1			1	2				1		1				**C**
Coleoptera	Hydraenidae	*Hydraena gracilis*			1	1									1		**C**
Coleoptera	Hydrophilidae	*Helophorus grandis*									1						**C**
Crustacea	Gammaridae	*Gammarus duebeni*		14	3	3	2	17	17	7	5	3	1	5	1	3	**C**
Diptera	Chironomidae	Non-*Chironomus* spp.		1	4		26	1	1				5	1	1	1	**C**
Diptera	Culicidae	sp. indet.					2										**C**
Diptera	Pediciidae	*Dicranota* sp.	1		7		2		1	1		1					**C**
Diptera	Simuliidae	sp. indet.			10					2	3		1	2			**C**
Diptera	Thaumaleidea	sp. indet.														1	**C**
Diptera	Tipuliidae	*Tipula* sp.							1					1			**C**
Gastropoda	Tateidae	*Potamopyrgus antipodarum*	6	1								2					**C**
Gastropoda	Planorbidae	*Ancylus fluviatilis*			1											1	**C**
Gastropoda	Lymnaeidae	*Ampullacaena balthica*		3							3						**D**
Diptera	Chironomidae	*Chironomus* spp.	1				1										**E**
Abundance			**24**	**35**	**119**	**107**	**128**	**78**	**55**	**105**	**111**	**23**	**132**	**113**	**60**	**30**	
Q-rating			Q3	Q3	Q4-5	Q4-5	Q4-5	Q4	Q4-5	Q4-5	Q4-5	Q4	Q4-5	Q4-5	Q4-5	Q4	
WFD status			Poor	Poor	High	High	High	Good	High	High	High	Good	High	High	High	Good	

Triturus Environmental Ltd.,

Unit 5 Anchor Business Park,

Little Island,

Co. Cork,

T45 XN59.

FEHILY TIMONEY

DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

APPENDIX B

River Blackwater (Cork/Waterford) SAC Conservation Objectives

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Blackwater River (Cork/Waterford) SAC 002170

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:
NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Series Editors: Rebecca Jeffrey & Naomi Kingston
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***

002170	Blackwater River (Cork/Waterford) SAC
1029	Freshwater Pearl Mussel *Margaritifera margaritifera*
1092	White-clawed Crayfish *Austropotamobius pallipes*
1095	Sea Lamprey *Petromyzon marinus*
1096	Brook Lamprey *Lampetra planeri*
1099	River Lamprey *Lampetra fluviatilis*
1103	Twaite Shad *Alosa fallax*
1106	Atlantic Salmon *Salmo salar* (only in fresh water)
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1220	Perennial vegetation of stony banks
1310	*Salicornia* and other annuals colonizing mud and sand
1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
1355	Otter *Lutra lutra*
1410	Mediterranean salt meadows (*Juncetalia maritimi*)
1421	Killarney Fern *Trichomanes speciosum*
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
91E0	*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)
91J0	**Taxus baccata* woods of the British Isles

Please note that this SAC overlaps with Blackwater Estuary SPA (004028), Blackwater Callows SPA (004094) and Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161). It is also adjacent to Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent sites as appropriate.

Supporting documents, relevant reports & publications (listed by date)

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

Title: Aspects of brook lamprey (*Lampetra planeri* Bloch) spawning in Irish waters

Year: in press

Author: Rooney, S.M.; O'Gorman, N.M.; Green, F.; King, J.J.

Series: Biology and Environment

Title: River Blackwater (Cork/Waterford) SAC (0002170). Conservation objectives supporting document - coastal habitats [Version 1]

Year: 2012

Author: NPWS

Series: Unpublished Report to NPWS

Title: River Blackwater (Cork/Waterford) SAC (0002170). Conservation objectives supporting document - marine habitats [Version 1]

Year: 2012

Author: NPWS

Series: Unpublished Report to NPWS

Title: River Blackwater (Cork/Waterford) SAC (0002170). Conservation objectives supporting document - woodland habitats [Version 1]

Year: 2012

Author: NPWS

Series: Unpublished Report to NPWS

Title: Comparison of field- and GIS-based assessments of barriers to Atlantic salmon migration: a case study in the Nore Catchment, Republic of Ireland

Year: 2011

Author: Gargan, P. G.; Roche, W. K.; Keane, S.; King, J.J.; Cullagh, A.; Mills, P.; O'Keeffe, J.

Series: J. Appl. Ichthyol. 27 (Suppl. 3), 66–72

Title: Second Draft Licky Freshwater Pearl Mussel Sub-basin Management Plan (2009-2015)

Year: 2010c

Author: DEHLG

Series: Unpublished Report to NPWS

Title: Second Draft Allow Freshwater Pearl Mussel Sub-basin Management Plan (2009-2015)

Year: 2010b

Author: DEHLG

Series: Unpublished Report to NPWS

Title: Second Draft Munster Blackwater Freshwater Pearl Mussel Sub-basin Management Plan (2009-2015)

Year: 2010a

Author: DEHLG

Series: Unpublished Report to NPWS

Title: Subtidal benthic investigations in Blackwater River cSAC (Site Code:IE002170) and Blackwater Estuary SPA (IE004028), Co. Cork/Waterford

Year: 2010

Author: Aquafact

Series: Unpublished Report to NPWS & MI

Title: A survey of mudflats and sandflats in Ireland. An intertidal soft sediment survey of the lower Blackwater Estuary

Year: 2010

Author: ASU

Series: Unpublished Report to NPWS & MI

Title: Otter tracking study of Roaringwater Bay

Year: 2010

Author: De Jongh, A.; O'Neill, L.

Series: Unpublished Draft Report to NPWS

Title: A provisional inventory of ancient and long-established woodland in Ireland

Year: 2010

Author: Perrin, P.M.; Daly, O.H.

Series: Irish Wildlife Manuals No. 46

Title: A technical manual for monitoring white-clawed crayfish *Austropotamobius pallipes* in Irish lakes

Year: 2010

Author: Reynolds, J.D.; O'Connor, W.; O'Keeffe, C.; Lynn, D.

Series: Irish Wildlife Manuals No. 45

Title: Report of the standing scientific committee to the DCENR. The status of Irish salmon stocks in 2010 and precautionary catch advice for 2011

Year: 2010

Author: SSC

Series: Unpublished Report to DCENR

Title: The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. [S.I. 296 of 2009]

Year: 2009b

Author: Government of Ireland

Series: Irish Statute Book

Title: The European Communities Environmental Objectives (Surface Water) Regulations 2009. [S.I. 272 of 2009]

Year: 2009a

Author: Government of Ireland

Series: Irish Statute Book

Title: Saltmarsh Monitoring Report 2007-2008

Year: 2009

Author: McCorry, M.; Ryle, T.

Series: Unpublished Report to NPWS

Title: Wildflowers of Cork City and County

Year: 2009

Author: O'Mahony, T.

Series: The Collins Press, Cork

Title: Mitigation of arterial drainage maintenance works on the Awbeg River, Co Cork in relation to conservation of white-clawed crayfsh, *Austropotamobius pallipes*, within the River Blackwater SAC

Year: 2009

Author: Williams, L.

Series: Unpublished Report to NPWS

Title: Flora of County Waterford

Year: 2008

Author: Green, P.

Series: The National Botanic Gardens of Ireland, Dublin

Title: Aspects of anadromous Allis shad (*Alosa alosa* Linnaeus) and Twaite shad (*Alosa fallax* Lacépède) biology in four Irish Special Areas of Conservation (SACs): status, spawning indications and implications for consŜǊØI·ǘ⅄ƻƴ ŘŜǎ⅄ƎƴI·ǘ⅄ƻƴ

Year: 2008

Author: King, J.J.; Roche, W.K.

Series: Hydrobiologia 602, 145–154

Title: Poor water quality constrains the distribution and movements of Twaite shad *Alosa fallax fallax* (Lacepede, 1803) in the watershed of river Scheldt

Year: 2008

Author: Maas, J.; Stevens, M. ; Breine, J.

Series: Hydrobiologia 602, 129 - 143

Title: All Ireland Species Action Plan - Killarney fern

Year: 2008

Author: NPWS ; EHS-NI

Series: Unpublished Report to NPWS & EHS-NI

Title: National Survey of Native Woodlands 2003-2008

Year: 2008

Author: Perrin, P.; Martin, J.; Barron, S.; O'Neill, F.; McNutt, K.; Delaney, A.

Series: Unpublished Report to NPWS

Title: Evolutionary history of lamprey paired species *Lampetra fluviatilis* (L.) and *Lampetra planeri* (Bloch) as inferred from mitochondrial DNA variation

Year: 2007

Author: Espanhol, R.; Almeida, P.R.; Alves, M.J.

Series: Molecular Ecology 16, 1909-1924

Title: Interpretation manual of European Union habitats- EUR 27

Year: 2007

Author: European Commission

Series: DG Environment, Brussels

Title: Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents, Article 17 forms and supporting maps

Year: 2007

Author: NPWS

Series: Unpublished Report to NPWS

Title: A Survey of Juvenile Lamprey Populations in the Corrib and Suir Catchments

Year: 2007

Author: O'Connor, W.

Series: Irish Wildlife Manuals No. 26

Title: Otter Survey of Ireland 2004/2005

Year: 2006

Author: Bailey, M.; Rochford, J.

Series: Irish Wildlife Manuals No. 23

Title: The status of host fish populations and fish species richness in European freshwater pearl mussel (*Margaritifera margaritifera*) streams

Year: 2006

Author: Geist, J.; Porkka, M.; Kuehn, R.

Series: Aquatic Conservation: Marine and Freshwater Ecosystems 16, 251–266

Title: The distribution of Lamprey in the River Barrow SAC

Year: 2006

Author: King, J.J.

Series: Irish Wildlife Manuals No. 21

Title: Otters - ecology, behaviour and conservation

Year: 2006

Author: Kruuk, H.

Series: Oxford University Press

Title: Conservation Plan for River Blackwater (Cork/Waterford) SAC. Draft 0 – descriptive section

Year: 2006

Author: NPWS

Series: Unpublished Draft Report to NPWS

Title: The ecology and conservation of the gametophyte generation of the Killarney Fern (*Trichomanes speciosum* Willd.) in Ireland

Year: 2005

Author: Kingston, N. ; Hayes, C.

Series: Biology and Environment: Proceedings of the Royal Irish Academy 105B(2): 71-79

Title: Initiation of a monitoring program for the freshwater pearl mussel, *Margaritifera margaritifera* (L.) in the Licky River

Year: 2005

Author: Ross, E.D.

Series: Unpublished Report to NPWS

Title: The status and distribution of lamprey and shad in the Slaney and Munster Blackwater SACs
Year: 2004
Author: King, J.J.; Linnane, S.M.
Series: Irish Wildlife Manuals No. 14

Title: Identifying lamprey. A field key for sea, river and brook lamprey
Year: 2003
Author: Gardiner, R.
Series: Conserving Natura 2000 rivers, Conservation techniques No. 4. English Nature, Peterborough

Title: Monitoring the river, sea and brook lamprey, *Lampetra fluviatilis*, *L. planeri* and *Petromyzon marinus*
Year: 2003
Author: Harvey, J.; Cowx, I.
Series: Conserving Natura 2000 Rivers Monitoring Series No. 5. English Nature, Peterborough

Title: Ecology of Watercourses Characterised by *Ranunculion fluitantis* and *Callitricho-Batrachion* Vegetation
Year: 2003
Author: Hatton-Ellis, T.W.; Grieve, N.
Series: Conserving Natura 2000 Rivers Ecology Series No. 11. English Nature, Peterborough

Title: Ecology of the Allis and Twaite shad
Year: 2003
Author: Maitland, P.S.; Hatton-Ellis, T.W.
Series: Conserving Natura 2000 Rivers Ecology Series No. 3. English Nature, Peterborough

Title: Pondweeds of Great Britain and Ireland
Year: 2003
Author: Preston, C.D.
Series: BSBI Handbook, No. 8, London

Title: A survey of the white-clawed crayfish, *Austropotamobius pallipes* (Lereboullet) and of water quality in two catchments of Eastern Ireland
Year: 2002
Author: Demers, A.; Reynolds, J. D.
Series: Bulletin Français de la Pêche et de la Pisciculture, 367: 729-740

Title: Reversing the habitat fragmentation of British woodlands
Year: 2002
Author: Peterken, G.
Series: WWF-UK, London

Title: Aquatic Plants in Britain and Ireland
Year: 2001
Author: Preston, C.D.
Series: Harley Books, Colchester

Title: National Shingle Beach Survey of Ireland 1999

Year: 1999

Author: Moore, D.; Wilson, F.

Series: Unpublished Report to NPWS

Title: The saltmarshes of Ireland: an inventory and account of their geographical variation

Year: 1998

Author: Curtis, T.G.F.; Sheehy-Skeffington, M.J.

Series: Biology and Environment, Proceedings of the Royal Irish Academy 98B: 87-104

Title: The spatial organization of otters (*Lutra lutra*) in Shetland

Year: 1991

Author: Kruuk, H.; Moorhouse, A.

Series: J. Zool, 224: 41-57

Title: Otter survey of Ireland

Year: 1982

Author: Chapman, P.J.; Chapman, L.L.

Series: Unpublished Report to Vincent Wildlife Trust

Spatial data sources

Year:	2010
Title:	EPA WFD transitional waterbody data
GIS operations:	Clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	1130 (map 3)
Year:	Interpolated 2012
Title:	Mudflat and sandflat survey 2010; subtidal survey 2010
GIS operations:	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data. Expert opinion used as necessary to resolve any issues arising
Used for:	Marine community types, 1140 (maps 4 and 5)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	High water mark (HWM) and low water mark (LWM) polyline feature classes converted into polygon feature classes and combined; EU Annex I Saltmarsh and Coastal data erased out if present
Used for:	Marine community types base data (map 5)
Year:	Revision 2010
Title:	Saltmarsh Monitoring Project 2007-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary; overlapping regions with Coastal CO data investigated and resolved with expert opinion used
Used for:	1310, 1330, 1410 (map 6)
Year:	Revision 2010
Title:	National Survey of Native Woodlands 2003-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	91A0, 91E0 (map 7)
Year:	2012
Title:	Coillte hardcopy map
GIS operations:	Polygon digitised; clipped to SAC boundary
Used for:	91J0 (map 7)
Year:	Revision 2012
Title:	NPWS conservation plan spatial data 2006
GIS operations:	WN, WD1 and WD2 polygons merged; clipped to SAC boundary
Used for:	semi-natural woodland (map 7)
Year:	Revision 2012
Title:	Margaritifera Sensitive Areas data
GIS operations:	Relevant catchment boundaries identified. Expert opinion used as necessary to resolve any issues arising
Used for:	1029 (map 8)

Year:	2011
Title:	NPWS rare and threatened species database
GIS operations:	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used for:	1029, 1092, 1095, 1096, 1099, 1421 (maps 8, 9 and 10)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	Creation of an 80m buffer on the marine side of the high water mark (HWM); creation of a 10m buffer on the terrestrial side of the HWM; combination of 80m and 10m HWM buffer datasets; creation of a 10m buffer on the terrestrial side of the river banks data; creation of 20m buffer applied to canal centreline data. These datasets are combined with the derived EPA WFD Waterbodies data for the 1355 CO. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	1355 (no map)
Year:	2010
Title:	EPA WFD Waterbodies data
GIS operations:	Creation of a 20m buffer applied to river and stream centreline data; creation of 80m buffer on the aquatic side of lake data; creation of 10m buffer on the terrestrial side of lake data. These datasets are combined with the derived OSi data and Coastal Lagoon data for the 1355 CO. Overlapping regions investigated and resloved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	1355 (no map)

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Kilometres	Maintain at 161km. See map 8	The freshwater pearl mussel is known from the main Blackwater River, two tributaries (Owentaraglin and Allow) and the Licky River, which discharges to the Upper Blackwater Estuary. 168km encompasses the length of channel from the most upstream records of the freshwater pearl mussel to the most downstream records of live mussels, and contained within the freshwater pearl mussel catchment boundaries displayed on map 8
Population size	Number of adult mussels	Restore to 35,000 adult mussels	The SAC has three populations listed on the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations of 2009 (Government of Ireland, 2009b): Munster Blackwater, Allow (Munster Blackwater) and Licky. The separation of the main channel Blackwater and Allow into two populations is artificial and no longer considered appropriate. The Licky, however, is a distinct population, being separated from the Blackwater by brackish water and a hydrological distance of approx. 30km, making genetic exchange very unlikely. Information on the size of the population in the Blackwater and its tributaries is poor, but estimated at less than 10,000 for the Blackwater main channel (target set at 10,000); and between 10,000 and 20,000 for the Allow tributary (target set at 15,000) (DEHLG, 2010a, 2010b). The Licky population was estimated as just greater than 10,000 in 2005, but was estimated to have declined to approx. 4,700 by 2009 (target set at 10,000) (Ross, 2005; DEHLG, 2010c)

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population structure: recruitment	Percentage per size class	Restore to least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length	Mussels of no more than 65mm are considered 'young mussels' and may be found buried in the substratum and/or beneath adult mussels. Mussels of no more than 30mm are 'juvenile mussels' and are always buried in the substratum. The Blackwater population is believed to be composed entirely of aged adults, with no evidence of recruitment for at least 20 years (DEHLG, 2010a). No juvenile mussels were found in the Allow and 8.3% of the population was no more than 65mm in length in 2009 (DEHLG, 2010b). No young or juvenile mussels were recorded in the Licky during monitoring in 2005 or 2009 and there was no evidence that recruitment had occurred in at least 12 years, with the smallest mussel in 2009 measuring 85.3mm (Ross, 2005; DEHLG 2010c)
Population structure: adult mortality	Percentage	No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution	5% is considered the cut-off between the combined errors associated with natural fluctuations and sampling methods and evidence of true population decline. 1% of dead shells is considered to be indicative of natural losses. The Allow passed the target for live adults, but failed that for dead shells in 2009 (DEHLG, 2010b). The Blackwater and Licky failed both targets in 2009 (DEHLG, 2010a, 2010c)

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat extent	Kilometres	Restore suitable habitat in more than 35km (see map 8) and any additional stretches necessary for salmonid spawning	The species' habitat covers stretches of very large, high energy, lowland rivers (Blackwater) and a short coastal river (Licky); and is a combination of 1) the area of habitat adult and juvenile mussels can occupy and 2) the area of spawning and nursery habitats the host fish can occupy. Fish nursery habitat typically overlaps with mussel habitat. Fish spawning habitat is generally adjacent to mussel habitat, but may lie upstream of the generalised mussel distribution. Only those salmonid spawning areas that could regularly contribute juvenile fish to the areas occupied by adult mussels should be considered. The availability of mussel habitat and fish spawning and nursery habitats are determined by flow and substratum conditions. The habitat for the species is currently unsuitable for the survival of adult mussels or the recruitment of juveniles. The target is based on the stretches of river identified, from a combination of dedicated survey and incidental records, as having suitable habitat for the species. As there has been no full baseline survey, the quality of the data from the Blackwater and its tributaries is poor
Water quality: macroinvertebrate and phytobenthos (diatoms)	ecological quality ratio (EQR)	Restore water quality-macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93	These EQRs correspond to high ecological status for these two Water Framework Directive biological quality elements. They represent high water quality with very low nutrient concentrations (oligotrophic conditions). The habitat in the Blackwater and Licky failed both standards during 2009 sampling for the Sub-basin Management Plans, while the Allow failed the macorinvertebrate target (DEHLG, 2010a, 2010b, 2010c). See also The European Communities Environmental Objectives (Surface Water Objectives) Regulations 2009 (Government of Ireland, 2009a)

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Substratum quality: filamentous algae (macroalgae), macrophytes (rooted higher plants)	Percentage	Restore substratum quality- filamentous algae: absent or trace (<5%); macrophytes: absent or trace (<5%)	Significant growth of macrophytes was found at some sites in all three populations sampled during 2009 for the Sub-basin Management Plans (DEHLG, 2010a, 2010b, 2010c). Filamentous algae were below the target at all sites sampled in the Allow, however significant growths were detected at some sampling sites in the Blackwater and Licky (DEHLG, 2010a, 2010b, 2010c). Recruitment of juvenile mussels is being prevented by the poor quality of the river substrate
Substratum quality: sediment	Occurrence	Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment	The habitat for the species is currently unsuitable for the recruitment of juveniles owing to sedimentation of the substratum. In some locations, it is also unsuitable for the survival of adult mussels, notably stretches of the Licky (DEHLG, 2010c). Significant sedimentation has been recorded during all recent mussel monitoring surveys, particularly in the Licky and Allow (DEHLG, 2010a, 2010b, 2010c). Recruitment of juvenile mussels is being prevented by the poor quality of the river substrate
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate	Differences in redox potential between the water column and the substrate correlate with differences in oxygen levels. Juvenile mussels require full oxygenation while buried in gravel. In suitable habitat, there should be very little loss of redox potential between the water column and underlying gravels. Redox potential data are currently only available from the Allow, where loss in 2009 was 31.5 - 44.1% at 5cm depth (DEHLG, 2010b)
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regimes	The availability of suitable freshwater pearl mussel habitat is largely determined by flow (catchment geology being the other important factor). In order to restore the habitat for the species, flow variability over the annual cycle must be such that: 1) high flows can wash fine sediments from the substratum, 2) low flows do not exacerbate the deposition of fines and 3) low flows do not cause stress to mussels in terms of exposure, water temperatures, food availability or aspects of the reproductive cycle

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae	Salmonid fish are host to the larval form of the freshwater pearl mussel and, thus, they are essential to the completion of the life cycle. 0+ and 1+ fish are typically used, both because of the habitat overlaps and the development of immunity with age in the fish. Fish presence is considered sufficient, as higher densities and biomass of fish are indicative of enriched conditions in mussel rivers. Geist et al. (2006) found that higher densities of host fish coincided with eutrophication, poor substrate quality for pearl mussels and a lack of pearl mussel recruitment, while significantly lower densities and biomass of host fish were associated with high numbers of juvenile mussels. Fish movement patterns must be such that 0+ fish in the vicinity of the mussel habitat remain in the mussel habitat until their 1+ summer. No fish stocking should occur within the mussel habitat, nor any works that may change the salmonid balance or residency time. The Allow and Licky freshwater pearl mussel populations appear to favour native brown trout (*Salmo trutta*), therefore, it is particularly important that these are not out-competed by stocked fish (DEHLG, 2010b, 2010c). No data on fish preferences are available for the Blackwater

1092 White-clawed Crayfish *Austropotamobius pallipes*

To maintain the favourable conservation condition of White-clawed Crayfish in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Occurrence	No reduction from baseline. See map 9	Within the Blackwater River system, white-clawed crayfish is present only on the Awbeg River. The Awbeg flows through limestone geology. There are other tributaries of the Blackwater with limestone geology but are not known to contain the species. The main Blackwater is considered chemically unsuitable for the crayfish. However, there have been two recent records from other parts of the river system. One was downstream of the confluence of the Awbeg and Blackwater and may simply represent a specimen moving out of the Awbeg. The second was upstream of Mallow and this may represent a new population or an introduction. More information is needed on these. On the Awbeg, the crayfish is found along the whole length of the designated part of the river. The Environmental Protection Agency (EPA) river quality monitoring on the Awbeg did not detect any crayfish in 2009. However, large numbers were found during river maintenance work in 2009 upstream of Buttevant and these were translocated to undisturbed habitat (Williams, 2009)
Population structure: recruitment	Percentage occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in at least 50% of positive samples	See Reynolds et al. (2010) for further details
Negative indicator species	Occurrence	No alien crayfish species	Alien crayfish species are identified as major direct threat to this species and as disease vector. See Reynolds (1998) for further details
Disease	Occurrence	No instances of disease	Disease is identified as major threat and has occurred in Ireland even in the absence of alien vectors. See Reynolds et al. (2010) for further details
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA	Target taken from Demers and Reynolds (2002). Q values based on triennial water quality surveys carried out by the EPA

1092 White-clawed Crayfish *Austropotamobius pallipes*

To maintain the favourable conservation condition of White-clawed Crayfish in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality	Crayfish need high habitat heterogeneity. Larger crayfish must have stones to hide under, or an earthen bank in which to burrow. Hatchlings shelter in vegetation, gravel and among fine tree-roots. Smaller crayfish are typically found among weed and debris in shallow water. Larger juveniles in particular may also be found among cobbles and detritus such as leaf litter. These conditions must be available on the whole length of occupied habitat

1095 Sea Lamprey *Petromyzon marinus*

To restore the favourable conservation condition of Sea Lamprey in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary. See map 10 for recorded distribution	Artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. See Gargan et al. (2011)
Population structure of juveniles	Number of age/size groups	At least three age/size groups present	Attribute and target based on data from Harvey and Cowx (2003) and O'Connor (2007)
Juvenile density in fine sediment	Juveniles/m²	Juvenile density at least 1/m²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey and Cowx (2003)
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds. See map 10 for recorded locations	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels. Survey in 2010 indicated accumulations of redds downstream of major weirs. (See also Gargan et al., 2011)
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive. See map 10 for recorded locations	Despite observed spawning activity, sampling for ammocoetes consistently fails to find these in many sampling stations and never in any great numbers. See King and Linnane (2004)

1096 Brook Lamprey *Lampetra planeri*

To maintain the favourable conservation condition of Brook Lamprey in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	% of river accessible	Access to all water courses down to first order streams	Artificial barriers can block or cause difficulties to brook lampreys migration, both up- and downstream, thereby possibly limiting species to specific stretches and creating genetically isolated populations (Espanhol et al., 2007)
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present	Attribute and target based on data from Harvey & Cowx (2003). It is impossible to distinguish between brook and river lamprey juveniles in the field (Gardiner 2003), hence they are considered together in this target
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey & Cowx (2003) who state 10/m² in optimal conditions and more than 2/m² on a catchment basis
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	Spawning site and redd attributes established by IFI (Rooney et al., in press)
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive. See map 10 for recorded locations	Many sites with suitable larval attributes i.e. fine sediment in low velocity habitat, are found not to contain larval lamprey. This may be a function of chance or probability, or may be a consequence of insufficient recruitment to fill all spatial niches. Occupancy in excess of 50% of sites would be 'reasonable' for the Irish catchments examined to date (King and Linnane, 2004; King et al., unpublished data)

1099 River Lamprey *Lampetra fluviatilis*

To maintain the favourable conservation condition of River Lamprey in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	% of river accessible	Access to all water courses down to first order streams	Artificial barriers can block or cause difficulties to river lampreys' migration, both up- and downstream, thereby possibly limiting species to specific stretches and creating genetically isolated populations (Espanhol et al., 2007)
Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present	Attribute and target based on data from Harvey & Cowx (2003). It is impossible to distinguish between river and brook lamprey juveniles in the field (Gardiner 2003), hence they are considered together in this target
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey & Cowx (2003) who state 10/m² in optimal conditions and more than 2/m² on a catchment basis
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	Spawning site and redd attributes established by IFI (Rooney et al., in press)
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive. See map 10 for recorded locations of brook/river lamprey juveniles	Many sites with suitable larval attributes i.e. fine sediment in low velocity habitat, are found not to contain larval lamprey. This may be a function of chance or probability, or may be a consequence of insufficient recruitment to fill all spatial niches. Occupancy in excess of 50% of sites would be reasonable for the Irish catchments examined to date (King and Linnane, 2004; King et al., unpublished data)

1103 Twaite Shad *Alosa fallax*

To restore the favourable conservation condition of Twaite Shad in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	In some catchments, artificial barriers block twaite shads' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Major weirs on the Blackwater prevent potential exploitation of adult spawning grounds
Population structure: age classes	Number of age classes	More than one age class present	Regular breeding has been confirmed in the River Blackwater in recent years (King and Linnane, 2004; King and Roche, 2008)
Extent and distribution of spawning habitat	m^2 and occurrence	No decline in extent and distribution of spawning habitats	
Water quality: oxygen levels	Milligrammes per litre	No lower than 5mg/l	Attribute and target based on Maas, Stevens and Briene (2008)
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plant) growth	

1106 Atlantic Salmon *Salmo salar* (only in fresh water)

To maintain the favourable conservation condition of Atlantic Salmon in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary	Artificial barriers block salmons' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Large weirs on the Blackwater may delay salmon upstream migration in certain water conditions but do not generally prevent access to spawning areas
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded	A conservation limit 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 of the National Salmon Commission's annual model output of CL attainment levels. See SSC (2010). Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. The Blackwater is currently exceeding its CL for one sea winter salmon and its multi sea winter CL for 2012
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 min sampling	Target is threshold value for rivers currently exceeding their conservation limit (CL). As stock estimates are estimated by direct counts for the Blackwater, this attribute is not currently being measured at this site
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 (*Lepeophtheirus salmonis*)
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)

1130 Estuaries

To maintain the favourable conservation condition of Estuaries in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated as 1208ha using OSi data and the Transitional Water Body area as defined under the Water Framework Directive. See marine supporting document for further details
Community extent	Hectares	Maintain the extent of the *Mytilus edulis*-dominated community, subject to natural processes. See map 5	Estimated during 2009 subtidal and intertidal surveys (Aquafact, 2010; ASU, 2010). See marine supporting document for further details
Community structure: Mytilus edulis density	Individuals/m²	Conserve the high quality of the *Mytilus edulis*-dominated community, subject to natural processes	Observed during 2009 subtidal and intertidal surveys (Aquafact, 2010; ASU, 2010). See marine supporting document for further details
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal estuarine sandy mud community complex; Subtidal estuarine fine sand with *Bathyporeia* spp. community complex; Sand and mixed sediment with polychaetes and crustaceans community complex; Coarse sediment community complex. See map 5	Habitat structure was elucidated from 2009 subtidal and intertidal surveys (Aquafact, 2010; ASU, 2010). See marine supporting document for further details

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 4	Habitat area was estimated using OSi data as 284ha. See marine supporting document for further details
Community extent	Hectares	Maintain the extent of the *Zostera*- and *Mytilus edulis*-dominated communities, subject to natural processes. See map 5	Estimated during 2009 intertidal survey (ASU, 2010). See marine supporting document for further details
Community structure: Zostera shoot density	Shoots/m²	Conserve the high quality of the *Zostera*-dominated community, subject to natural processes	Described as part of 2009 intertidal survey (ASU, 2010). See marine supporting document for further details
Community structure: Mytilus edulis density	Individuals/m²	Conserve the high quality of the *Mytilus edulis*-dominated community, subject to natural processes	Described as part of 2009 intertidal survey (ASU, 2010). See marine supporting document for further details
Community distribution	Hectares	The following community types should be conserved in a natural condition: Intertidal estuarine sandy mud community complex and Sand and mixed sediment with polychaetes and crustaceans community complex. See map 5	Habitat structure was elucidated from 2009 intertidal survey (ASU, 2010). See marine supporting document for further details

1220 Perennial vegetation of stony banks

To maintain the favourable conservation condition of Perennial vegetation of stony banks in the Blackwater River (Cork/Waterford) 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, including erosion and succession	Current area unknown. It was recorded from Ferrypoint during the National Shingle Beach Survey (Moore and Wilson, 1999). Extent was not mapped, but it was noted as one of the larger systems in County Waterford. NB further unsurveyed areas maybe present within the site
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes	Current distribution unknown
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Moore and Wilson (1999). Shingle features are relatively stable in the long term. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Moore and Wilson (1999). At Ferrypoint, the shingle is associated with shingle-based grassland and a lagoon. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain the typical vegetated shingle flora including the range of sub-communities within the different zones	Based on data from Moore and Wilson (1999). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Moore and Wilson (1999). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. See coastal habitats supporting document for further details

1310 *Salicornia* and other annuals colonizing mud and sand

To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in the Blackwater River (Cork/Waterford) 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, including erosion and succession	Habitat not recorded by McCorry and Ryle (2009) at Kinsalebeg but is known to occur at Foxhole, Black Bog and Tourig (Curtis and Sheehy-Skeffington, 1998). However, extent is un-mapped. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes	Habitat not recorded by McCorry and Ryle (2009) at Kinsalebeg but is known to occur at Foxhole, Black Bog and Tourig (Curtis and Sheehy-Skeffington, 1998). *Salicornia* is an annual species, so its distribution can vary significantly from year to year. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Sediment supply is particularly important for this pioneer saltmarsh community, as the distribution of this habitat depends on accretion rates. See coastal habitats backing document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). Creeks deliver sediment throughout saltmarsh system. Creeks and pan structures well developed in the larger sections of the marsh at Kinsalebeg. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	This pioneer saltmarsh community requires regular tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the presence of species-poor communities with typical species listed in saltmarsh Monitoring Project (McCorry and Ryle, 2009)	See coastal habitats supporting document for further details

1310 *Salicornia* and other annuals colonizing mud and sand

To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation structure: negative indicator species: *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%	Based on data from McCorry and Ryle (2009). *Spartina* was recorded at Ferrypoint, but it was not noted to form swards on the mudflats. See coastal habitats supporting document for further details

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in the Blackwater River (Cork/Waterford) 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, including erosion and succession. For sub-site mapped: Kinsalebeg - 2.77ha. See map 6	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). One sub-site that supported Atlantic salt meadow was mapped (2.77ha) and additional areas of potential saltmarsh (28.13ha) were identified from an examination of aerial photographs, giving a total estimated area of 30.90ha. Saltmarsh habitat also occurs at Tourig Hall and Ballintray House (Curtis and Sheehy-Skeffington, 1998). NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Creeks and pan structures well developed at the larger sections of marsh in the Kinsalebeg sub-site. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Atlantic salt meadow occurs in mosaic with Mediterranean salt meadow at the Kinsalebeg saltmarsh. Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	Most of the Atlantic salt meadows habitat at Kinsalebeg is grazed to a high intensity and sward height is quite low. Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of the saltmarsh area vegetated	Bare substrate occurs as a result of overgrazing in places at Kinsalebeg. Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%	Based on data from McCorry and Ryle (2009). *Spartina* occurs at Kinsalebeg sub-site, but does not occupy a significant part of the saltmarsh vegetation. See coastal habitats supporting document for further details

1355 Otter *Lutra lutra*

To restore the favourable conservation condition of Otter in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range in south-west estimated at 74.5% (Bailey & Rochford 2006)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 103ha above high water mark (HWM); 1165.7ha along river banks/ around ponds	No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007)
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 647.2ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 599.54km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman & Chapman, 1982)
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 25.06ha	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, 2006; Kruuk & Moorhouse, 1991)
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 & Rochford 2006) and wrasse and rockling in coastal waters (Kingston et al. 1999)
Barriers to connectivity	Number	No significant increase	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 & O'Neill, 2010). It is important that such commuting routes are not obstructed

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

To maintain the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in the Blackwater River (Cork/Waterford) 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, including erosion and succession. For sub-site mapped: Kinsalebeg: 1.36ha. See map 6	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). One sub-site that supports Mediterranean salt meadows was mapped (1.36ha) and additional areas of potential saltmarsh (8.67ha) were identified from an examination of aerial photographs, giving a total estimated area of 10.03ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle 2009). See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). The MSM at Kinsalebeg has a well developed saltmarsh structure in places. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Mediterranean salt meadow is found high up in the saltmarsh but requires occasional tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry and Ryle (2009). Grazing intensity is not as high as in the Atlantic salt meadows. See coastal habitats supporting document for further details

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

To maintain the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species	Percentage cover	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%	Based on data from McCorry and Ryle (2009). *Spartina* occurs at Kinsalebeg sub-site, but does not occupy a significant part of the saltmarsh vegetation. See coastal habitats supporting document for further details

1421 Killarney Fern *Trichomanes speciosum*

To maintain the favourable conservation condition of Killarney Fern in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Location	No decline. Two locations known within the SAC. See map 10	Data from NPWS rare and threatened species database
Population size	Number	Maintain size and extent of existing colonies, including sporophyte frond counts and number of gametophyte patches	
Habitat extent	m^2	No loss of suitable habitat, such as shaded rock crevices, caves or gullies in, or near to, known colonies. No loss of woodland canopy at or near to known locations	Based on Kingston & Hayes (2005) and Ni Dhuill (pers comm)
Hydrological conditions: visible water	Occurrence	Maintain hydrological conditions at the locations so that all colonies are in dripping or damp seeping habitats, and water is visible at all locations	Based on Kingston & Hayes (2005) and Ni Dhuill (pers comm)
Hydrological conditions: humidity	Number of dessicated fronds	No increase. Presence of dessicated sporophyte fronds or gametophyte mats indicates conditions are unsuitable	Based on Kingston & Hayes (2005) and Ni Dhuill (pers comm)
Light levels: shading	Percentage	No changes due to anthropogenic impacts	Based on Kingston & Hayes (2005) and Ni Dhuill (pers comm)
Invasive species	Occurrence	Absent or under control	EHS & NPWS (2008) provides further details

3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat distribution	Occurrence	No decline, subject to natural processes	The full distribution of this habitat and its sub-types in this site are currently unknown. The basis of the selection of the SAC for the habitat was the presence of plant species listed in the Interpretation Manual (European Commission, 2007), recorded during the Natural Heritage Area (NHA) survey of the river (internal NPWS files). Further records of these and other aquatic plant species in the Blackwater can be found in Green (2008) and O'Mahony (2009). The dominant floating-leaved species appears to be the common and widespread stream water-crowfoot (*Ranunculus penicillatus* subsp. *penicillatus*) (Green, 2008, O'Mahony, 2009). No high conservation value sub-types are known to occur in the SAC and further survey is required to determine whether any such are present. Only one rare/threatened vascular plant species is known to occur in the SAC, the protected opposite-leaved pondweed (*Groenlandia densa*), which is abundant in the tidal stretches around Cappoquin (Green, 2008). **Note: rooted macrophytes should be absent or trace (< 5% cover) in freshwater pearl mussel (*Margaritifera margaritifera*) habitat. The freshwater pearl mussel (1029) conservation objective takes precedence over this objective for habitat 3260 in this SAC, because the mussel requires environmental conditions closer to natural background levels**
Habitat area	Kilometres	Area stable or increasing, subject to natural processes	The full extent of this habitat in this site is currently unknown. See above

3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes	Due to regular disturbance (through variations in flow), river macrophytes rarely reach a climax condition but frequently occur as transient communities. A natural (relatively unmodified) flow regime is required for both plant communities and channel geomorphology to be in favourable condition, exhibiting typical dynamics for the river type (Hatton-Ellis and Grieve, 2003). For most of the sub-types of this habitat, high flows are required to maintain the substratum (see below) necessary for the characteristic species. Flow variation is particularly important, with high and flood flows being critical to the hydromorphology. Other aspects of hydrological regime, such as groundwater discharge are important for certain sub-types of the habitat, which may be present within the SAC
Hydrological regime: tidal influence	Daily water level fluctuations- metres	Maintain natural tidal regime	Tidal regime appears to be an important influence on the distribution of opposite-leaved pondweed (*Groenlandia densa*) in Ireland. The species is also typical of the tidal reaches of other large Irish rivers, e.g. the Slaney, the Suir and the Shannon (see Preston, 2003; Preston and Croft, 2001). Both the disturbance and substratum associated with the tidal regime may be important drivers
Substratum composition: particle size range	Millimetres	The substratum should be dominated by the particle size ranges, appropriate to the habitat sub-type (typically sands, gravels and cobbles)	The size and distribution of substratum particles is largely determined by the river flow. Different habitat sub-types and species have different substratum requirements. Opposite-leaved pondweed (*Groenlandia densa*) is typically found on silts (mud), and sometimes sands

3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Water quality: nutrients	Milligrammes per litre	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition	Phosphorus (MRP) is typically the limiting nutrient, however increased nitrogen (NO3-) negatively impacts upon some aquatic plant communities. Nutrient enrichment typically leads to increased filamentous-green-algal biomass, and consequent changes in other algae, bryophyte and macrophyte species composition and abundance. Water quality should reach a minimum of Water Framework Directive good status, in terms of nutrient and oxygenation standards and EQRs (ecological quality ratios) for macroinvertebrates and phytobenthos. For certain sub-types, other aspects of water quality, such as suspended sediment and minerals, should be considered
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition	The sub-types of this habitat are poorly understood and their typical species have not yet been defined. Typical species and appropriate targets may emerge to be site-specific. The typical species may include higher plants, bryophytes, macroalgae and microalgae
Floodplain connectivity: area	Hectares	The area of active floodplain at and upstream of the habitat should be maintained	River connectivity with the floodplain is essential for the functioning of this habitat. Floodplain connectivity is particularly important in terms of sediment sorting and nutrient deposition. The Blackwater valley has extensive floodplains. The functioning of these floodplains, in relation to sediment and nutrient dynamics, is currently being impaired by arable agriculture

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the Blackwater River (Cork/Waterford) 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, at least 263.7ha for sub-sites surveyed. See map 7	Minimum area, based on 15 sites surveyed by Perrin et al. (2008) - site codes 1326, 1340, 1354, 1355, 1359, 1459, 1488, 1490, 1492, 1543, 1626, 1819, 1842, 1844, 1846. NB further unsurveyed areas are almost certainly present within the site. Map 7 shows semi-natural woodland extent within the SAC. See woodland habitats supporting document for further details
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 7	Distribution based on Perrin et al. (2008). NB further unsurveyed areas maybe present within the site. Map 7 shows semi-natural woodland distribution within the SAC. See woodland habitats supporting document for further details
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size	The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring ‘deep’ woodland conditions (Peterken, 2002). Topographical constraints may restrict expansion. See woodland habitats supporting document for further details
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Oak regenerates poorly. In suitable sites ash can regenerate in large numbers although few seedlings reach pole size
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local disctinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-data and other rare or localised species. Perrin and Daly (2010) list the 15 sites listed above as containing potential ancient/long established woodlands
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including sessile oak (*Quercus petraea*) and birch (*Betula pubescens*)	Species reported in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: beech (*Fagus sylvatica*), sycamore (*Acer pseudoplatanus*), rhododendron (*Rhododendron ponticum*), cherry laurel (*Prunus laurocerasus*)

91E0 *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)

To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) in the Blackwater River (Cork/Waterford) 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, at least 19.2ha for sites surveyed. See map 7	Minimum area, based on 6 sites surveyed by Perrin et al. (2008) - site codes 1343, 1459, 1464, 1488, 1824, 1998. NB further unsurveyed areas are almost certainly present within the SAC. Map 7 shows semi-natural woodland extent within the SAC. See woodland habitats supporting document for further details
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 7	Distribution based on Perrin et al. (2008). NB further unsurveyed areas may be present within the SAC. Map 7 shows semi-natural woodland distribution within the SAC. See woodland habitats supporting document for further details
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size	The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring ‘deep’ woodland conditions (Peterken, 2002). Topographical and land-ownership constraints may restrict expansion
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Alder and oak regenerate poorly. Ash often regenerates in large numbers although few seedlings reach pole size
Hydrological regime: flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Periodic flooding is essential to maintain alluvial woodlands along river floodplains
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem

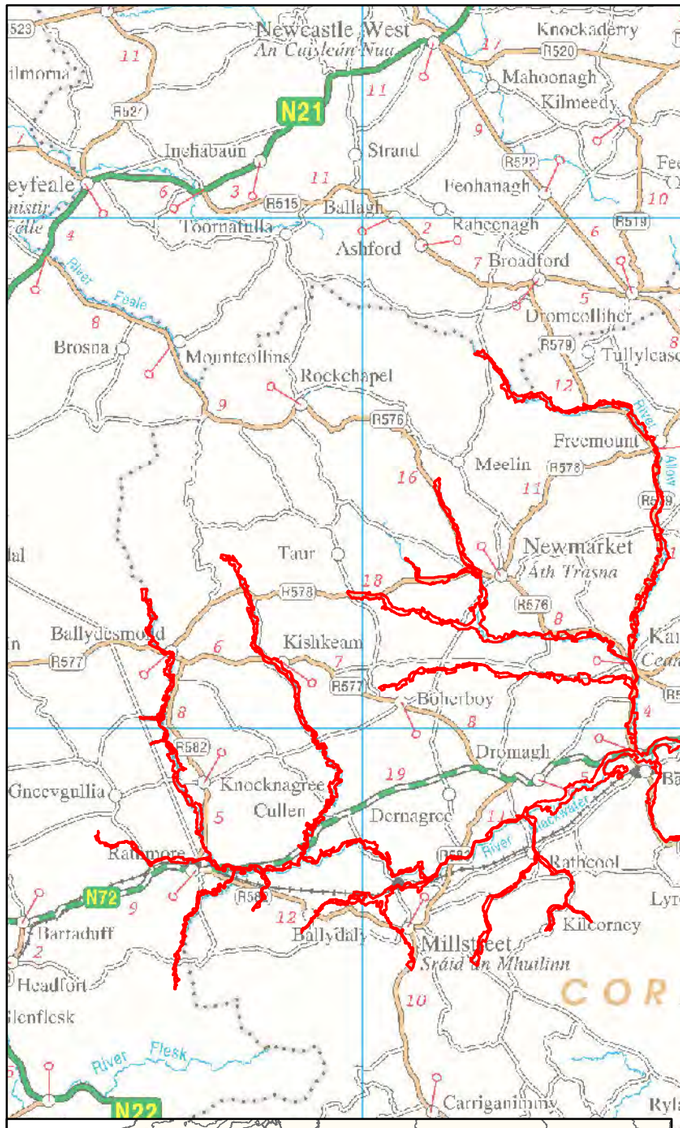
91E0 *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)

To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local disctinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-data and other rare or localised species. Perrin & Daly (2010) list three sites as containing potential ancient/long established woodlands in the SAC
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including alder (*Alnus glutinosa*), willows (*Salix* spp) and, locally, oak (*Quercus robur*) and ash (*Fraxinus excelsior*)	Species reported in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: beech (*Fagus sylvatica*), sycamore (*Acer pseudoplatanus*), cherry laurel (*Prunus laurocerasus*), Himalayan balsam (*Impatiens glandulifera*)

91J0 **Taxus baccata* woods of the British Isles

The status of *Taxus baccata* woods of the British Isles as a qualifying Annex I habitat for the Blackwater River (Cork/Waterford) SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this habitat.



MAP 1:
BLACKWATER RIVER SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

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

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04, CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06

0 5 10 15 20 km

Legend
SAC 002170

N

Map Version 1
Date: March 2012

SPA 004161

SAC 002170

SPA 004094

SAC 000365

SPA 004028

Legend

- SAC 002170
- SAC 000365
- SPA 004028
- SPA 004094
- SPA 004161
- OSi Discovery Series County Boundary

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 2:
BLACKWATER RIVER SAC CONSERVATION OBJECTIVES ADJOINING/OVERLAPPING DESIGNATIONS

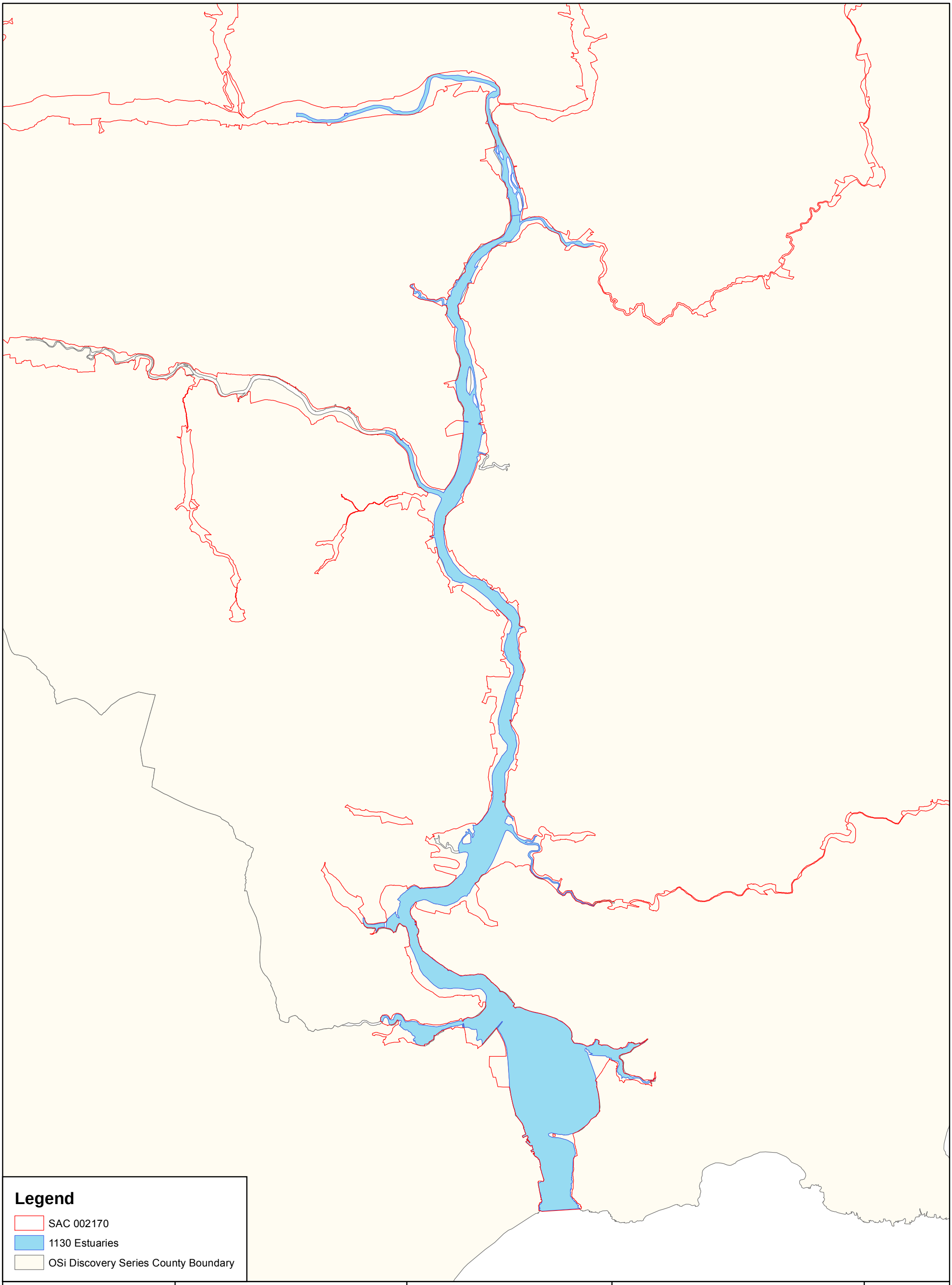
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 002170 CO. CORK; version 1.15, CO. KERRY; version 1.04, CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06
SAC 000365 CO. CORK; version 1, CO KERRY; version 1.19
SPA 004028 CO.CORK; version 1.04, CO.WATERFORD; version 1.06
SPA 004094 CO.CORK; version 1.01, CO. WATERFORD; version 1.02
SPA 004161 CO.CORK; version 2.12, CO. LIMERICK; version 2.14, CO. KERRY; version 2.17

0 5 10 15 20 km

N

Map Version 1
Date: March 2012



An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 3: BLACKWATER RIVER SAC CONSERVATION OBJECTIVES ESTUARIES

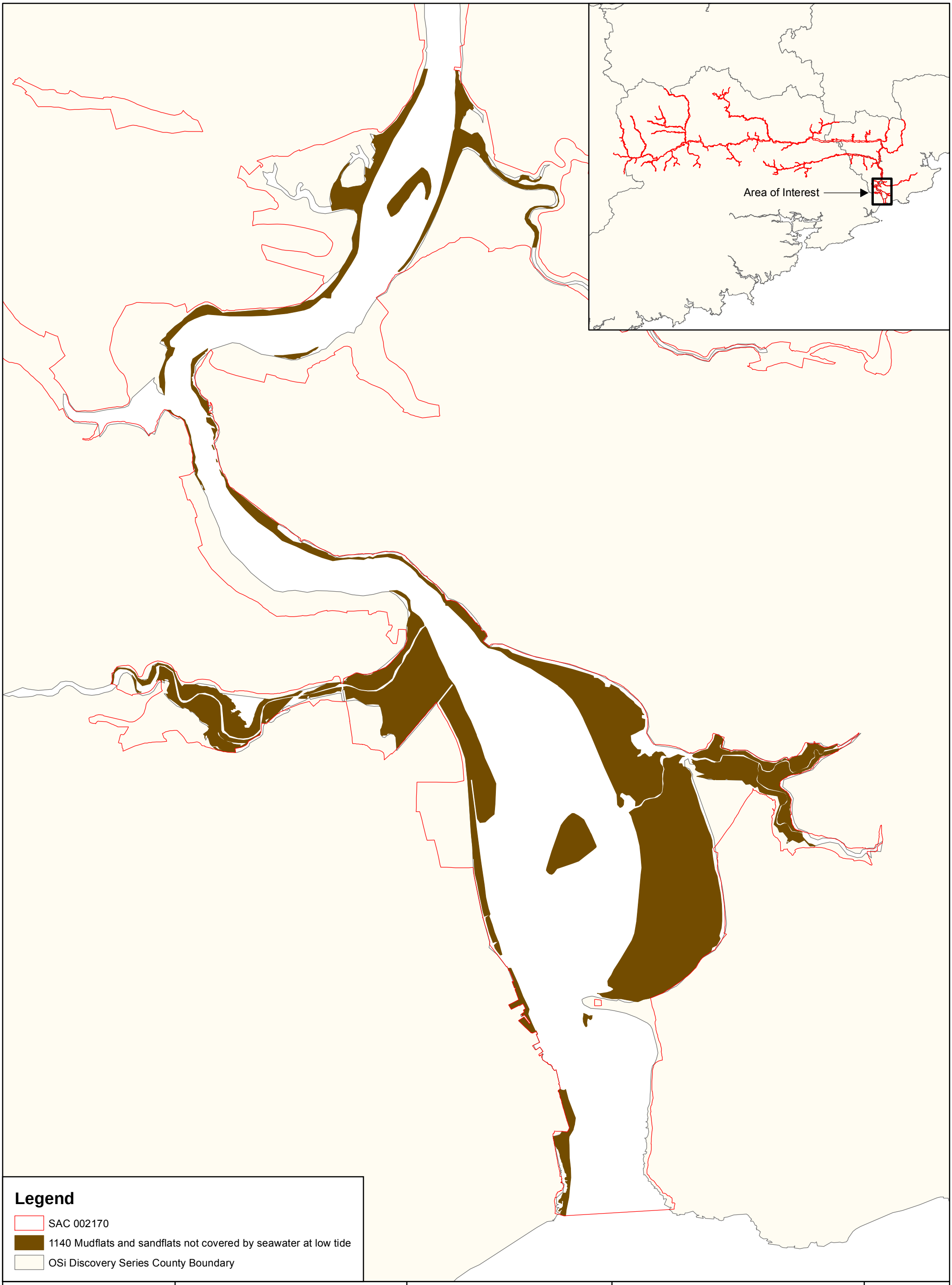
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04,
CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06

0 1 2 3 km

N

Map Version 1
Date: March 2012



Legend

- SAC 002170
- 1140 Mudflats and sandflats not covered by seawater at low tide
- OSi Discovery Series County Boundary

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 4: BLACKWATER RIVER SAC CONSERVATION OBJECTIVES TIDAL MUDFLATS & SANDFLATS

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

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04,
CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06

0 0.25 0.5 0.75 1 km

N

Map Version 1
Date: March 2012

Legend

- SAC 002170
- OSi Discovery Series County Boundary

Marine Community Type

- Coarse sediment community complex
- Intertidal estuarine sandy mud community complex
- *Mytilus edulis*-dominated community
- River
- Sand and mixed sediment with polychaetes and crustaceans community complex
- Subtidal estuarine fine sand with *Bathyporeia* spp. community complex
- *Zostera*-dominated community

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 5:
BLACKWATER RIVER SAC
CONSERVATION OBJECTIVES
MARINE COMMUNITY TYPES

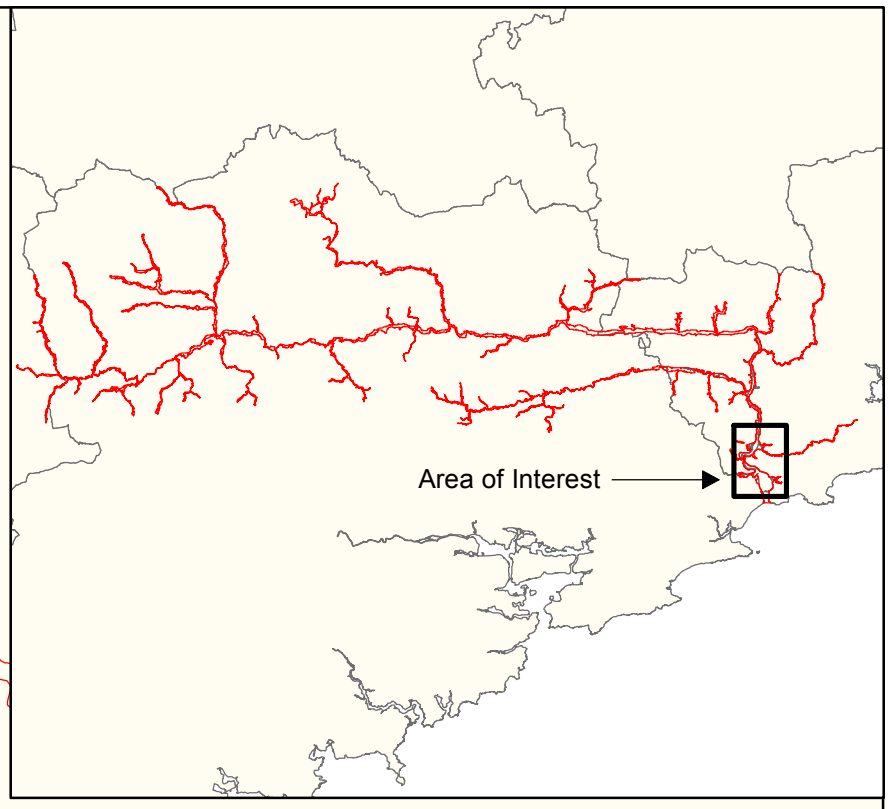
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04,
CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06

0 1 2 3 km

N

Map Version 1
Date: March 2012



SMP 0054

Legend

- SAC 002170
- OSi Discovery Series County Boundary
- SMP: 0054 Saltmarsh Monitoring Project Site Codes

Saltmarsh Habitats

Qualifying Interests

- 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
- 1410 Mediterranean salt meadows (Juncetalia maritimi)
- 1330 / 1410 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) / Mediterranean salt meadows (Juncetalia maritimi)
- Potential 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
- Potential 1330 / 1410 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) / Mediterranean salt meadows (Juncetalia maritimi)

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 6: BLACKWATER RIVER SAC CONSERVATION OBJECTIVES SALTMARSH HABITATS

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

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04, CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06

0 0.5 1 km

N

Map Version 1
Date: March 2012

NSNW: 1326
NSNW: 1490
NSNW: 1459
NSNW: 1343
NSNW: 1464
NSNW: 1355
NSNW: 1359
NSNW: 1340
NSNW: 1626
NSNW: 1543
NSNW: 1819
NSNW: 1824
NSNW: 1354
NSNW: 1492
NSNW: 1998
NSNW: 1488
NSNW: 1842
NSNW: 1846
NSNW: 1844

Legend

- SAC 002170
- OSi Discovery Series County Boundary
- NSNW: 1326 National Survey of Native Woodland Site Codes

Woodland Habitats

- 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- 91E0 *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-padion, Alnion incanae, Salicion albae)
- 91J0 **Taxus baccata* woods of the British Isles
- Semi-natural Woodland

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 7: BLACKWATER RIVER SAC CONSERVATION OBJECTIVES WOODLAND HABITATS

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

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04,
CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06

0 5 10 15 20 km

N

Map Version 1
Date: March 2012

Legend

- SAC 002170
- 1029 *Margaritifera margaritifera* Suitable Habitat
- 1029 *Margaritifera margaritifera* Distribution
- 1029 *Margaritifera margaritifera* Catchment
- OSi Discovery Series County Boundary

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 8:
BLACKWATER RIVER SAC
CONSERVATION OBJECTIVES
FRESHWATER PEARL MUSSEL

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

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04,
CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06

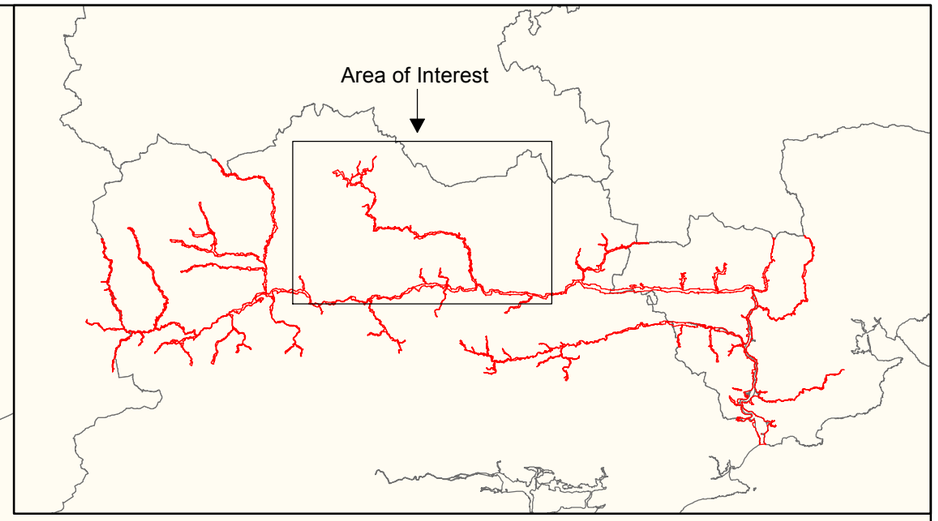
0 5 10 15 20 km

N

Map Version 1
Date: March 2012

Legend

- SAC 002170
- 1092 White-Clawed Crayfish (*Austropotamobius pallipes*)
- OSi Discovery Series County Boundary



An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

MAP 9:
BLACKWATER RIVER SAC
CONSERVATION OBJECTIVES
WHITE-CLAWED CRAYFISH

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

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04,
CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06

0 1 2 3 4 5 km

N

Map Version 1
Date: March 2012

Legend

- SAC 002170
- 1095 Sea Lamprey -*Petromyzon marinus* Juvenile
- 1095 Sea Lamprey -*Petromyzon marinus* Spawning
- 1099 / 1096 River Lamprey -*Lampetra fluviatilis* / Brook Lamprey -*Lampetra planeri* Juvenile
- 1421 Killarney Fern - *Trichomanes speciosum*
- OSi Discovery Series County Boundary

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

MAP 10:
BLACKWATER RIVER SAC
CONSERVATION OBJECTIVES
SEA LAMPREY, RIVER LAMPREY/
BROOK LAMPREY & KILLARNEY FERN

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

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04,
CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06

0 5 10 15 20 km

N

Map Version 1
Date: March 2012

FEHILY TIMONEY

DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

www.fehilytimoney.ie