TOBIN

Rooaunalaghta Green Energy Project

Appendix 6-7

2026 Aquatic Baseline Report

ROOAUNALAGHTA
Green Energy

BUILT ON KNOWLEDGE

Aquatic baseline report for the proposed Rooaunalaghta wind farm, Co. Galway (2026)

Prepared by Triturus Environmental Ltd. for Greensource

October 2026

Please cite as:

Triturus (2026). Aquatic baseline report for the proposed Rooaunalaghta wind farm, Co. Galway (2026). Report prepared by Triturus Environmental Ltd. for Greensource. October 2026.

Table of contents

1. Introduction 3

1.1 Background 3

1.2 Development description 3

2. Methodology 4

2.1 Selection of watercourses for assessment 4

2.2 Aquatic site surveys 4

2.3 Fisheries assessment (electro-fishing) 7

2.4 Fisheries habitat appraisal 8

2.5 White-clawed crayfish survey 8

2.6 Environmental DNA 8

2.7 Biological water quality (Q-sampling) 9

2.8 Lacustrine macro-invertebrate communities 9

2.9 Macrophytes and aquatic bryophytes 10

2.10 Otter signs 10

2.11 Aquatic ecological evaluation 10

2.12 Biosecurity 10

3. Desktop review 11

3.1 Survey area 11

3.2 Fisheries 11

3.3 Protected and rare aquatic species 11

4. Results of aquatic surveys 13

4.2 White-clawed crayfish survey 34

4.3 eDNA sampling 34

4.4 Biological water quality (macro-invertebrates) & lacustrine macro-invertebrates 37

5. Discussion 43

5.1 Fisheries 43

5.2 Absence of white-clawed crayfish 45

5.3 Otter signs 45

5.4 Macro-invertebrates & biological water quality 45

6. References 47

7. Appendix A – eDNA lab report 51

8. Appendix B – Macro-invertebrates & biological water quality 55

1. Introduction

1.1 Background

Triturus Environmental Ltd. were commissioned by Rooaunalaghta Green Energy Ltd. to conduct baseline aquatic surveys to inform EIAR preparation for the proposed Rooaunalaghta wind farm development near Headford, Co. Galway (**Figure 2.1**).

Undertaken on a sub 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 the proposed development, inclusive of the proposed grid cable route (GCR). Aquatic surveys were undertaken in August 2026 and would update those previously completed by APEM in 2023 (APEM, 2024) to account for design changes and ensure ecological data validity.

1.2 Development description

A full description of the proposed developments are 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 development were considered as part of the current assessment. This included those in the vicinity of the proposed site boundary, turbine array and grid cable route (GCR). Thus, a total of 11 no. riverine sites, 2 no. ponds and 1 no. seasonal lake/wetland site were selected for detailed aquatic assessment (see **Table 2.1, Figure 2.1**). The courses and nomenclature for the watercourses surveyed followed Environmental Protection Agency (EPA) and Tailte Éireann landcover mapping.

Riverine survey sites were present on the Black River (EPA code: 30B02), Rooaunalaghta Stream (30R03), Cloghmoyne Stream (30C80), Shancloon River (30S32) and several unmapped/unnamed streams in the Black[Shrule]_SC_010 river sub-catchments (**Table 2.1**). Two small ponds and Ballisnahyny E turlough near the proposed site boundary were also surveyed. A total of 7 no. survey sites were located within or were contiguous with the Lough Corrib SAC (000297). Most other survey locations shared downstream hydrological connectivity with this SAC and the Lough Corrib SPA (004042).

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

2.2 Aquatic site surveys

Aquatic surveys were conducted on the 20th, 21st and 22nd August 2026. Survey effort focused on both instream and riparian habitats at each aquatic sampling location and included a fisheries assessment (electro-fishing and or fisheries habitat appraisal), white-clawed crayfish survey, otter sign survey (within 150m of each site), macrophyte and aquatic bryophyte survey and biological water quality sampling (Q-sampling). Environmental DNA samples were also collected from 4 no. sites. 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 sites, 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 14 no. aquatic survey sites in vicinity of the proposed development

Site no.	Watercourse	EPA code	Location	X (ITM)	Y (ITM)
A1	Black River	30B02	Shrule Bridge	528000	752620
A2	Unmapped channel	n/a	Kinlough	525086	750705
P1†	**Pond**	n/a	Kinlough	525687	750422
A3	Rooaunalaghta Stream	30R03	Kinlough	525895	750020
A4*	**Black River**	30B02	Moyne Bridge	525546	749109
P2†	**Pond**	n/a	Cloghmoyne	523166	749259
A5	Cloghmoyne Stream	30C80	Moyne	522818	748777
A6	Black River	30B02	Ower Bridge	522450	748366
A7*	**Black River**	30B02	Gortabrack Bridge	520423	747786
T1	Ballisnahyny E turlough	n/a	Carrowoughteragh	523856	751656
G1	Black River	30B02	Kinlough	526246	751376
G2	Unmapped channel	n/a	L21044 road crossing	526887	751476
G3	Unmapped channel	n/a	L21044 road crossing	527333	751528
G4	Shancloon River	30S32	Killamanagh	530958	750944

* eDNA sampling for white-clawed crayfish, freshwater pearl mussel, Atlantic salmon & lamprey (*Lampetra* sp.)

† eDNA sampling for white-clawed crayfish, smooth newt and European eel

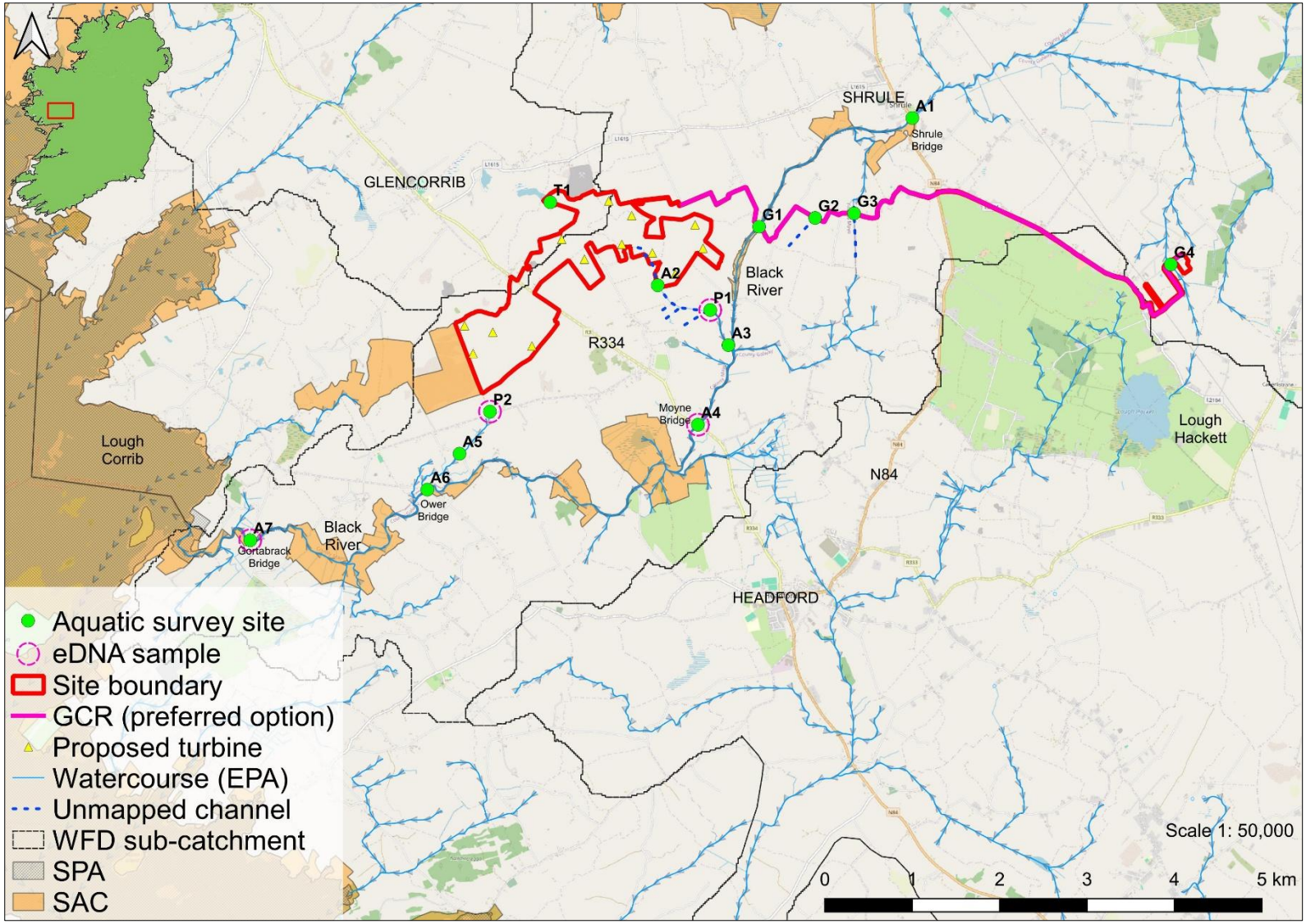


Figure 2.1 Overview of the aquatic survey sites, August 2026

2.3 Fisheries assessment (electro-fishing)

Triturus Environmental Ltd. made an application under Section 14 of the Fisheries (Consolidation) Act, 1959 as substituted by Section 4 of the Fisheries (Amendment) Act, 1962, to undertake an electro-fishing survey of watercourses in the vicinity of the proposed development. A single-anode Smith-Root LR24 backpack (12V DC input; 300V, 100W DC output) was used to electro-fish sites on the 20th, 21st and 22nd August 2026 following notification to Inland Fisheries Ireland and under the conditions of a Department of Climate, Energy and the Environment (DCEE) licence. To collate a more accurate baseline of the relevant watercourses, the electro-fishing survey was undertaken across 11 no. riverine sites (**Table 2.1, Figure 2.1**).

Both river and holding tank water temperature was monitored continually throughout the survey to ensure temperatures of 20°C were not exceeded, thus minimising stress to the captured fish due to low dissolved oxygen levels. A portable battery-powered aerator was also used to further reduce stress to any captured fish contained in the holding tank. Salmonids, European eel and other captured fish species were transferred to a holding container with oxygenated fresh river water following capture. To reduce fish stress levels, anaesthesia was not applied to captured fish. All fish were measured to the nearest millimetre and released in-situ following a suitable recovery period.

As three primary species groups were targeted during the survey, i.e., salmonids, lamprey, and eel, the electro-fishing settings were tailored for each species. By undertaking electro-fishing using the rapid electro-fishing technique (see methodology below), the broad characterisation of the fish community at each sampling reach could be determined as a longer representative length of channel was surveyed. Electro-fishing methodology followed accepted European standards (CEN, 2003) and adhered to best practice (e.g., CFB, 2008).

2.3.1 Salmonids and European eel

For salmonid species and European eel, as well as all other incidental species, electro-fishing was carried out in an upstream direction for a 10-minute CPUE, an increasingly common standard approach for wadeable streams (Matson et al., 2018). A total of approximately 30-75m channel length was surveyed at each site, where feasible, in order to gain a better representation of fish stock assemblages.

Relative conductivity of the water at each site was checked in-situ with a conductivity meter and the electro-fishing backpack was energised with the appropriate voltage and frequency to provide enough draw to attract salmonids and European eel to the anode without harm. For the relatively high conductivity waters of the sites a voltage of 200-240v, frequency of 35-40Hz and pulse duration of 3.5-4ms was utilised to draw fish to the anode without causing physical damage.

2.3.2 Lamprey

Electro-fishing for lamprey ammocoetes was conducted using targeted quadrat-based electro-fishing (as per Harvey & Cowx, 2003) in objectively suitable areas of sand/silt, where encountered. As lamprey take longer to emerge from silts and require a more persistent approach, they were targeted at a lower frequency (30Hz) burst DC pulse setting which also allowed detection of European eel in sediment, if present. Settings for lamprey followed those recommended and used by Harvey & Cowx

(2003), APEM (2004) and Niven & McAuley (2013). Using this approach, the anode was placed under the water's surface, 10-15cm above the sediment, to prevent immobilising lamprey ammocoetes within the sediment. The anode was energised with 100V of pulsed DC for 15-20 seconds and then turned off for approximately five seconds to allow ammocoetes to emerge from their burrows. The anode was switched on and off in this way for approximately two minutes. Immobilised ammocoetes were collected by a second operator using a fine-mesh hand net as they emerged.

Lamprey species were identified to species level, where possible, with the assistance of a hand lens, through external pigmentation patterns and trunk myomere counts as described by Potter & Osborne (1975) and Gardiner (2003).

2.4 Fisheries habitat appraisal

A fisheries habitat appraisal of all 14 no. survey sites (**Table 2.1**) was undertaken to establish their suitability and importance for salmonid, lamprey, European eel and other fish species in terms of spawning, nursery and or holding habitat. 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 in terms of their fisheries habitats.

2.5 White-clawed crayfish survey

White-clawed crayfish (*Austropotamobius pallipes*) surveys were undertaken at the aquatic survey sites in August 2026 under a National Parks and Wildlife (NPWS) open national licence (C017/2026) 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 each catchment or sub-catchment 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.

2.6 Environmental DNA

To further validate site surveys and to detect potentially cryptically low populations of high conservation value aquatic species within the survey area, composite water samples were collected from the Black River at sites A4 and A7 (**Figure 2.1; Table 2.1**). These were analysed for white-clawed crayfish, freshwater pearl mussel (*Margaritifera margaritifera*), European eel (*Anguilla anguilla*) and lamprey (*Lampetra* sp.) eDNA. The sites were strategically chosen to maximise longitudinal (instream) coverage within the survey area/catchment (i.e. facilitating a greater likelihood of species detection). The two pond sites P1 and P2 were sampled for white-clawed crayfish, European eel and smooth newt (*Lissotriton vulgaris*).

In accordance with laboratory guidance, a composite (500ml) water sample was collected from the sampling point, maximising the geographic spread at the site (20 x 25ml samples at each site), thus increasing the chance of detecting the target species' DNA. The composite sample was filtered and fixed on site using a sterile proprietary eDNA sampling kit. The sample was stored at room temperature and sent to the laboratory for analysis with 48 hours of collection. A total of *n*=12 qPCR replicates were analysed for the site. Given the high sensitivity of eDNA analysis, a single positive qPCR replicate is considered as proof of the species' presence (termed qPCR No Threshold, or qPCR NT). Whilst an eDNA approach is not currently quantitative, the detection of the target species' DNA indicates the presence of the species at and or upstream of the sampling point. Please refer to **Appendix A** for full eDNA laboratory analysis methodology.

2.7 Biological water quality (Q-sampling)

The 11 no. riverine survey sites were assessed for biological water quality through Q-sampling in August 2026. 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 class	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

2.8 Lacustrine macro-invertebrate communities

Lacustrine sites P1, P2 and T1 was sampled for macro-invertebrates via sweep netting. A standard pond net (250mm width, mesh size 500µm) was used to sweep macrophytes to capture macro-invertebrates. The net was also moved along the pond bed to collect epibenthic and epiphytic invertebrates from the substratum (as per Cheal et al., 1993). A 3-minute sampling period was employed. To ensure appropriate habitat coverage, the sampling period was also divided amongst the range of meso-habitats present at the survey site to get a representative sample for sub-habitats.

2.9 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 (Hodgetts & Lockhart, 2025), or habitats corresponding to Annex I habitats, such as floating river vegetation (3260) or hydrophilous tall herb (6430).

2.10 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.).

2.11 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).

2.12 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. Particular cognisance was given towards preventing the spread or introduction of highly virulent crayfish plague (*Aphanomyces astaci*). 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

The watercourses in the vicinity of proposed development (**Table 2.1; Figure 2.1**) were typically historically modified lowland depositing alkaline channels (FW2; Fossitt, 2000) within the Black [Shrule]_SC_010 river sub-catchment. The Black River (and other tributaries) were subject to arterial drainage in the 1960s. Land use practices in the wider survey area are dominated by pastures (land cover data). The survey watercourses flow over areas of Visean limestone and calcareous shale (Geological Survey of Ireland data). Due to areas of karstic limestone, parts of the Black River and other tributaries have long been known to flow underground (e.g. Went, 1942).

3.2 Fisheries

The Black River, a tributary of Lough Corrib, is known to support Atlantic salmon (*Salmo salar*), brown trout (*Salmo trutta*), European eel (*Anguilla anguilla*) and three-spined stickleback (*Gasterosteus aculeatus*) (IFI 2022 data; Kelly et al., 2013). The Black River also supports lamprey (*Lampetra* sp.) (O'Connor, 2007; Byrne et al., 2000).

Fisheries data for the other (minor) survey watercourses was not available prior to this survey.

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 proposed development (i.e. M14, M24, M25, M34 & M35) identified records for a low number of rare and or protected aquatic species.

A low number of records for Annex II white-clawed crayfish (*Austropotamobius pallipes*) were available for Lough Corrib (2004), with a more contemporary 2022 (eDNA) record for the Ballinduff Stream , a small Corrib tributary (**Figure 3.1**). None of these records overlapped with the survey area. Historical crayfish records (pre 1989) were available for the River Clare in grid square M35 (data not shown). Targeted surveys completed in 2023 for the development did not detect white-clawed crayfish (APEM, 2024).

Contemporary Annex II otter (*Lutra lutra*) records were scattered throughout the respective grid squares (2005-2018 data), including on the Black River within the survey area (**Figure 3.1**).

There were no contemporary or historical freshwater pearl mussel (*Margaritifera margaritifera*) records for the survey area with records only available for the Owenriff River on the west side of Lough Corrib (NPWS data; **Figure 3.1**).

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

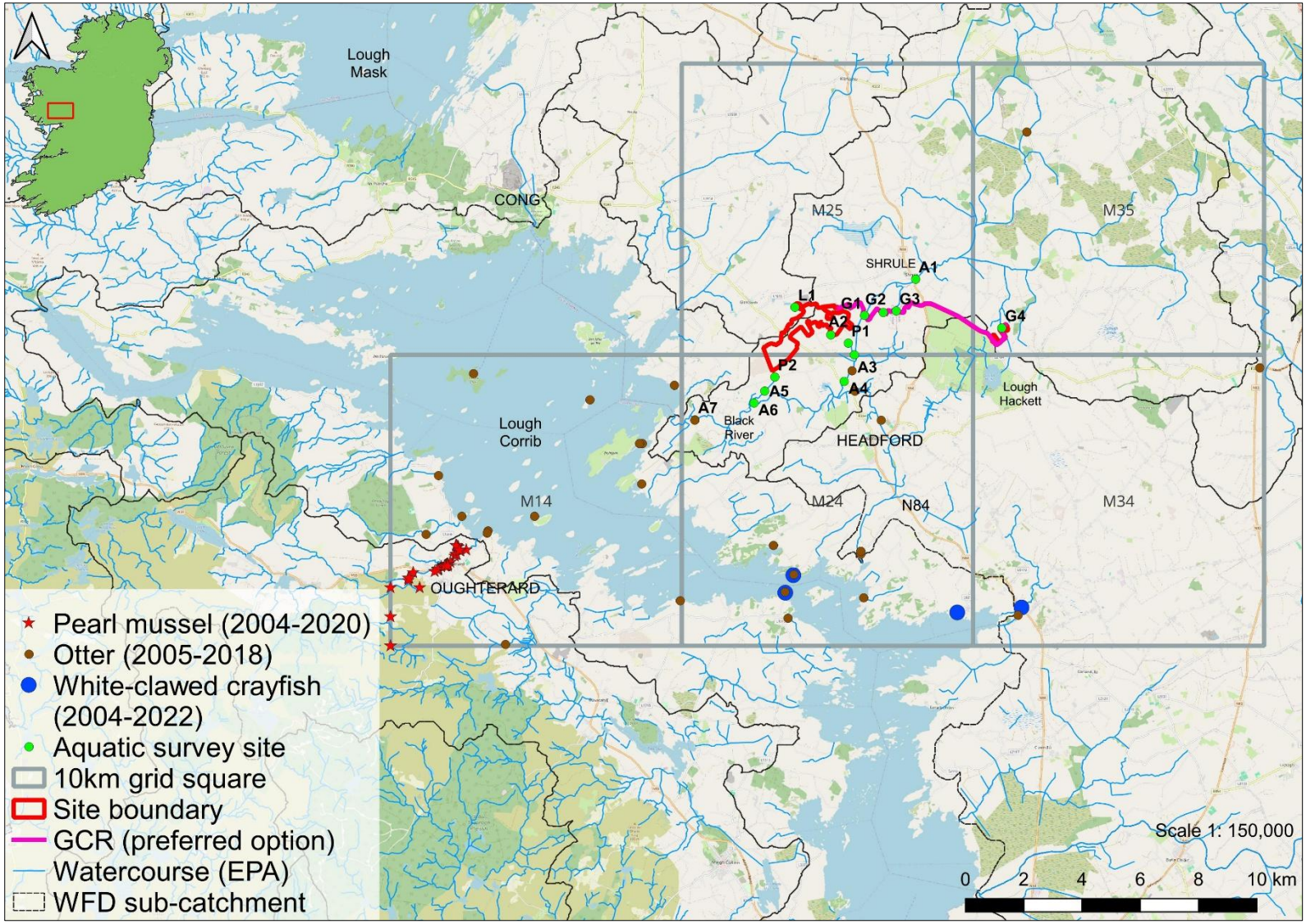


Figure 3.1 Selected rare/protected aquatic species records in vicinity of the proposed development (source: NPWS, NBDC, EPA & Triturus data)

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 riverine sampling site and presented in full in **Appendix B**. A summary of the fish species recorded at each survey site is provided in **Table 4.2** and **4.3**. A summary of the aquatic species and habitats of high conservation concern recorded during the surveys is provided in **Table 4.4**. An evaluation of the aquatic ecological importance of each survey site based on these aquatic surveys is provided and summarised in **Table 4.5**. Habitat codes are according to Fossitt (2000). Scientific names are provided at first mention only. Sites were surveyed in August 2026.

4.1 Aquatic survey site results

4.1.1 Site A1 – Black River, Shrule Bridge

Site A1 was located on the Black River (EPA code: 30B02) at Shrule Bridge, upstream of the proposed development (i.e. an upstream control site). The lowland depositing alkaline river (FW2; Fossitt, 2000) had been extensively deepened and straightened historically resulting in very high, steep banks (c. 4-6m) and a deep U-shaped profile with exposed bedrock and boulder in the margins. The river was 8-9m wide and 0.5-1.2m deep and flowed over limestone bedrock. The flow profile comprised both shallow and deep glide with pool. The bed was moderately calcified and supported frequent large boulders with more localised mixed cobble and pockets of gravels. These were heavily bedded and silted. Filamentous algal cover was moderate, indicating eutrophication pressures. The very rocky, compacted and calcified bed limited macrophyte growth with abundant fool's watercress (*Helosciadium nodiflorum*), common clubrush (*Schoenoplectus lacustris*) and branched bur-reed (*Sparganium erectum*) in the margins only. Larger substrata supported occasional *Chiloscyphus pallescens* on submerged rocks with *Pellia endiviifolia* on the bridge abutments. Wet boulder tops supported *Leptodictyum riparium*, a moss indicative of enrichment pressures. The riparian areas supported scattered mature ash (*Fraxinus excelsior*) and sycamore (*Acer psuedoplatanus*). The banks also supported abundant bramble (*Rubus fruticosus* agg.), hedge bindweed (*Calystegia sepium*), nettle (*Urtica dioica*) and great willowherb (*Epilobium hirsutum*). The site was bordered by improved pasture (GA1) and artificial surfaces (BL3).

Atlantic salmon (*Salmo salar*) (*n*=11), brown trout (*Salmo trutta*) (*n*=4) and stone loach (*Barbatula barbatula*) (*n*=2) were recorded via electro-fishing at site A1 (**Figure 4.1**). The site was a poor to moderate quality salmonid nursery given historical drainage, the predominance of deep glide and pool with limited broken water. Despite poor nursery conditions, a low density of 0+ and 1+ salmon and trout were recorded. Salmonid and lamprey spawning habitat quality was poor overall given the bed was impacted by high siltation and restricted cobble and gravels. Good quality holding habitat for adult salmonids was present in deep pool downstream of the bridge. The site was also considered a good quality European eel habitat given the presence of ample refugia and food resources, although downstream barriers limit the species' passage into the catchment. The bed was too compacted for lamprey ammocoetes and none were recorded. The highly calcareous nature of the river with abundant rocky refugia provided very good potential for crayfish but none were recorded. Otter

spraint was identified under the bridge structure on the concrete plinths and the site provided some moderate quality foraging habitat.

Biological water quality, based on Q-sampling, was calculated as **Q3-4 (moderate status)** (**Appendix B**). 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 Lough Corrib SAC (000297), the aquatic ecological evaluation of site A1 was of **international importance** (**Table 4.4**).

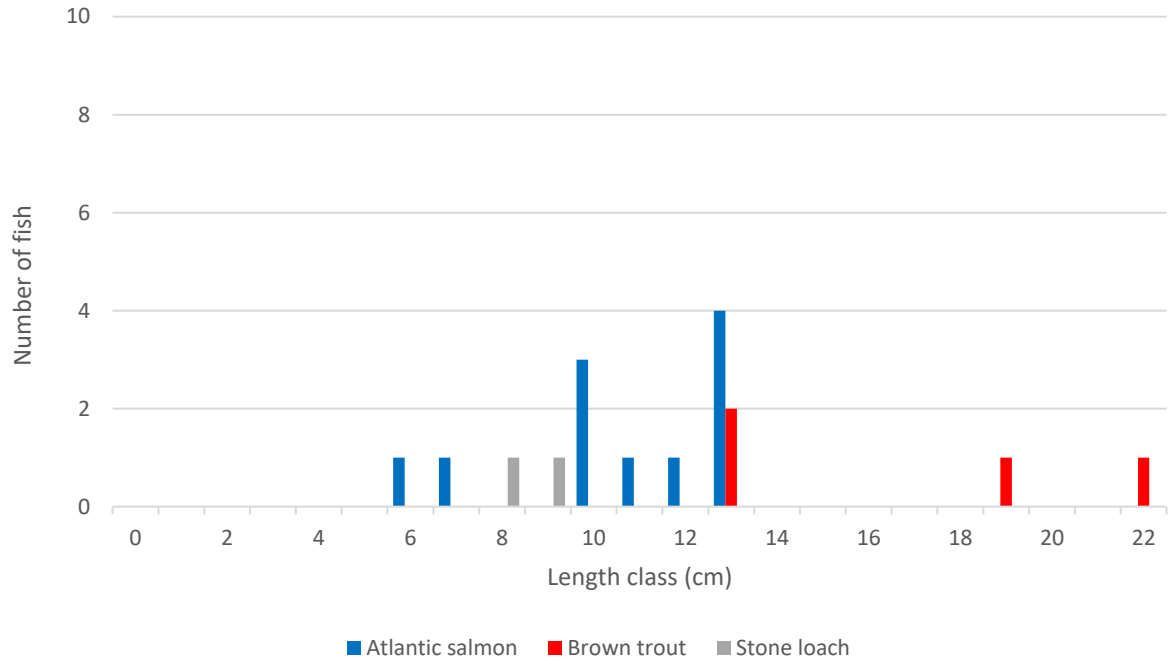


Figure 4.1 Fish length frequency distribution recorded via electro-fishing at site A1, August 2026



Plate 4.1 Adult brown trout recorded at site A1 on the Black River, August 2026



Plate 4.2 Representative image of site A1 on the Black River, August 2026

4.1.2 Site A2 – unmapped channel, Kinlough

Site A2 was located on an unmapped tributary of the Black River adjoining the proposed site boundary. The heavily modified channel had been straightened and deepened historically, resulting in a shallow U-shaped channel with 1m bank heights. The channel was 1-1.5m wide and typically 0.1-0.3m deep with a profile of stagnant pool (i.e. no flowing water). The channel had a soft silt base with localised boulder and cobble. Ponding areas supported profuse growth of fool's watercress and occasional water mint (*Mentha aquatica*). Aquatic bryophytes were not recorded. The scrubby banks supported mature hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and ivy (*Hedera helix*) with bramble in the understories with a limestone wall on the west bank. The site wand wider survey area was bordered by extensive sheep pasture (GA1).

Three-spined stickleback (*Gasterosteus aculeatus*) (*n*=7) and ten-spined stickleback (*Pungitius pungitius*) (*n*=1) were the only fish species recorded via electro-fishing at site A2 (**Figure 4.2**). With the exception of low densities of stickleback, the site and wider channel had very limited fisheries value due to historical drainage (deepening & straightening) and the absence of flowing water. The site was of poor suitability for white-clawed crayfish and none were recorded. No otter signs were recorded in the vicinity of the site with foraging opportunities very limited.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix B**). However, this rating was tentative given poor flows and the absence of suitable riffle areas for sampling (as per Toner et al., 2005). 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 high conservation value, the aquatic ecological evaluation of site A2 was of **local importance (lower value)** (**Table 4.4**).

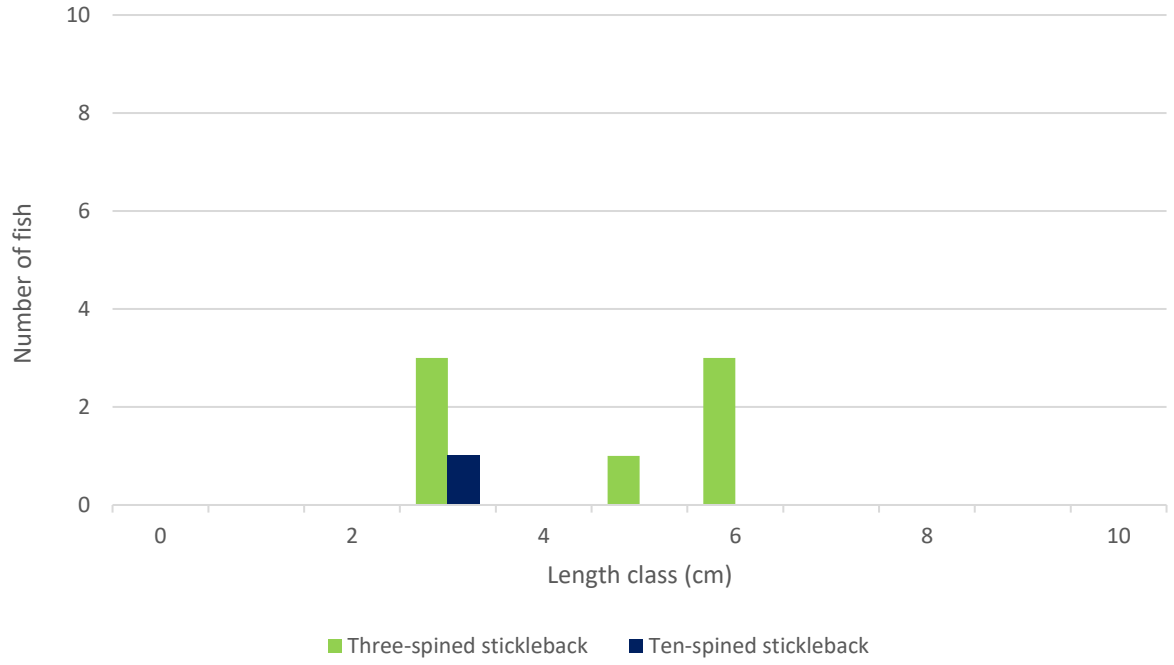


Figure 4.2 Fish length frequency distribution recorded via electro-fishing at site A2, August 2026



Plate 4.3 Representative image of site A2 on an unmapped Black River tributary, August 2026

4.1.3 Site P1 – Pond, Kinlough

Site P1 was located at a small pond within the proposed site boundary. The small (400m^2) circular pond was situated in a deep field hollow and was the mapped source of the Rooaunalaghta Stream. The pond suffered from low summer water levels at the time of survey but was still 1-1.4m deep. Receding water has created steeply sloping very soft margins of exposed mud that supported mats of dried out mare's-tail (*Hippuris vulgaris*) and broad-leaved pondweed (*Potamogeton natans*), the latter species forming large floating mats in the littorals. The site also supported occasional submerged common water starwort (*Callitriche stagnalis*). Common reed (*Phragmites australis*) was also present on the western margin of the pond while fool's watercress was frequent on the outflowing Rooaunalaghta Stream. Common duckweed was locally frequent throughout the pond basin. The presence of lush growth of pondweed and high turbidity supported both enrichment and siltation pressures that reduced the ponds biodiversity value. Evidently, the pond margins had been heavily grazed with exposed eroded soils bounding adjoining heavily improved pastures (GA1).

Electro-fishing was not undertaken at site P1 given the lacustrine conditions. However, the pond had high suitability for European eel given connectivity to the Black River and the species was indeed detected through eDNA sampling (**Table 4.1**). Both three-spined and ten-spined stickleback were recorded during invertebrate sweep sampling. The presence of abundant macrophytic vegetation and the fact the pond retains water even during dry summers indicates a high suitability for smooth newt, with some potential for white-clawed crayfish. However, neither were detected through eDNA sampling. No otter signs were recorded in vicinity of the site despite some foraging opportunities.

No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling (**Appendix A**).

Given the location of the site within the Lower Corrib SAC (000297), the aquatic ecological evaluation of site A3 was of **international importance** (**Table 4.4**).



Plate 4.4 Representative image of pond site P1, August 2026

4.1.4 Site A3 – Rooaunalaghta Stream, Kinlough

Site A3 was located on the Rooaunalaghta Stream (30R03) downstream of site P1 and just upstream of the Black River confluence. The lowland depositing stream (FW2) had been extensively straightened and deepened both historically and more recently. This had resulted in a heavily modified deep U-shaped channel with 2-3m high banks and poor hydromorphology. The stagnant stream was a uniform 2m wide and 0.3m deep with a deep silt/clay base and no hard substrata. Emergent branched bur-reed and fool's watercress were frequent with occasional water mint. Common duckweed (*Lemna minor*) was frequent throughout. Aquatic bryophytes were not recorded. During wetter periods (e.g. winter) the channel would likely support flowing water. The riparian areas supported frequent meadowsweet, silverweed (*Potentilla anserina*), great willowherb, thistles (*Cirsium* spp.), rank grasses and scattered grey willow. The site was bordered by rough, semi-improved pasture (GA1).

Three-spined stickleback (*n*=10) and ten-spined stickleback (*n*=3) were the only fish species recorded via electro-fishing at site A3 (**Figure 4.3**). With the exception of low densities of stickleback, the site and wider channel had very limited fisheries value due to historical drainage. , poor flows and the absence of hard substrata. While the channel had soft sediments that could support lamprey ammocoetes, the bed had a high clay content and both the absence of flows and spawning substrata precluded the species. The site was of poor suitability for white-clawed crayfish and none were recorded. No otter signs were recorded in the vicinity of the site with foraging opportunities limited.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix B**). However, this rating was tentative given poor flows and the absence of suitable riffle areas for sampling (as per Toner et al., 2005). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Despite the low aquatic value, given the location of the site within the Lower Corrib SAC (000297), the aquatic ecological evaluation of site A3 was of **international importance** (**Table 4.4**).

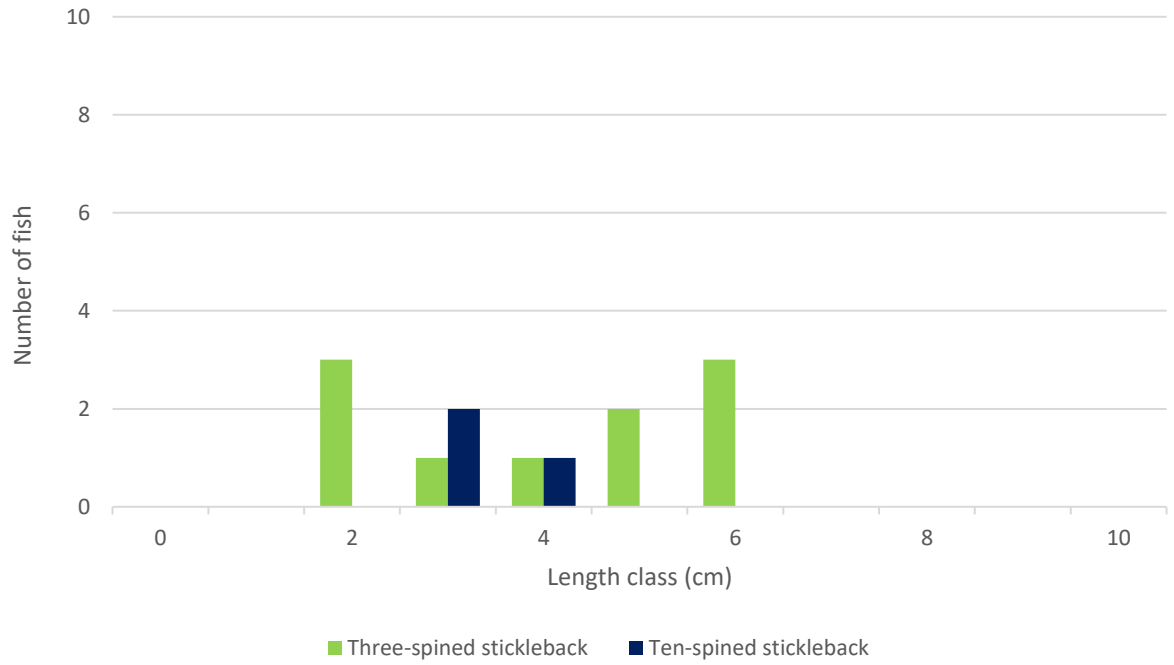


Figure 4.3 Fish length frequency distribution recorded via electro-fishing at site A3, August 2026



Plate 4.5 Female (top) and male three-spined stickleback recorded at site A3, August 2026



Plate 4.6 Representative image of site A3 on the Rooaunalaghta Stream, August 2026

4.1.5 Site A4 – Black River, Moyne Bridge

Site A4 was located on the Black River (30B02) at Moyne Bridge. The lowland alkaline river (FW2) had been extensively deepened and locally realigned resulting in a deep U-shaped channel with high banks of 3-4m. The river suffered from low summer flows and was 7-8m wide and 0.2-0.8m deep, being deepest in the shaded pool downstream of the bridge. The flow profile comprised very slow-flowing glide and pool due to very low summer water levels. The bed was heavily calcified and supported frequent large boulders with more localised mixed cobble and pockets of gravels. These were heavily bedded and silted with frequent calcification. The very rocky, compacted and calcified bed precluded macrophyte growth. However, instream boulders supported abundant *Fissidens crassipes* with frequent *Pellia endiviifolia* and *Riccardia chamedryfolia*. Drier exposed limestone boulders in the channel margins supported frequent *Cinclidotus fontinaloides*, another calcicole species. The liverwort *Chiloscyphus pallescens*[1] was rare. The limestone margins supported abundant trailing *Thamnobryum alopecurum* moss. The river was well shaded by mature treelines of sycamore, ash and hawthorn with ivy and bramble in the understories. The site was bordered by pastures (GA1) outside of the riparian buffers.

Atlantic salmon (*n*=28) brown trout (*n*=35), three-spined stickleback (*n*=3) and stone loach (*n*=1) were recorded via electro-fishing at site A4 (**Figure 4.4**). The site was a very good salmonid nursery despite historical drainage and low summer flows, supporting good densities of both juvenile trout and salmon. The mixed boulder and cobble evidently provided good refugia with high shading minimising summer thermal stress. While spawning habitat was compromised by calcification, localised pockets of gravels and cobble would provide winter spawning. The deeper pool habitat downstream of Moyne Bridge provided good quality holding habitat for adult salmonids. The site was also a good quality

[1] this species replaces *Chiloscyphus polyanthos* in calcareous rivers

European eel habitat given the presence of ample refugia and food resources but downstream barriers limit the species' passage into the Black River catchment. The bed was too rocky and compacted for lamprey ammocoetes and none were recorded. The highly calcareous nature of the river with abundant rocky refugia provided very good white-clawed crayfish habitat but the species was not recorded during targeted surveys or eDNA sampling (**Table 4.1**). Both otter and invasive mink (*Neovison vison*) spraint was recorded under Moyne Bridge. A mink was observed during the survey.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix B**). 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 Lower Corrib SAC (000297), the aquatic ecological evaluation of site A4 was of **international importance** (**Table 4.4**).

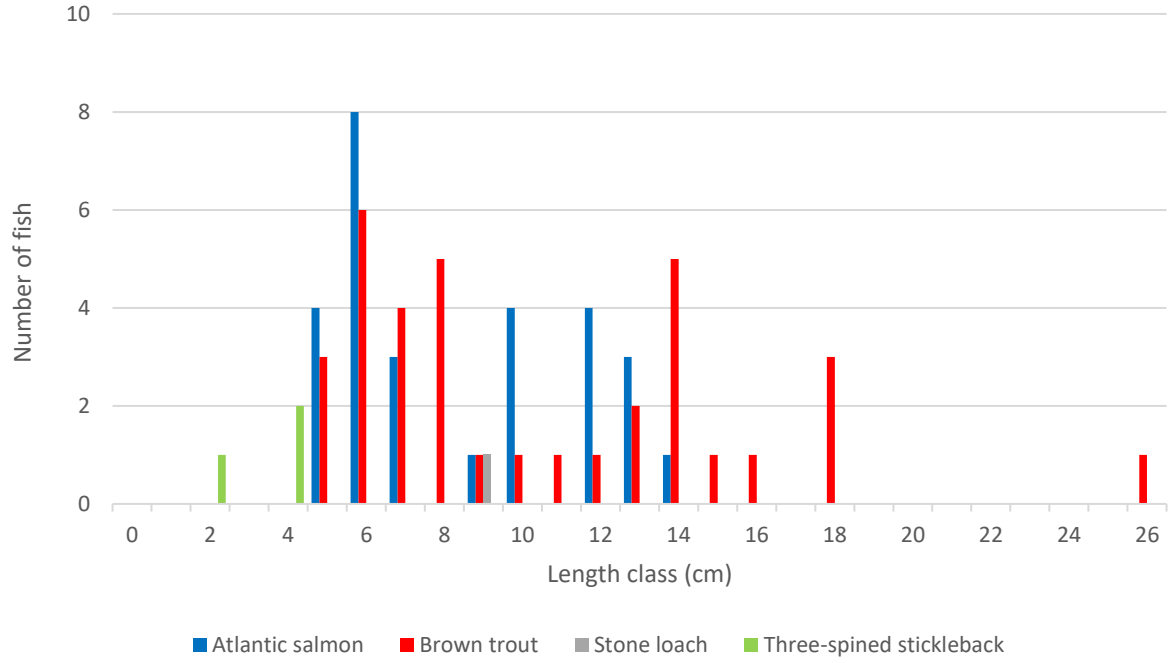


Figure 4.4 Fish length frequency distribution recorded via electro-fishing at site A4, August 2026



Plate 4.7 Atlantic salmon parr recorded at site A4 on the Black River, August 2026



Plate 4.8 Representative image of site A4 on the Black River at Moyne Bridge, August 2026

4.1.6 Site P2 – Pond, Cloghmoyne

Site P2 was located at a small pond adjacent to the proposed site boundary. The small (150m^2) circular shaped pond situated in a shallow field hollow that would support considerably more water during wetter periods (up to 800m^2). The pond had very soft margins of exposed mud and was 0.3-0.5m deep. The bed was composed exclusively of very soft silt with scattered limestone boulders around the margins and along a field boundary wall. The pond was evidently highly enriched with a significant

algal bloom at the time of survey. The pond supported exuberant growth of broad-leaved pondweed with no other macrophytes due to very heavy enrichment and turbidity. The open muddy margins had been heavily poached by cattle and had very dense growth of filamentous green algae. The site was bordered by improved pasture (GA1) with some scattered hawthorn only (i.e. low shading).

Electro-fishing was not undertaken at site P2 given the lacustrine conditions. The small shallow heavily enriched pond was of poor fisheries value given isolation from other habitats, shallow depths and evident water quality pressures. Environmental DNA sampling for white-clawed crayfish, European eel and smooth newt proved inconclusive due to high water turbidity (**Appendix A**). Although some low potential existed for smooth newt (none recorded during sweep sampling), there was no suitability for eel or crayfish. No otter signs were recorded in vicinity of the site with little foraging opportunities.

No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling (**Appendix A**).

Given the absence of aquatic species or habitats of high conservation value, the aquatic ecological evaluation of site B4 was of **local importance (lower value)** (**Table 4.4**).



Plate 4.9 Representative image of pond site P2, August 2026

4.1.7 Site A5 – Cloghmoyne Stream, Moyne

Site A5 was located on the Cloghmoyne Stream (30C80), a small tributary of the Black River downstream of pond site P2. The lowland stream (FW2) had been historically straightened and deepened, resulting in a deep U-shaped to trapezoidal channel. The 2m wide stream was dry at the time of survey following drought conditions. The substrata comprised mixed boulders and cobbles (bedded in mud), indicative of occasional water flows. Due to heavy shading and the absence of water, macrophytes were not present. However, scattered large boulders supported *Chiloscyphus* sp.,

Rhynchostegium riparioides and *Cinclidotus fontinaloides* bryophytes, further indicating occasional water flows. The channel as well shaded by mature hazel (*Corylus avellana*), hawthorn and ash with dense ivy, ferns and scattered bramble along the banks. The site was bordered by semi-improved pasture (GA1).

Electro-fishing was not undertaken at site A5 given the dry nature of the channel at the time of survey. However, there was some physical suitability for salmonids and European eel and would potentially support them under normal flows. The ephemeral site had no value as a white-clawed crayfish habitat. No crayfish remains were recorded, an old otter spraint was identified on boulders under the road culvert.

Given the dry conditions, it was not possible to collected a biological water quality sample.

Given the utilisation by otter (likely highly seasonal), the aquatic ecological evaluation of site A5 was of **local importance (lower value)** (**Table 4.4**).



Plate 4.10 Representative image of site A5 on the Cloghmoyne Stream, August 2026 (dry, ephemeral channel)

4.1.8 Site A6 – Black River, Ower Bridge

Site A6 was located on the Black River (30B02) at Ower Bridge. The lowland alkaline river (FW2) had been extensively deepened and straightened as part of arterial drainage, resulting in a deep U-shaped channel with high banks of 3-4m. Historical embankments were evident along the channel. The river suffered from low summer flows and was 7-8m wide and 0.2-0.6m deep with a profile of mixed riffle and glide. Pool habitat was largely absent. The bed was very heavily calcified and supported frequent large boulders with more localised mixed cobble and pockets of gravels. These were heavily bedded and silted. Filamentous algae cover was also high indicating eutrophication pressures. The rocky,

compacted and calcified bed precluded instream macrophyte growth with water mint, water figwort (*Scrophularia auriculata*), reed canary grass (*Phalaris arundinacea*) and abundant fool's watercress and along the margins only. Further downstream, common clubrush and branched bur-reed became abundant. Aquatic bryophyte cover was high with abundant *Chiloscyphus pallescens* plus frequent *Pellia endiviifolia Fontinalis antipyretica* and *Rhynchostegium riparioides*. The mosses *Fissidens crassipes* and *Moerckia hibernica* were present along the splash zone. The historically modified banks supported scattered mature ash, grey willow, and hawthorn.

Atlantic salmon (*n*=39) and brown trout (*n*=26) were the only fish species recorded via electro-fishing at site A6 (**Figure 4.5**). Despite historical drainage and low summer flows, the site was a very good quality salmonid nursery with abundant instream refugia supporting relatively high numbers of juvenile salmon and trout. Salmonid spawning habitat was present although bed calcification and eutrophication pressures reduced the quality. Deeper glide provided some valuable holding habitat for adult salmonids, especially at higher water levels. The site was also a good quality European eel habitat given the presence of ample refugia and food resources but downstream barriers limit the species' passage into the Black River catchment. The bed was too rocky and compacted for lamprey ammocoetes and none were recorded. The highly calcareous nature of the river with abundant rocky refugia provided very good white-clawed crayfish habitat but the species was not recorded during targeted surveys. Otter spraint (mixed age) was recorded under the bridge structure with good foraging opportunities available.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix B**). 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 Lower Corrib SAC (000297), the aquatic ecological evaluation of site A6 was of **international importance** (**Table 4.4**).

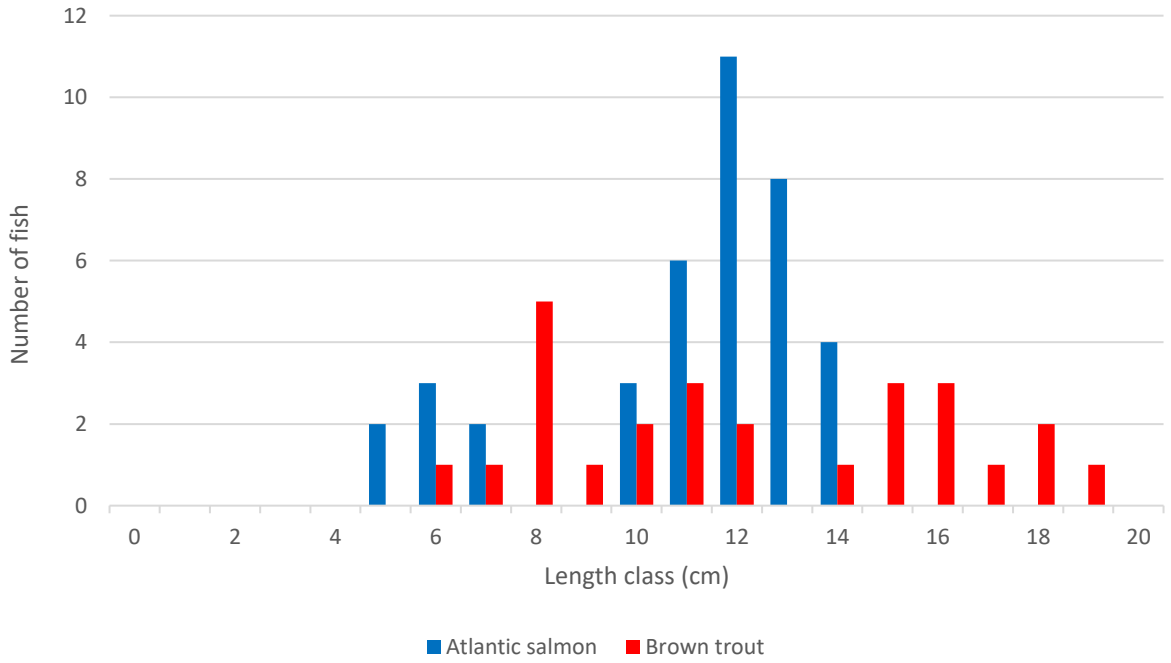


Figure 4.5 Fish length frequency distribution recorded via electro-fishing at site A6, August 2026



Plate 4.11 Brown trout & Atlantic salmon recorded at site A6 on the Black River, August 2026



Plate 4.12 Representative image of site A6 on the Black River, August 2026

4.1.9 Site A7 – Black River, Gortabrack Bridge

Site A7 was located on the lower reaches of the Black River (30B02) at Gortabrack Bridge. As observed upstream, the lowland alkaline river (FW2) had been extensively deepened and straightened as part of arterial drainage, resulting in a deep U-shaped channel with high banks of 2-3m. The river was 10-12m wide and 0.75-1.8m deep with a profile of slow-flowing, deep glide and stagnating pool due to very low summer flows. The bed was heavily calcified and supported bedrock with frequent large

boulders, scattered mixed cobble and pockets of flocculent silt in the margins. The site supported abundant fool's watercress, branched bur-reed and water mint in the softer margins with occasional common clubrush, yellow lily (*Nuphar lutea*), marsh marigold (*Caltha palustris*) and water forget-me-not (*Myositis scorpioides*). Calcified boulders were heavily strewn with the moss *Fontinalis antipyretica* and had very high cover of green filamentous algae. Riparian shading was generally low with scattered mature hawthorn, ash and grey willow with scrubby understories. The site was bordered by improved pasture (GA1).

Electro-fishing was not undertaken at site A7 due to prohibitive depths and water volumes. Due to eutrophication pressures, high macrophyte cover and a high average depth, the site was of low quality as a salmonid nursery. Salmonid spawning habitat was largely absent (sub-optimal where present). However, the deeper glide and pool provided some good quality holding areas for adult salmonids. It was also a good coarse fish nursery area for pike (*Esox lucius*), perch (*Perca fluviatilis*) and roach (*Rutilus rutilus*), species that are also known from the lower Black River (pers. obs.). Adult and juvenile salmonids were observed during the survey (both salmon and trout). The site was a good quality eel habitat given the presence of ample refugia and food resources but downstream barriers limit the species' passage into the Black River catchment. While the site had some suitability for white-clawed crayfish (ample macrophyte & deep pool refugia), none were recorded. Despite evident foraging opportunities, no otter signs were recorded in the vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix B**). However, this rating was tentative low poor flows and the absence of suitable riffle areas for sampling (as per Toner et al., 2005). 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 Lower Corrib SAC (000297), the aquatic ecological evaluation of site A7 was of **international importance** (**Table 4.4**).



Plate 4.13 Representative image of site A7 on the Black River at Ower Bridge, August 2026

4.1.10 Site T1 – Ballisnahyny E turlough, Carrowoughteragh

Site T1 was located at the Ballisnahyny E turlough (NPWS turlough no. 274) and wetland complex adjoining the proposed site boundary. The turlough basin was completely dry at the time of survey following summer drought but supports water during wetter periods (O'Neill & Martin, 2015). Wetter areas supported expansive areas of bottle sedge (*Carex rostrata*) with small stands of common clubrush and lesser-pond sedge (*Carex acutiformis*). These also adjoined large areas of bogbean (*Menyanthes trifoliata*) on damp mud. Water horsetail (*Equisetum fluviatile*), water mint and hairy sedge (*Carex hirta*), branched bur-reed, mare's-tail and water forget-me-not were also locally frequent. The margins supported frequent silverweed, meadowsweet and vetch (*Vicia* spp.) in the drier margins. Large scattered limestone boulders supported abundant *Cinclidotus fontinaloides*, an aquatic bryophyte (thus indicative of occasional submersion). The site was bordered by abundant mature hawthorn and scattered willow marking semi-improved grassland (GA1) boundaries adjoining the dry basin.

As the turlough basin is a seasonal waterbody with small shallow pools of stagnant water only, it was not of fisheries value to fish but could support amphibians in the early spring and summer during wetter years. There was no suitability for white-clawed crayfish. No otter signs were recorded in vicinity of the site with forging opportunities limited or absent.

No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling (**Appendix A**).

Given the rarity and inherently high biodiversity value of seasonal lakes/wetlands/turloughs in Ireland, the aquatic ecological evaluation of site T1 was of **national importance** (**Table 4.4**).



Plate 4.14 Representative image of the mostly dry turlough basin at site T1, August 2026



Plate 4.15 Representative image of the mostly dry turlough basin at site T1, August 2026 (facing west to Ballisnahyny/Ballisnahina Castle)

4.1.11 Site G1 – Black River, Kinlough

Site G1 was located on the Black River (30B02) at a local road and proposed GCR crossing approximately halfway between Shrule Bridge (site A1) and Moyne Bridge (site A4). The lowland alkaline river (FW2) had been extensively deepened and straightened as part of arterial drainage, effectively forming a gorge through the blasted limestone rock. The deeply incised river section

featured very high banks of 4-6m and a deep U-shaped profile. The river suffered from low summer water levels but was 6-7m wide and 0.2-0.8m deep at the time of survey. The profile was dominated by glide with only localised riffle and pool. The bed was moderately calcified and supported frequent large boulders with more localised mixed cobble and pockets of gravels. These were typically heavily bedded and silted but localised clean pockets of coarse gravels existed locally near riffle. The surfaces supported maerl deposits characteristic of heavily calcareous rivers. The very rocky, compacted bed limited macrophyte growth. However, the submerged form of common clubrush was frequent with occasional river water dropwort (*Oenanthe fluviatilis*), yellow lily and unbranched bur-reed (*Sparganium emersum*). Ivy-leaved duckweed (*Lemna trisulca*) was frequent on the bed. Larger instream substrata were heavily strewn with the calcicole liverworts *Chiloscyphus pallescens* and *Pellia endiviifolia*. The splash zones of rocks supported scattered *Fontinalis antipyretica* with frequent *Cinclidotus fontinaloides* on exposed boulder and bedrock. The rocky riparian areas supported mature overhanging hawthorn with ivy and bramble in the understories strewn over the rock faces. The site was bordered by improved pastures (GA1).

Atlantic salmon (*n*=21) and brown trout (*n*=11) were the only fish species recorded via electro-fishing at site G1 (**Figure 4.6**). Despite historical drainage and low summer flows, the site was a valuable salmonid nursery and supported good numbers of juvenile salmon and trout. The mixed boulder and cobble evidently provided good refugia with high shading minimising summer thermal stress. While salmonid spawning habitat was compromised by historical drainage, localised pockets of gravels and cobble provided good opportunities between riffle and pool interfaces. The deeper pool habitat downstream of the bridge provided good quality holding habitat for adult salmonids. The site was also a good quality European eel habitat given the presence of ample refugia and food resources but downstream barriers limit the species' passage into the Black River catchment and none were recorded. The bed was too rocky and compacted for lamprey ammocoetes and none were recorded. The highly calcareous nature of the river with abundant rocky refugia provided very good white-clawed crayfish habitat but the species was not recorded during targeted surveys. Fresh otter spraint containing salmonid remains was recorded on a boulder immediately downstream of the bridge.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix B**). 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 Lower Corrib SAC (000297), the aquatic ecological evaluation of site G1 was of **international importance** (**Table 4.4**).

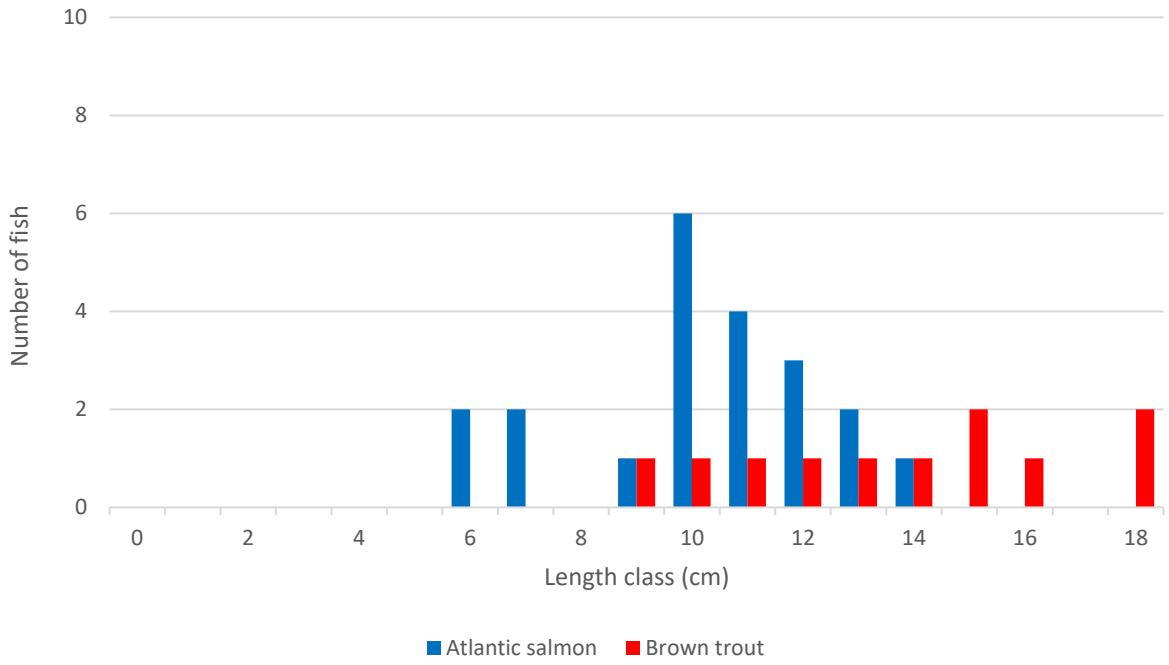


Figure 4.6 Fish length frequency distribution recorded via electro-fishing at site G1, August 2026



Plate 4.16 Representative image of site G1 on the Black River, August 2026

4.1.12 Site G2 – Unmapped channel, L21044 road crossing

Site G2 was located on an unmapped channel at the L21044 local road and proposed GCR crossing. The lowland channel (FW2) had been historically straightened and deepened resulting in a typically homogenous, U-shaped form. The 1.5m wide ephemeral channel was dry at the time of survey with a damp muddy base and showed no signs of regular water conveyance (e.g. abundant leaf litter on the bed). Aquatic vegetation was absent. The channel was heavily shaded/tunnelled by a dense stockproof

hedgerow of ash, hawthorn and bramble. The site and wider survey area was bordered by improved pastures (GA1).

Electro-fishing was not undertaken at site G2 given the dry nature of the channel at the time of survey. However, there was some physical suitability for salmonids and European eel and would potentially support them under normal flows. The ephemeral site had no value as a white-clawed crayfish habitat. No otter signs were recorded in the vicinity of the site with foraging opportunities limited or absent.

Given the dry conditions, it was not possible to collected a biological water quality sample.

Given the absence of aquatic species or habitats of high conservation value, the aquatic ecological evaluation of site G2 was of **local importance (lower value)** (**Table 4.4**).



Plate 4.13 Representative image of site G2 on an unmapped channel, August 2026 (dry, ephemeral channel)

4.1.13 Site G3 – Unmapped channel, L21044 road crossing

Site G3 was located on an unmapped channel at the L21044 local road and proposed GCR crossing. The lowland stream (FW2) had been historically straightened and deepened resulting in a typically homogenous, U-shaped channel. The stream was semi-dry at the time of survey with only remnant shallow pools of stagnant water. The channel was 1.5m wide with 2m bank heights and featured a bed of mixed gravels and mud/silt. The site supported profuse growth of fool's watercress with abundant common duckweed in stagnant pools. Aquatic bryophytes were not present. The channel was bordered by a stockproof hedgerow of ash, hawthorn and sycamore with dense bramble in the understories. The site was bordered by improved pastures (GA1).

No fish were recorded via electro-fishing of stagnant pools at site G3. The semi-dry stream was not of

fisheries value given evident ephemerality/seasonality and poor connectivity to superior fisheries habitats. The ephemeral site had no value as a white-clawed crayfish habitat. No otter signs were recorded in the vicinity of the site with foraging opportunities limited or absent.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix B**). However, this rating was tentative given poor flows and the absence of suitable riffle areas for sampling (as per Toner et al., 2005). 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 high conservation value, the aquatic ecological evaluation of site G3 was of **local importance (lower value)** (**Table 4.4**).



Plate 4.14 Representative image of site G3 on an unmapped channel, August 2026 (semi-dry channel)

4.1.14 Site G4 – Shancloon River, Killamanagh

Site G4 was located on the Shancloon River (30S32) at a local road and proposed GCR crossing. The lowland stream (FW2) had been extensively straightened and deepened historically, resulting in a U-shaped channel with poor hydromorphology along field boundaries. The stream suffered from low summer water levels and only supported localised pools of standing water at the time of survey (i.e. no water flows). The semi-dry stream was 1-1.5m wide with 1.5m bank heights and featured a deep silt bed (no hard substrata). Macrophyte cover was high with abundant fool's watercress and common duckweed in addition to occasional water mint and branched bur-reed. Aquatic bryophytes were not present. The channel was fringed by narrow buffers of low-lying scrub and herbaceous vegetation, with low shading. The site was bordered by extensive heavily improved pasture (GA1).

No fish were recorded via electro-fishing of stagnant pools at site G4. The semi-dry stream was not of fisheries value given evident ephemerality/seasonality and poor connectivity to superior downstream

fisheries habitats. The ephemeral site had no value as a white-clawed crayfish habitat. No otter signs were recorded in the vicinity of the site with foraging opportunities limited or absent.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status)** (**Appendix B**). However, this rating was tentative given poor flows and the absence of suitable riffle areas for sampling (as per Toner et al., 2005). 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 high conservation value, the aquatic ecological evaluation of site G4 was of **local importance (lower value)** (**Table 4.4**).



Plate 4.15 Representative image of site G4 on the Shancloon River, August 2026

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 August 2026. Furthermore, inspection of otter spraint at several sites on the Black River and Cloghmoyne Stream did not reveal the presence of crayfish remains.

Environmental DNA sampling of the Black River or the two pond sites did not detect the species (**Table 4.1**).

4.3 eDNA sampling

No white-clawed crayfish eDNA was detected at site A4 or A7 on the Black River (**Table 4.1, Appendix A**). These results were considered as evidence of the species' absence at and or upstream of the sampling locations. No crayfish eDNA was detected from pond site P1, with the site P2 sample inconclusive. eDNA analysis returned negative results for freshwater pearl mussel at both sites A4 and A7. Strong positive results for lamprey were returned from both watercourses (A4 and A7), while

European eel returned positive results at both sites and at Pond P1, with an inconclusive result at Pond P2. For smooth newt, which was tested for only within the ponds, Pond P1 returned a negative result and Pond P2 returned an inconclusive result (**Table 4.1**).

Table 4.1 eDNA results in the vicinity of the proposed development, August 2026 (positive qPCR replicates out of 12 in parentheses)

Site	Watercourse	White-clawed crayfish	Freshwater pearl mussel	Lamprey (*Lampetra* sp.)	European eel	Smooth newt
A4	Black River, Moyne Bridge	Negative (0/12)	Negative (0/12)	**Positive (11/12)**	**Positive (12/12)**	n/a
A7	Black River, Gortabrack Bridge	Negative (0/12)	Negative (0/12)	**Positive (12/12)**	**Positive (12/12)**	n/a
P1	Pond	Negative (0/12)	n/a	n/a	**Positive (4/12)**	Negative (0/12)
P2	Pond	Inconclusive*	n/a	n/a	Inconclusive*	Inconclusive*

*all samples for site P2 were inhibited by algae/suspended solids and therefore could not be reliably tested under laboratory conditions (Appendix A)

4.4 Biological water quality (macro-invertebrates) & lacustrine 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 9 no. wetted riverine sites or sweep samples from 2 no. pond sites in August 2026 (**Appendix B**).

Site A1 on the Black River (Shrule Bridge) achieved **Q3-4 (moderate status)** water quality (**Figure 4.1**). Despite the presence of the EPA group A mayfly species *Ephemera danica,* this was only recorded in low numbers (<5% of total sample) and thus did not meet the qualifying criteria for good status as set out by Toner et al. (2005).

The remaining 8 no. sites on the Black River (A4, A6, A7, G1), Rooaunalaghta Stream (A3), unmapped channel (G3) and the Shancloon River (G4) achieved **Q3 (poor status)** based on an absence of group A species, low numbers or an absence of group B species and a dominance of pollution-tolerant group C and D species such as freshwater shrimp (*Gammarus duebeni*) and freshwater hoglouse (*Asellus aquaticus*) (**Appendix B**).

It should be noted that the ratings for sites A2, A3, G3 and G4 were tentative due to poor/absent flows and or an absence of riffle areas for sampling at the time of survey (as per Toner et al., 2005). Sites A5 on the Cloghmoyne Stream and G2 on an unmapped channel were dry at the time of survey and thus no macro-invertebrate sample could be collected.

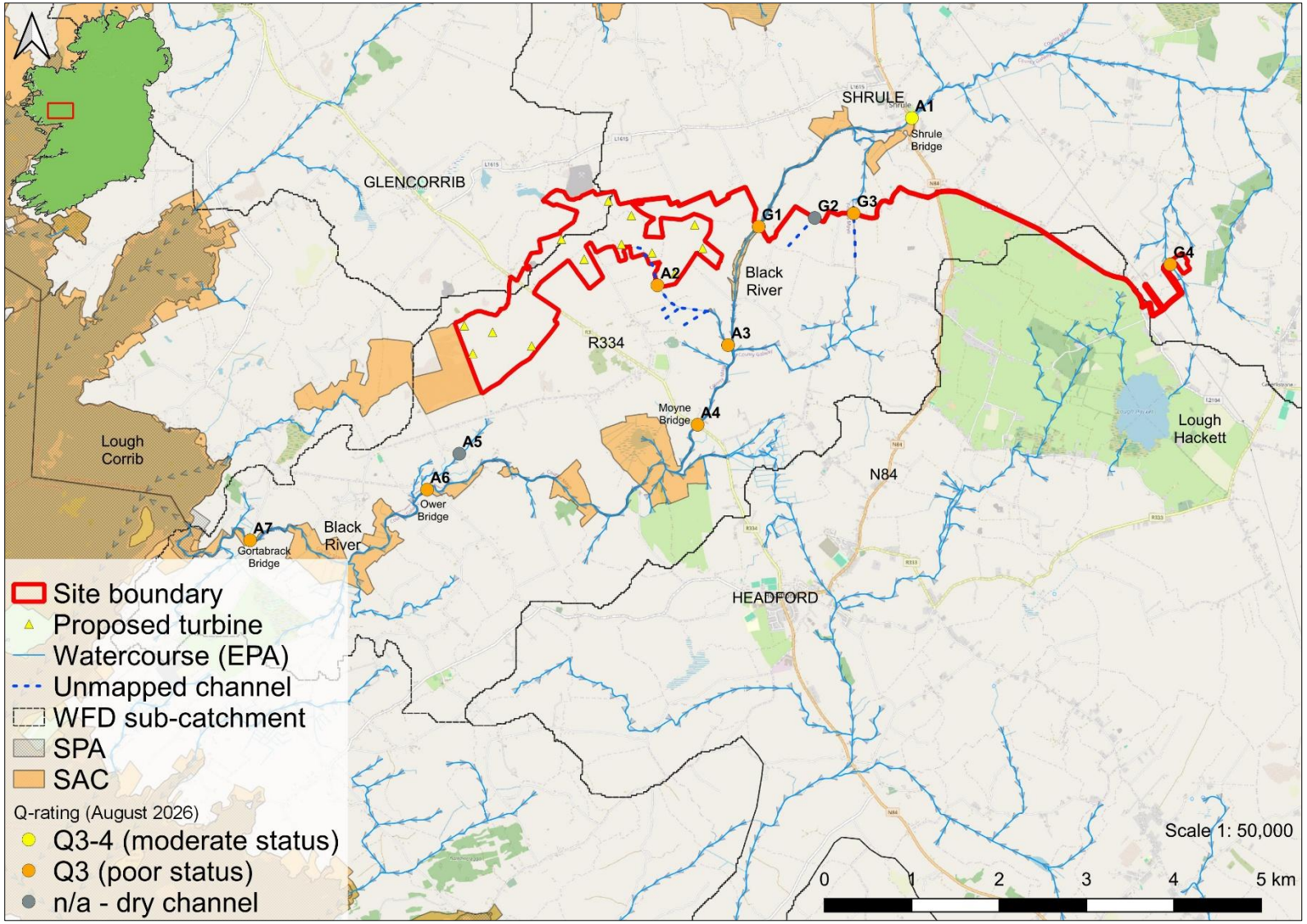


Figure 4.1 Overview of the biological water quality status in the vicinity of the proposed development, August 2026

Table 4.2 Relative abundance of fish species of higher conservation value recorded via **electro-fishing** in the vicinity of the proposed development, August 2026 (blank cell = none recorded)

Site	Watercourse	Atlantic salmon	Brown trout	Lamprey (*Lampetra* sp.)	European eel	Other species
A1	Black River	Medium	Low			Stone loach
A2	Unmapped channel					Three-spined stickleback, ten-spined stickleback
P1	Pond				eDNA only	Fisheries appraisal only. Three-spined stickleback (sweep sampling)
A3	Rooaunalaghta Stream					Three-spined stickleback, ten-spined stickleback
A4	Black River	Medium	Medium	eDNA only	eDNA only	Stone loach
P2	Pond	n/a – fisheries appraisal only				
A5	Cloghmoyne Stream	No fish recorded (dry channel)				
A6	Black River	High	Medium			
A7	Black River	Observed	Observed	eDNA only	eDNA only	Fisheries appraisal only
T1	Ballisnahyny E turlough	No fish recorded (semi-dry turlough)				
G1	Black River	Medium	Medium			
G2	Unmapped channel	No fish recorded (dry channel)				
G3	Unmapped channel	No fish recorded (semi-dry channel)				
G4	Shancloon River	No fish recorded (semi-dry channel)				

Table 4.3 Fish species densities per m^2 recorded, August 2026 (values in **bold** represent the highest densities recorded for each species, respectively)

Site	Watercourse	CPUE (elapsed time)	Approx. area fished (m^2)	Atlantic salmon	Brown trout	Stone loach	Three-spined stickleback	Ten-spined stickleback
A1	Black River	10	150	0.073	0.027	**0.013**	0.000	0.000
A2	Unmapped channel	5	50	0.000	0.000	0.000	**0.140**	0.020
A3	Rooaunalaghta Stream	10	150	0.000	0.000	0.000	0.067	**0.020**
A4	Black River	10	200	0.145	**0.175**	0.005	0.015	0.000
A5	Cloghmoyne Stream	n/a - dry channel		n/a	n/a	n/a	n/a	n/a
A6	Black River	10		220	**0.177**	0.118	0.000	0.000
A7	Black River	n/a - too deep		n/a	n/a	n/a	n/a	n/a
P1	Pond	n/a - appraisal only		n/a	n/a	n/a	n/a	n/a
P2	Pond	n/a - appraisal only		n/a	n/a	n/a	n/a	n/a
T1	Ballisnahyny E turlough	n/a - appraisal only		n/a	n/a	n/a	n/a	n/a
G1	Black River	10	220	0.095	0.050	0.000	0.000	0.000
G2	Unmapped channel	n/a - dry channel		n/a	n/a	n/a	n/a	n/a
G3	Unmapped channel	5	40	0.000	0.000	0.000	0.000	0.000
G4	Shancloon River	5	50	0.000	0.000	0.000	0.000	0.000

Table 4.4 Summary of aquatic species and habitats of higher conservation value recorded in the vicinity of the proposed development, August 2026

Site	Watercourse	White-clawed crayfish	Otter signs within 150m radius	Annex I aquatic habitats	Rare or protected macrophytes/ aquatic bryophytes	Rare or protected macro-invertebrates	Other species/habitats of high conservation value
A1	Black River	None recorded	**1 no. spraint site**	Not present	None recorded	None recorded	**Atlantic salmon recorded**
A2	Unmapped channel	None recorded	None recorded	Not present	None recorded	None recorded	None recorded
P1	Pond	None recorded	None recorded	Not present	None recorded	None recorded	**European eel eDNA detected**
A3	Rooaunalaghta Stream	None recorded	None recorded	Not present	None recorded	None recorded	**Atlantic salmon, *Lampetra* sp.**
A4	Black River	None recorded; negative eDNA	**2 no. spraint site**	Not present	None recorded	None recorded	**Atlantic salmon recorded** **Lamprey (*Lampetra* sp.) and European eel eDNA detected**
P2	Pond	None recorded	None recorded	Not present	None recorded	None recorded	None recorded
A5	Cloghmoyne Stream	None recorded	**Old otter spraint**	Not present	None recorded	None recorded	None recorded
A6	Black River	None recorded	**Regular spraint site**	Not present	None recorded	None recorded	**Atlantic salmon recorded**
A7	Black River	None recorded; negative eDNA	None recorded	Not present	None recorded	None recorded	**Lamprey (*Lampetra* sp.) and European eel eDNA detected**
T1	Ballisnahyny E turlough	None recorded	None recorded	Not present	None recorded	None recorded	None recorded
G1	Black River	None recorded	**Fresh spraint**	Not present	None recorded	None recorded	**Atlantic salmon recorded**
G2	Unmapped channel	None recorded	None recorded	Not present	None recorded	None recorded	None recorded
G3	Unmapped channel	None recorded	None recorded	Not present	None recorded	None recorded	None recorded
G4	Shancloon River	None recorded	None 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'). White-clawed crayfish and otter are protected under the Irish Wildlife Acts 1976-2023. Atlantic salmon are also protected under the Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations and are classed as 'Vulnerable' in Ireland (King et a., 2011). European eel are 'critically endangered' in Ireland (King et al., 2011) and on a global scale (Pike et al., 2020).

Table 4.5 Aquatic ecological evaluation summary of the survey sites according to NRA (2009) criteria

Site no.	Watercourse	EPA code	Evaluation of importance	Rationale summary
A1	Black River	30B02	**International importance**	Located within the Lough Corrib SAC (000297)
A2	Unmapped channel	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value
P1	Pond	n/a	**Local importance (higher value)**	European eel detected via eDNA
A3	Rooaunalaghta Stream	30R03	**International importance**	Located within the Lough Corrib SAC (000297)
A4	Black River	30B02	**International importance**	Located within the Lough Corrib SAC (000297)
P2	Pond	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value
A5	Cloghmoyne Stream	30C80	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry, ephemeral channel)
A6	Black River	30B02	**International importance**	Located within the Lough Corrib SAC (000297)
A7	Black River	30B02	**International importance**	Located within the Lough Corrib SAC (000297)
T1	Ballisnahyny E turlough	n/a	**National importance**	Designated turlough site (by NPWS) with locally high biodiversity value, **not** designated as a Special Area of Conservation (SAC)
G1	Black River	30B02	**International importance**	Located within the Lough Corrib SAC (000297)
G2	Unmapped channel	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry, ephemeral channel)
G3	Unmapped channel	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value
G4	Shancloon River	30S32	Local importance (lower value)	No aquatic species or habitats of high conservation value

5. Discussion

The watercourses surveyed in the vicinity of the proposed wind farm development were typically lowland alkaline channels which had been historically straightened and deepened as part of arterial drainage. Whilst some instream recovery had occurred since the original modifications (1960s), eutrophication and siltation pressures were significant and had impacted aquatic habitats and resulted in a reduction of biological water quality. Low summer flows, very much characteristic of this bedded karstic limestone region, further affected the quality of aquatic and fisheries habitats. Indeed, sites on the Cloghmoyne Stream (A5) and an unmapped stream crossed by the proposed GCR (G2) were completely dry at the time of survey.

Nevertheless, several high conservation value species were recorded during the surveys including Annex II Atlantic salmon, lamprey (*Lampetra* sp.) and otter in addition to Red-listed European eel. A total of six survey sites were of **international importance** given their location with the Lough Corrib SAC (000297), a site with numerous aquatic qualifying interests including Atlantic salmon, brook lamprey (*Lampetra planeri*), white-clawed crayfish, otter and floating river vegetation (3260) (NPWS, 2017) (**Table 4.4**). The Ballisnahyny E turlough, a site officially recognised by the NPWS (but not designated under the Habitats Directive), was considered of **national importance** given the high biodiversity value of seasonal lake sites[2]. Pond site P1 was found to support critically endangered European eel (eDNA sampling) and was of **local importance (higher value)**.

No rare or protected macrophytes/aquatic bryophytes, rare or protected macro-invertebrates, white-clawed crayfish, otter breeding/resting areas, Annex I aquatic habitats or aquatic invasive species were recorded during the current survey. Broadly speaking, the highest value watercourses in terms of aquatic ecology within vicinity of the proposed development were the Black River with small ponds and the Ballisnahyny E turlough also of notable value for aquatic receptors.

5.1 Fisheries

A typical diversity of fish for the surveyed sub-catchment (IFI 2022 data; Kelly et al., 2013; O'Connor, 2007; Byrne et al., 2000) was recorded, with Atlantic salmon, brown trout, stone loach, three-spined stickleback and ten-spined stickleback captured via electro-fishing in August 2026 (**Table 4.2**). Lamprey (*Lampetra* sp.) and European eel were detected through eDNA sampling only. Three of the four watercourse crossings along the proposed GCR (i.e. G2, G3, G4) did not support resident fish at the time of survey with dry or semi-dry/ephemeral conditions. The unnamed tributary of pond site P1 (draining the proposed site boundary) and site A3 on the Rooaunalaghta Stream were found to support only stickleback species.

5.1.1 Salmonids

Salmonids were confined to the Black River, being either captured (electro-fishing), detected (eDNA) and or observed at all five survey locations (A1, A4, A6, A7 & G1). Both Atlantic salmon and brown trout were present at all these sites, with site A6 providing improved nursery habitat despite historical drainage pressures. However, densities of juvenile salmonids were relatively low across the survey area, reflecting the considerable habitat quality pressures such as siltation and hydromorphological

[2] The turlough site has been assessed as being of medium conservation value (O'Neill & Martin, 2015)

modifications. Historical straightening and deepening of watercourses damages habitat and hydromorphological heterogeneity, removes instream structure and refugia, encourages sediment deposition and invariably results in an irreparable reduction in fisheries potential, particularly for salmonids (O'Briain et al., 2019; O'Grady et al., 2017, O'Grady, 2006) but also European eel and lamprey species (King et al., 2015). Nonetheless, the Black River remains an important contributor to the trout population of the downstream Lough Corrib (Delanty et al., 2022b) and as an Atlantic salmon nursery.

5.1.2 Lamprey

No juvenile lamprey (ammocoetes) were recorded during targeted electro-fishing in August 2026 (**Table 4.2**). This primarily reflected the scarcity of appropriate soft sediment nursery habitat in river sites with suitable flows (e.g. Black River), in addition to sub-optimal spawning habitat. Owing to their relatively small morphologies, *Lampetra* species such as brook lamprey require clean, fine gravels in which to dig their redds (Dawson et al., 2015; Rooney et al., 2013; Lasne et al., 2010) although areas may also include fractions of sand, larger gravels, and cobble (Nika & Virbickas, 2010). Spawning habitat was limited and of poor quality due to historical modifications and siltation pressures, in addition to natural bed calcification. Furthermore, lamprey ammocoetes require the deposition of fine, organic-rich sediment ≥5cm in depth in which to burrow and mature (Aronsuu & Virkkala, 2014; Goodwin et al., 2008; Gardiner, 2003). The flocculent soft sediments typically found in the survey area do not provide optimal burial/burrowing habitat for ammocoetes. Nonetheless, lamprey were confirmed in the Black River through eDNA sampling, in keeping with previous data (O'Connor, 2007; Byrne et al., 2000).

Although listed as a qualifying interest for the Lough Corrib SAC (000297), within which much of the survey area is located, sea lamprey (*Petromyzon marinus*) are confined to the lower reaches of the Corrib catchment due to an instream barrier at Galway City (O'Connor, 2007). This would also apply to anadromous river lamprey (*Lampetra fluviatilis*). Thus, any lamprey detected through eDNA sampling in this survey are brook lamprey (*Lampetra planeri*).

5.1.3 European eel

European eel are critically endangered in Ireland (King et al., 2011) and on a global scale (Pike et al., 2020). Despite suitability at most riverine survey sites, European eel were not recorded in the current electro-fishing survey. However, in keeping with available data for the catchment, environmental DNA detected eel on the Black River at sites A4 and A7 (**Table 4.1**). Their eDNA was also recorded from pond site P1, a small waterbody connected to the Black River (but sub-optimal habitat).

Eel densities appear low in the Black[Shrule]_SC_010 river sub-catchment (IFI 2022 data; Kelly et al., 2013). This would largely result from poor hydromorphology and reduced instream habitat heterogeneity resulting from extensive historical modifications, providing a low frequency of suitable refugia (e.g. boulders, pools) required by the species (Laffaille et al., 2003). As eel occurrence decreases significantly with increasing distance from the sea (Degerman et al., 2019), the paucity of eel observed can be further explained by the considerable distance between the survey area and marine habitats of >30km, plus instream barriers (Matondo et al., 2021; Chadwick et al., 2007).

5.2 Absence of white-clawed crayfish

Despite some good habitat suitability and suitable water chemistry (high alkalinity), no white-clawed crayfish were recorded during the targeted surveys, nor through inspection of otter spraint at multiple sites. Environmental DNA sampling of the Black River also failed to detect the species (**Table 4.1; Appendix A**). The findings are in keeping with the lack of available records for the Black[Shrule]_SC_010 sub-catchment. White-clawed crayfish are a qualifying interest of the Lough Corrib SAC which encompasses much of the survey area and are known from the adjacent Clare[Galway]_SC_060 and Corrib_SC_010 river sub-catchments, including the eastern shores of Lough Corrib (**Figure 3.1**).

5.3 Otter signs

Otter signs (all spraints) were identified at four sites on the Black River (A1, A4, A6, G1), the watercourse with the highest otter potential in the survey area. This was due to the presence of ample prey resources, including migratory salmonids. Fish are the primary diet of otter (Krawczyk et al., 2016; Ruiz-Olmo & Jiménez, 2009) and, as otters are food-limited, prey availability is a crucial factor in determining mortality, breeding success and the status of local populations (Sittenthaler et al., 2019; Ruiz-Olmo et al., 2002). Although the Cloghmoyne Stream at site A5 was dry at the time of survey, an old otter spraint site was recorded on boulders under the road culvert. This indicates occasional/seasonal utilisation of this heavily modified Black River tributary, and the likely presence of fish species when conveying water flows.

No otter breeding (holt) or couch (resting) areas were identified in the vicinity of the survey sites in August 2026 surveys with the historically modified and often steep/rocky banks of poor suitability for breeding or resting.

An invasive mink (*Neovison vison*) was observed at site A4 on the Black River (Moyne Bridge). The impact of mink occurrence on otter populations in the survey area is unknown given that the nuances of inter-specific competition between these two species are not yet fully understood, with impacts to otter but more often otter dominance hypothesised (Harrington et al., 2020; García et al., 2020; Melero et al., 2012; McDonald et al., 2007; Bonesi et al., 2004).

5.4 Macro-invertebrates & biological water quality

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the samples taken from a total of 9 no. wetted riverine sites or 2 no. pond sites in August 2026 (**Appendix B**). The samples were typically dominated by pollution tolerant taxa common to Irish rivers impacted by siltation, eutrophication and hydromorphological pressures, such as freshwater shrimp and freshwater hoglouse. Site A1 on the Black River was the only site to support an EPA Group A (most pollution sensitive) species, namely the burrowing mayfly *Ephemera danica*.

Pond sites P1 and P2 supported a moderate macro-invertebrate species diversity with a taxon richness of 16 & 14, respectively. As would be expected for shallow, vegetated, enriched ponds, the communities were dominated by crustaceans, water beetles and damselflies (Coenagrionidae) (**Appendix B**). Stagnant pools at the mostly dry Ballisnahyny E turlough (site T1) supported a good diversity of water beetles although none were rare species.

The non-native amphipod crustacean *Crangonyx* sp. was recorded in low numbers from pond site P2 and the Ballisnahyny E turlough (**Appendix B**). Whilst *Crangonyx pseudogracilis* has been known in Ireland since 1969, its Irish range has expanded in recent years (Minchin et al., 2013) and it is now well established (Baars et al., 2021). Furthermore, *Crangonyx floridanus* has recently been confirmed in the Liffey and Barrow catchments, co-occurring with *Crangonyx pseudogracilis* (Baars et al., 2021). Speciation within the *Crangonyx* genus has proven difficult (Mauvisseau et al. 2018) and could not be determined in the current survey. Although the ecological impacts of either *Crangonyx* species in Ireland remains uncertain (Baars et al., 2021) the species has been shown to be an important dietary component in brown trout in Irish rivers (Delanty et al., 2022).

All riverine sites sampled failed to meet 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**). The biological water quality of the survey area was unsatisfactory (i.e. ≤Q3-4) and typically of poor status (Q3) with significant eutrophication and hydromorphological impacts evidently contributing to a reduction in water quality, in addition to siltation pressures. Agriculture and channelisation are known to be the major water quality pressures within the wider survey area (EPA data) and this was supported by observations made during the aquatic surveys.

6. References

APEM (2024). Rooaunalaghta and Cloughmoyne Wind Farms – Report on Aquatic Ecology Surveys. Report by APEM Ireland for Greensource. July 2024.

APEM (2004). Assessment of sea lamprey distribution and abundance in the River Spey: Phase II. Scottish Natural Heritage Commissioned Report No. 027 (ROAME No. F01AC608).

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.

Aronsuu, K. & Virkkala, P. (2014). Substrate selection by subyearling European river lampreys (*Lampetra fluviatilis*) and older larvae (*Lampetra* spp.). Ecology of Freshwater Fish, 23: 644–655

Baars, J. R., Minchin, D., Freeley, H., Brekkhus, S., & Mauvisseau, Q. (2021). The first record of the invasive alien freshwater amphipod *Crangonyx floridanus* (Bousfield, 1963) (Crustacea: Amphipoda) in two Irish river systems. BioInvasions Record, 10(3), 629-635.

Bonesi, L., & Macdonald, D. W. (2004). Impact of released Eurasian otters on a population of American mink: a test using an experimental approach. Oikos, 106(1), 9-18.

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.

Byrne, C., Igoe, F., Cooke, D., O'Grady, M., & Gargan, P. (2000). The distribution of the brook lamprey (*Lampetra planeri*, Bloch) in the Lough Corrib catchment in the west of Ireland and some aspects of its biology and ecology. *Internationale Vereinigung für theoretische und angewandte Limnologie: Verhandlungen*, *27*(4), 2066-2070.

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.

Chadwick, S., Knights, B., Thorley, J. L., & Bark, A. (2007). A long-term study of population characteristics and downstream migrations of the European eel *Anguilla anguilla* (L.) and the effects of a migration barrier in the Girnock Burn, north-east Scotland. Journal of Fish Biology, 70(5), 1535-1553.

Dawson, H. A., Quintella, B. R., Almeida, P. R., Treble, A. J., & Jolley, J. C. (2015). The ecology of larval and metamorphosing lampreys. In Lampreys: biology, conservation and control (pp. 75-137). Springer, Dordrecht.

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.

Delanty, K., Feeney, R. & Shephard, S. (2022). Fish Stock Survey of the River Liffey 2021. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.

Delanty, K., Bradley, C., O'Grady, M., & Prodöhl, P. (2022b). Population structure and genetic stock identification of the Lough Corrib brown trout. Inland Fisheries Ireland.

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

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.

García, K., Palazón, S., Gosálbez, J., & Melero, Y. (2020). Detection probabilities of the native Eurasian otter and the invasive American mink are independent of their co-occurrence. Mammal research, 65(3), 459-467.

Gardiner, R. (2003). Identifying lamprey. A field key for sea, river and brook lamprey. Conserving Natura 2000 Rivers, Conservation techniques No. 4. Peterborough. English Nature.

Goodwin, C.E., Dick, J.T.A. & Elwood, R.W. (2008). A preliminary assessment of the distribution of the sea lamprey (*Petromyzon marinus* L), river lamprey (*Lampetra fluviatilis* (L.)) and brook lamprey (*Lampetra planeri* (Bloch)) in Northern Ireland. Biology and Environment: Proceedings of the Royal Irish Academy 109B, 47-52.

Harrington, L. A., Birks, J., Chanin, P., & Tansley, D. (2020). Current status of American mink *Neovison vison* in Great Britain: a review of the evidence for a population decline. Mammal review, 50(2), 157-169.

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.

Hodgetts, N.G. & Lockhart, N. (2025). Bryophytes (Mosses, Liverworts & Hornworts). Ireland Red List No. 14. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Dublin, Ireland.

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

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 Western River Basin District. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

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.

King, J. J., Wightman, G. D., Hanna, G., & Gilligan, N. (2015). River engineering works and lamprey ammocoetes; impacts, recovery, mitigation. Water and Environment Journal, 29(4), 482-488.

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.

Krawczyk, A. J., Bogdziewicz, M., Majkowska, K., & Glazaczow, A. (2016). Diet composition of the Eurasian otter *Lutra lutra* in different freshwater habitats of temperate Europe: a review and meta-analysis. Mammal Review, 46(2), 106-113.

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.

Lasne. E., Sabatie, M-R. & Evanno, G. (2010). Communal spawning of brook and river lampreys (*Lampetra planeri* and *L. fluviatilis*) is common in the Oir River (France). Ecology of Freshwater Fish 2010: 19: 323–325.

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.

Mauvisseau, Q., Davy-Bowker, J., Bryson, D., Souch, G. R., Burian, A., & Sweet, M. (2018). First detection of a highly invasive freshwater amphipod (*Crangonyx floridanus*) in the United Kingdom. bioRxiv, 437301.

McDonald, R. A., O'Hara, K., & Morrish, D. J. (2007). Decline of invasive alien mink (*Mustela vison*) is concurrent with recovery of native otters (*Lutra lutra*). Diversity and Distributions, 13(1), 92-98.

Melero, Y., Plaza, M., Santulli, G., Saavedra, D., Gosalbez, J., Ruiz-Olmo, J., & Palazón, S. (2012). Evaluating the effect of American mink, an alien invasive species, on the abundance of a native community: is coexistence possible?. Biodiversity and Conservation, 21, 1795-1809.

Minchin, D., Jażdżewski, K., & Anderson, R. (2013). Further range expansions of two North American amphipods in Ireland. Irish Naturalists' Journal, 13-18.

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.

Nika N. & Virbickas T. (2010). Brown trout *Salmo trutta* redd superimposition by spawning *Lampetra* species in lowland stream. Journal of Fish Biology 77: 2358–2372.

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

O'Connor, W. (2007) A Survey of Juvenile Lamprey Populations in the Corrib and Suir Catchments. Irish Wildlife Manuals No. 26. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

O'Grady, M., Delanty, K., Coghlan, B., O'Briain, R. & Gilligan, N. (2017). River Enhancement Programmes in Ireland. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.

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.

O'Neill, F.H. & Martin, J.R. (2015). Summary of findings from the Survey of Potential Turloughs 2015. Unpublished Report for National Parks & Wildlife Service. Volume I: Main Report.

O'Briain, R., Coghlan, B., Shephard, S., & Kelly, F. L. (2019). River modification reduces climate resilience of brown trout (*Salmo trutta*) populations in Ireland. Fisheries Management and Ecology.

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.

Potter, I. C., & Osborne, T.S. (1975). The systematics of British larval lampreys. Journal of Zoology, 176(3), 311-329.

Rooney, S.M., O'Gorman, N. & King, J.J. (2013). Aspects of brook lamprey (*Lampetra planeri*) spawning in Irish waters. Biology and Environment: Proceedings of the Royal Irish Academy 113B: 1-13

Ruiz-Olmo, J., & Jiménez, J. (2009). Diet diversity and breeding of top predators are determined by habitat stability and structure: a case study with the Eurasian otter (*Lutra lutra* L.). *European Journal of Wildlife Research*, *55*(2), 133.

Ruiz-Olmo, J., Olmo-Vidal, J.M., Mañas, F., Batet, A. (2002). Influence of seasonality of resources on the Eurasian Otter (*Lutra lutra* L.) breeding patterns in Mediterranean habitats. Can J Zool 80:2178– 2189

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.

Went, A.E.J. (1942). Salmon of the River Corrib, together with notes on the growth of brown trout in the Corrib System. In Proceedings of the Royal Irish Academy. Section B: Biological, Geological, and Chemical Science (Vol. 48, pp. 269-298). Royal Irish Academy.

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 – eDNA lab report

Folio No:	4232-2026
Purchase Order:	eDNA-Rooaunalughta
Contact:	Triturus Environmental Ltd
Issue Date:	14.09.2026
Received Date:	04.09.2026

eDNA Report

Technical Report

SureScreen Scientifics

Triturus

Folio No: 4232-2026
Purchase Order: eDNA-Rooaunalughta
Contact: Triturus Environmental Ltd
Issue Date: 14.09.2026
Received Date: 04.09.2026

SureScreen Scientifics

eDNA Analysis

Summary

When aquatic organisms inhabit a waterbody such as a pond, lake or river they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm the presence or absence of the target species within the waterbody.

Results

Lab ID	Site Name	OS Reference	Target Species	Sample Integrity Check	Result	Positive Replicates
FK4008	A7		Freshwater pearl mussel (Margaritifera margaritifera)	Pass	Negative	0
			Brook/River lamprey (Lampetra planeri/ Lampetra fluviatilis)	Pass	Positive	12
			European eel (Anguilla anguilla)	Pass	Positive	12
			White-clawed crayfish (Austropotamobius pallipes)	Pass	Negative	0
FK4039	P1		European eel (Anguilla anguilla)	Pass	Positive	4
			Smooth Newt (Lissotriton vulgaris)	Pass	Negative	0

SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE, UK
+44 (0)1332 292003 | scientifics@surescreen.com | surescreenscientifics.com

Folio No: 4232-2026
Purchase Order: eDNA-Rooaunalughta
Contact: Triturus Environmental Ltd
Issue Date: 14.09.2026
Received Date: 04.09.2026

SureScreen Scientifics

		White-clawed crayfish (Austropotamobius pallipes)	Pass	Negative	0
FK4032	P2	European eel (Anguilla anguilla)	Inhibited Sample	Inconclusive	-
		Smooth Newt (Lissotriton vulgaris)	Inhibited Sample	Inconclusive	-
		White-clawed crayfish (Austropotamobius pallipes)	Inhibited Sample	Inconclusive	-
FK4007	A4	Freshwater pearl mussel (Margaritifera margaritifera)	Pass	Negative	0
		Brook/River lamprey (Lampetra planeri/ Lampetra fluviatilis)	Pass	Positive	11
		European eel (Anguilla anguilla)	Pass	Positive	12
		White-clawed crayfish (Austropotamobius pallipes)	Pass	Negative	0

Matters affecting result: none

Reported by:Katie Harrison

Approved by: Vanessa Hind

SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE, UK
+44 (0)1332 292003 | scientifics@surescreen.com | surescreenscientifics.com

Folio No:	4232-2026
Purchase Order:	eDNA-Rooaunalughta
Contact:	Triturus Environmental Ltd
Issue Date:	14.09.2026
Received Date:	04.09.2026

Methodology

Samples have been analyzed for the presence of target species eDNA following readily available and scientifically published eDNA assays and protocols.

The analysis is conducted in two phases. The sample first goes through an extraction process where the filter is incubated in order to obtain any DNA within the sample. The extracted sample is then tested via real-time PCR (also called q-PCR) for each of the selected target species. This process uses species-specific molecular markers (known as primers) to amplify a select part of the DNA, allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines amplification and detection of target DNA into a single step. With qPCR, fluorescent dyes specific to the target sequence are used to label targeted PCR products during thermal cycling. The accumulation of fluorescent signals during this reaction is measured for fast and objective data analysis. The primers used in this process are specific to a part of mitochondrial DNA only found in each individual species. Separate primers are used for each of the species, ensuring no DNA from any other species present in the water is amplified. If target species DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If target DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent the risk of false positive and false negative results. True positive controls, negative controls, and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared. Stages of the analysis are also conducted in different buildings at our premises for added security. SureScreen Scientifics Ltd is ISO9001 accredited and participates in Natural England's proficiency testing scheme for GCN eDNA testing.

Interpretation of Results

Sample Integrity Check: Laboratory Arrival:

When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results. Any samples which fail this test are rejected and eliminated before analysis.

Degradation and Inhibition check:

Analysis of the spiked DNA marker to see if there has been degradation or inhibition of the kit or sample, between the date it was made to the date of analysis. Degradation of the spiked DNA marker may indicate a risk of false negative results. If inhibition is detected, samples are purified and re-analyzed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: Presence of eDNA (Positive/Negative/Inconclusive)

Positive: DNA was identified within the sample, indicative of species presence within the sampling location at the time the sample was taken or within the recent past.

Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for species presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. Even a score as low as 1/12 is declared positive. 0/12 indicates negative species presence.

Negative: eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of species absence, however, does not exclude the potential for species presence below the limit of detection.

Inconclusive: Controls indicate inhibition or degradation of the sample, resulting in the inability to provide conclusive evidence for species presence or absence.

SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE, UK
+44 (0)1332 292003 | scientifics@surescreen.com | surescreenscientifics.com

8. Appendix B – Macro-invertebrates & biological water quality

Table 8.1 Macro-invertebrate Q-sampling results, August 2026

Group	Family	Species	A1	A2	A3	A4	A6	A7	G1	G3	G4	EPA group
Ephemeroptera	Ephemeridae	*Ephemera danica*	2									**A**
Trichoptera	Cased caddis pupa	sp. indet.		1								**B**
Trichoptera	Goeridae	*Silo pallipes*	1									**B**
Trichoptera	Limnephilidae	*Limnephilus marmoratus*						2				**B**
Odonata	Calopterygidae	*Calopteryx splendens*	11					3				**B**
Odonata	Coenagrionidae	sp. indet.			1						1	**B**
Ephemeroptera	Baetidae	*Baetis rhodani*	4				9	2	3			**C**
Ephemeroptera	Ephemerellidae	*Serratella ignita*	4				9	4				**C**
Trichoptera	Hydropsychidae	*Diplectrona felix*					1					**C**
Trichoptera	Hydropsychidae	*Hydropsyche instabilis*	2					1				**C**
Trichoptera	Hydropsychidae	*Hydropsyche siltalai*							1			**C**
Trichoptera	Polycentropodidae	*Polycentropus kingi*	1					2	1			**C**
Trichoptera	Rhyacophilidae	*Rhyacophila dorsalis*					1					**C**
Coleoptera	Dytiscidae	*Agabus nebulosus*		1								**C**
Coleoptera	Dytiscidae	Dytiscidae larva						1		4		**C**
Coleoptera	Dytiscidae	*Hydroporus palustris*						1				**C**
Coleoptera	Dytiscidae	*Hydroporus tessellatus*		1								**C**
Coleoptera	Dytiscidae	*Ilybius fuliginosus*		1	4						2	**C**
Coleoptera	Dytiscidae	*Nebrioporus depressus*	1			1						**C**
Coleoptera	Elmidae	*Elmis aenea*	5	3			2	1				**C**
Coleoptera	Elmidae	*Limnius volckmari*	3									**C**
Coleoptera	Halipliidae	*Brychius elevatus*	12			4				1		**C**
Coleoptera	Halipliidae	*Haliplus ruficollis*						3				**C**
Coleoptera	Hydraenidae	*Hydraena gracilis*		1							2	**C**
Coleoptera	Hydraenidae	*Limnebius truncatellus*		1								**C**

Group	Family	Species	A1	A2	A3	A4	A6	A7	G1	G3	G4	EPA group
Crustacea	Gammaridae	*Gammarus duebeni*	16	18	11	20	30	20	21	5	12	**C**
Diptera	Psychodidae	sp. indet.							1			**C**
Diptera	Simuliidae	sp. indet.					2		73			**C**
Gastropoda	Bithnyiidae	*Bithynia tentaculata*	4		3			5		3	5	**C**
Gastropoda	Lymnaeidae	*Lymnaea stagnalis*	3		8			4			3	**C**
Gastropoda	Planorbidae	*Planorbis planorbis*	2				2	6				**C**
Gastropoda	Valvatidae	*Valvata piscinalis*						3				**C**
Hemiptera	Corixidae	*Hesperocorixa sahlbergi*		1	2	2						**C**
Hemiptera	Gerridae	sp. indet.	1		2	1	2	1		4		**C**
Hemiptera	Hydrometridae	*Hydrometra stagnorum*			2					1		**C**
Hemiptera	Notonectidae	*Notonecta viridis*		1								**C**
Hemiptera	Veliidae	*Velia caprai*			1							**C**
Crustacea	Asellidae	*Asellus aquaticus*		8	2			2		16	12	**D**
Gastropoda	Lymnaeidae	*Ampullacaena balthica*		1	4	1		1		3		**D**
Gastropoda	Physidae	*Physa fontinalis*	1					3			1	**D**
Hirudinidae	Glossiphoniidae	sp. indet.		1							2	**D**
Diptera	Chironomidae	*Chironomus* spp.	1	2	2	1		1		2	5	**E**
Abundance			**74**	**41**	**42**	**30**	**58**	**66**	**100**	**39**	**45**	**17**
Q-rating			Q3-4	Q3*	Q3*	Q3	Q3	Q3	Q3	Q3*	Q3*	
WFD status			Mod	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	

* tentative Q-rating given the absence of suitable riffle areas for sampling (Toner et al., 2005)

Table 8.2 Lacustrine macro-invertebrate community recorded at pond sites, August 2026

Group	Family	Species	P1	P2	T1
Gastropoda	Lymnaeidae	*Lymnaea stagnalis*	8	2	
Gastropoda	Bithnyiidae	*Bithynia tentaculata*	7		
Gastropoda	Lymnaeidae	*Ampullacaena balthica*	7		
Hemiptera	Notonectidae	*Notonecta viridis*	4	3	
Coleoptera	Dytiscidae	*Ilybius fuliginosus*	3		3
Odonata	Coenagrionidae	sp. indet.	3	11	
Crustacea	Asellidae	*Asellus aquaticus*	2	2	3
Gastropoda	Physidae	Physa fontinalis	2		
Hemiptera	Corixidae	*Corixa sp.*	2		
Coleoptera	Dytiscidae	*Hydroporus palustris*	1		
Coleoptera	Dytiscidae	*Oreodytes sanmarkii*	1		
Crustacea	Gammaridae	Gammarus duebeni	1		
Diptera	Culicidae	sp. indet.	1		
Hemiptera	Gerridae	sp. indet.	1		
Hirudinidae	Glossiphoniidae	sp. indet.	1		
Odonata	Aeshnidae	sp. indet.	1	1	
Annelidae	Oligochaeta	*sp. indet.*		2	
Coleoptera	Dytiscidae	*Hydroporus angustatus*			1
Coleoptera	Dytiscidae	*Hygrotus inaequalis*			1
Coleoptera	Dytiscidae	*Ilybius ater*			1
Coleoptera	Hydraenidae	*Hydraena gracilis*			5
Coleoptera	Hydraenidae	*Ochthebius minimus*			1
Coleoptera	Hydrophilidae	*Anacaena globulus*			1
Coleoptera	Hydrophilidae	*Anacaena limbata*			3
Coleoptera	Hydrophilidae	*Coelostoma orbiculare*			1
Coleoptera	Hydrophilidae	*Cymbiodyta marginella*			1
Coleoptera	Hydrophilidae	*Enochrus coarctatus*			1
Coleoptera	Hydrophilidae	*Helochares punctatus*			1
Coleoptera	Hydrophilidae	*Laccobius bipunctatus*			1
Crustacea	Crangonyctidae	*Crangonyx* sp.		2	12
Diptera	Chironomidae	*Chironomus* spp.		1	
Diptera	Chironomidae	*Non-Chironomus spp.*		2	
Ephemeroptera	Baetidae	*Cloeon simile*		1	
Hemiptera	Corixidae	*Corixa punctata*		1	
Hemiptera	Corixidae	*Corixidae nymph*		2	
Hemiptera	Corixidae	*Hesperocorixa linnaei*		1	
Hemiptera	Corixidae	*Sigara lateralis*		9	
Hemiptera	Nepidae	*Nepa cinerea*			1
Abundance			**45**	**40**	**36**
Taxon richness			**16**	**14**	**15**



Triturus Environmental Ltd.,

Unit 5 Anchor Business Park,

Little Island,

Co. Cork,

T45 XN59.