

Ballyfeeny Green Energy Project



Environmental Impact Assessment Report Volume III

Appendix 6.8 – Fisheries Assessment

September 2025

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Ballyfeeny Green Energy Limited

Ballyfeeny Green Energy Project

Appendix 6.8A: Fisheries Assessment Technical Appendix

September 2025

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1. INTRODUCTION

1.1. Background

Triturus Environmental Ltd. were commissioned by Inis Environmental Consultants Ltd. to undertake a baseline fisheries assessment of riverine watercourses in the vicinity of the proposed Project, inclusive of the proposed grid connection route (GCR), located approximately 6km northeast of Strokestown, Co. Roscommon (Figure 1.1).

1.2. Fisheries asset of the survey area

The aquatic survey sites were located within the Shannon [Upper]_SC_070 and Scramaoge_SC_010 river sub-catchments. The proposed Project and associated infrastructure is not located within a European site. Fisheries survey sites were present on the Culliagh Stream (EPA code: 26C14), Feorish River (26F03), Ballymartin Stream (26B82), Glen Stream (26G38), Gortlustia Stream (26G29), Bellmount Stream (26B99), Curraghroe Stream (26C15) and several unnamed watercourses, in addition to a small quarry pond and Kilglass Lough.

The Culliagh Stream, a tributary of the Feorish River, is known to support Brown Trout (*Salmo trutta*), lamprey (*Lampetra sp.*) and Three-spined Stickleback (*Gasterosteus aculeatus*) (Matson *et al.*, 2018b).

The Feorish also supports Brown Trout and Three-spined Stickleback (Matson *et al.*, 2018b) in addition a range of coarse fish species including Pike (*Esox lucius*), Perch (*Perca fluviatilis*) and Roach (*Rutilus rutilus*) (pers. obs.).

The Curraghroe Stream, located 3.7km south of the GCR and a tributary of the Feorish River is known to support Three-spined Stickleback (Matson *et al.*, 2018b).

Kilglass Lough is a renowned recreationally coarse fishery which supports Pike, Perch, Rudd (*Scardinius erythrophthalmus*), Bream (*Abramis brama*), Roach, Bream hybrids, Tench (*Tinca tinca*) and Eel (*Anguilla anguilla*) (Triturus pers. obs.).

Fisheries data for the other watercourses surveyed as part of this assessment was not available prior to this survey.

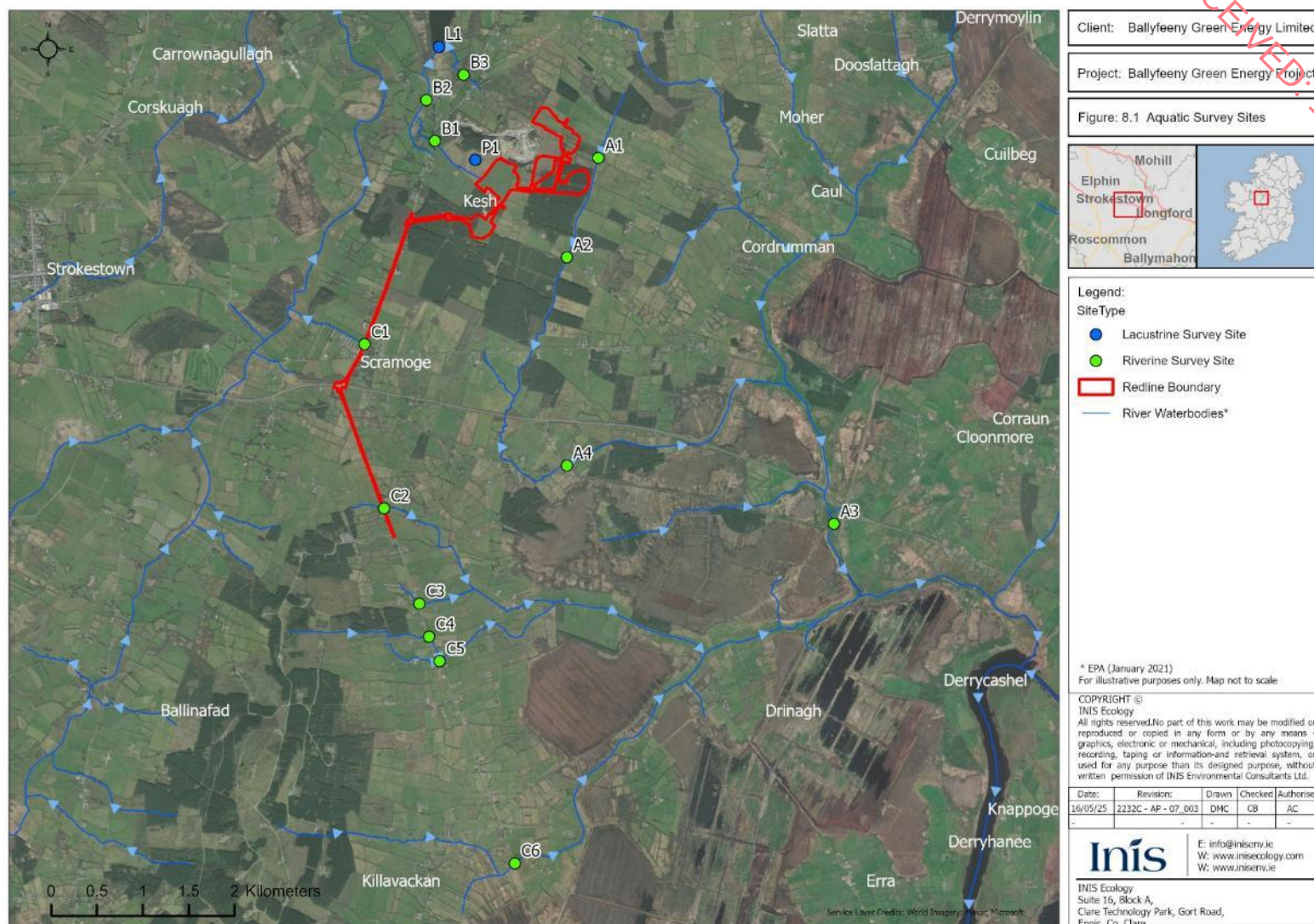


Figure 1.1: Overview of the 15 electro-fishing & fisheries appraisal survey site locations for the proposed Project, Co. Roscommon.

1.3. Statement of Authority

Mr Ross Macklin B.Sc. (Hons) MCIEEM., MIFM, HDip GIS, PDip IPM is an ecologist with over 16 years' professional experience in Ireland. He specialises in freshwater fisheries ecology, biology and water quality. He has considerable experience in a wide range of ecological and environmental projects including EIAR, EcIA, AA/NIS, CEMP reporting, as well as biodiversity, water quality monitoring, invasive species and fisheries management. He also has expert identification skills in macrophytes, freshwater invertebrates, protected aquatic habitats and protected aquatic species including freshwater pearl mussel. His diverse project list includes work on renewable energy developments, flood relief schemes, road schemes, blueways/greenways, biodiversity projects, fisheries management projects and catchment wide water quality management. He is currently completing his Ph.D. on the ecology and impact of Common Carp (*Cyprinus carpio*) in Irish waters.

Mr Bill Brazier B.Sc. (Hons) MIFM is an aquatic ecologist with over 10 years' professional experience in Ireland. He specialises in freshwater fisheries ecology, biology and water quality. He has considerable experience in a wide range of ecological and environmental projects including EIAR, EcIA and AA/NIS reporting, as well as biodiversity, invasive species and fisheries management. His diverse project list includes work on renewal energy developments, flood relief schemes, road schemes, blueways/greenways and biodiversity projects. He is currently completing his Ph.D. on the genetics, reproductive biology and invasive potential impact of Common Carp (*Cyprinus carpio*) in Irish waters. Additionally, Bill runs the highly respected Off the Scale magazine, Ireland's most-read recreational angling publication and is the national coordinator for the novel Anglers National Line Recycling Scheme (ANLRS).

Dr Alex Copland BSc PhD MIEnvSc MCIEEM is Technical Director with INIS. Alex has over 25 years of professional experience working in both statutory and private companies, in third-level research institutions and with environmental NGOs. He is a full member of the Institute of Environmental Sciences (IES) and the Chartered Institute of Ecology and Environmental Management (CIEEM). He is proficient in experimental design and data analysis and has managed several large-scale, multi-disciplinary ecological projects. These have included research and targeted management work for species of conservation concern, the design and delivery of practical conservation actions with a range of stakeholders and end-users, education and interpretation on the interface between people and the environment and the development of coordinated, strategic plans for birds and biodiversity. He has written numerous scientific papers, developed and contributed to evidence-based position papers, visions and strategies on birds and habitats in Ireland. He has supervised the successful completion of research theses for several post-graduate students, including doctoral candidates and is a collaborative researcher with both UCD and UCC. He also sits on the Editorial Panel of the scientific journal, *Irish Birds*, which publishes original ornithological research relevant to Ireland's avifauna, and CIEEM'S *Irish Policy Group*.

2. METHODOLOGY

The survey was undertaken to establish baseline fisheries data used in the preparation of the EIAR for the proposed Project. In order to gain an accurate overview of the existing and potential fisheries value of the riverine watercourses within the vicinity of the project, a catchment-wide electro-fishing survey across 13 riverine sites was undertaken (**Table 2.1; Figure 1.1**). A fisheries habitat appraisal of a small quarry pond site adjacent to the proposed turbine array and the downstream-connecting Kilglass Lough was also completed. Electro-fishing helped to identify the importance of the watercourses as nurseries and habitats for salmonids, Eel and lamprey. The fisheries survey also documented other fish species of lower conservation value and helped to further inform impact assessment and any subsequent mitigation for the project.

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 a catchment-wide electro-fishing survey in the vicinity of the proposed Project site boundary and GCR. The surveys were undertaken on the 13th, 14th and 15th August 2023.

2.1. Fisheries assessment (electro-fishing)

A single anode Smith-Root LR24 backpack (12V DC input; 300V, 100W DC output) was used to electro-fish sites on riverine watercourses in the vicinity of the proposed Project in August 2023 following notification to Inland Fisheries Ireland and under the conditions of a Department of the Environment, Climate and Communications (DECC) licence. The catchment-wide electro-fishing (CWEF) survey was undertaken across 13 riverine sites (see **Table 2.1; Figure 1.1**).

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, 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).

2.1.1. Salmonids and Eel

For salmonid species and 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 wadable streams (Matson *et al.*, 2018). A total of approx. 40-75m channel length was surveyed at each site, where feasible, in order to gain a better representation of fish stock assemblages. At certain sites with limited access (e.g. high average depths), it was more feasible to undertake electro-fishing for a 5-minute CPUE. Discrepancies in fishing effort (CPUE) between sites are described in the results section.

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 Eel to the anode without harm. For the moderate to high conductivity waters of the sites (calcareous geologies) a voltage of 200-250v, frequency of 35-45Hz and pulse duration of 3.5-4ms was utilised to draw fish to the anode without causing physical damage.

2.1.2. 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 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, approximately 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).

Table 2.1: *Location of 15 electro-fishing survey and fisheries appraisal sites in the vicinity of the proposed Project, Co. Roscommon.*

Site no.	Watercourse	EPA code	Location	X (ITM)	Y (ITM)
A1	Culliagh Stream	26C14	Culleenaghmore	599315	782096
A2	Culliagh Stream	26C14	Northyard	598969	781012
A3	Feorish River	26F03	Cloonmore	601882	778105
A4	Culliagh Stream	26C14	Cloonshannagh	598969	778742
P1*	Pond	n/a	Ballyfeeny	597971	782075
B1	Ballymartin Stream	26B82	Ballyfeeny	597532	782282
B2	Ballymartin Stream	26B82	Tully (bridge u/s Kilglass Lough)	597437	782729
B3	Glen Stream	26G38	Tully	597847	783004
L1*	Kilglass Lough	n/a	Kilglass South	597572	783310
C1	Gortlustia Stream	26G29	R371 road crossing	596764	780064
C2	Bellmount Stream	26B99	R371 road crossing	596977	778274
C3	Unnamed stream	n/a	R371 road crossing	597364	777235
C4	Unnamed river	n/a	R371 road crossing	597469	776874
C5	Unnamed stream	n/a	R371 road crossing	597581	776607
C6	Curraghroe Stream	26C15	R371 road crossing	598402	774402

2.2. Fisheries habitat appraisal

A fisheries habitat appraisal of all 15 aquatic survey sites (including lakes) was undertaken to establish their fisheries value. The surveys focused on evaluating the spawning, nursery and or holding habitat for salmonids and lamprey species but also considered Eel and other fish species. The appraisals of salmonids and lamprey were cognisant of species-specific habitat requirements and preferences as outlined in O'Grady (2006), Hendry *et al.* (2003), Armstrong *et al.* (2003), Harvey & Cowx (2003), Maitland (2003) and Hendry & Cragg-Hine (1997). River habitat surveys and fisheries assessments were also carried out utilising elements of the approaches in the River Habitat Survey Methodology (Environment Agency, 2003) and Fishery Assessment Methodology (O'Grady, 2006) to broadly characterise the riverine sites (i.e., channel profiles, substrata etc.).

2.3. 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 Crayfish Plague (*Aphanomyces astaci*). Furthermore, staff did not undertake any work in a known crayfish plague catchment for a period of <72hrs in advance of the survey. Where feasible, equipment was also thoroughly dried (through UV exposure) between survey areas. Any aquatic invasive species or pathogens recorded within or adjoining the survey areas were geo-referenced. All Triturus staff are certified in 'Good fieldwork practice: slowing the spread of invasive non-native species' by the University of Leeds.

3. RESULTS

A catchment-wide fisheries survey of 15 sites in the vicinity of the proposed Project was conducted on the 13th, 14th and 15th August 2023 following notification to Inland Fisheries Ireland. The results of the survey are discussed below in terms of fish population structure, population size and the suitability and value of the surveyed areas as nursery, spawning and or holding habitat for salmonids, Eel, lamprey and other fish species. Scientific names are provided at first mention only. All data are summarised in **Table 3.1**.

3.1. Fisheries assessment & appraisal

3.1.1. Site A1 – Culliagh Stream, Culleenaghmore

Three-spined Stickleback (n=5) and ten-spined stickleback (*Pungitius pungitius*) were the only fish species recorded via electro-fishing at site A1 on the upper reaches of the Culliagh Stream (**Figure 3.1**). With the exception of low densities of stickleback, the site was not of fisheries value given poor flows, poor hydromorphology and poor connectivity with downstream habitats.

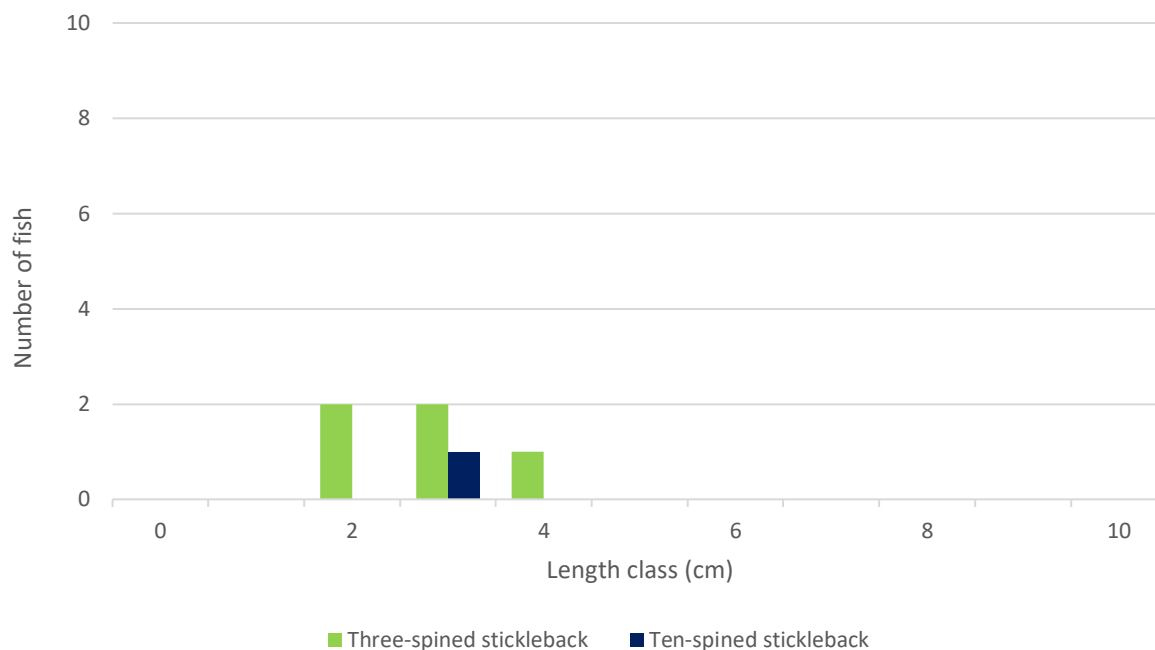


Figure 3.1: Length frequency distribution recorded via electro-fishing at site A1 on the Culliagh Stream, August 2023.



Plate 3.1 Representative image of site A1 on the Culliagh Stream, August 2023.

3.1.2. Site A2 – Culliagh Stream, Northyard

Three-spined Stickleback (n=7) was the only fish species recorded via electro-fishing at site A2 on the Culliagh Stream (**Figure 3.2**).

Despite some moderate physical suitability for salmonids in terms of spawning and nursery habitat, none were recorded. Likewise, despite some suitability for Eel, none were recorded.

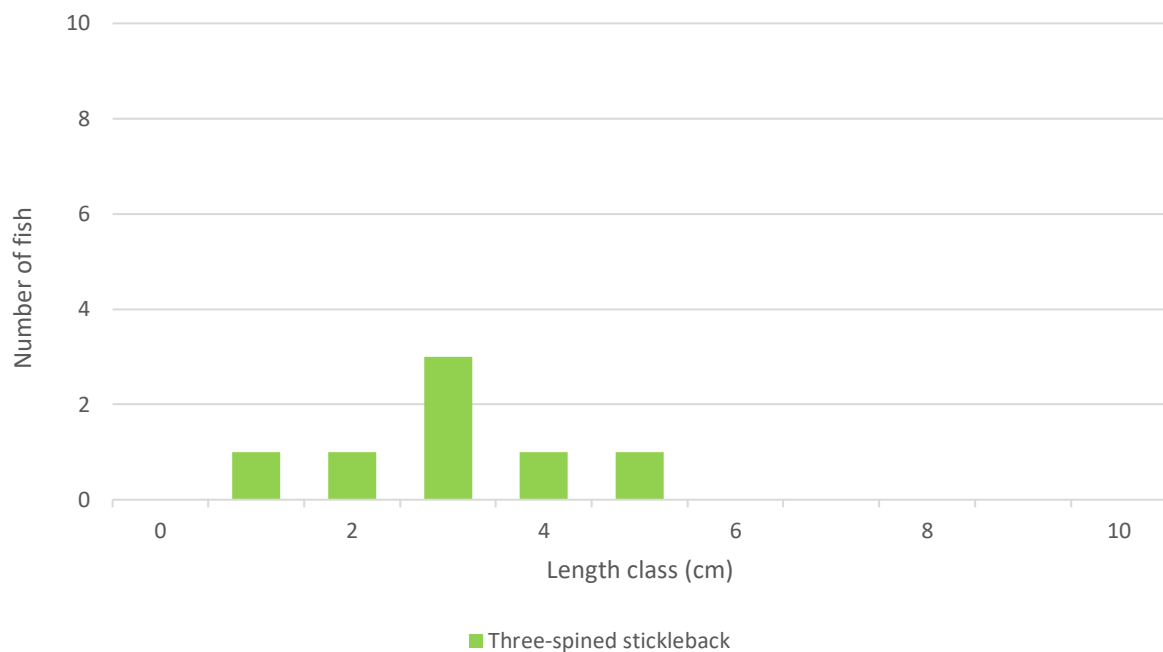


Figure 3.2: Length frequency distribution recorded via electro-fishing at site A2 on the Culliagh Stream, August 2023.



Plate 3.2: *Three-spined Stickleback* recorded at site A2 on the Culliagh Stream, August 2023.

3.1.3. Site A3 – Feorish River, Cloonshannagh

Electro-fishing was not undertaken at site A3 on the lower reaches of the Feorish River due to prohibitive depths of >2m. The deep, homogenous, canalised site was of high value for a range of coarse fish species including Pike, Perch and non-native Roach. There was also good suitability for Eel. The deep channel with poor flows was unsuitable for Lamprey given an absence of suitable spawning areas and limited flow related oxygen transfer to sediments.



Plate 3.3: Representative image of site A3 on the Feorish River, August 2023.

3.1.4. Site A4 – Culliagh Stream, Cloonmore

Lamprey (n=18) and Three-spined Stickleback (n=2) were the only fish species recorded via electro-fishing at site A3 on the Culliagh Stream (**Figure 3.3**).

Despite good suitability for salmonids, none were recorded (as per upstream). However, the site was of good value for lamprey, with good quality spawning habitat present throughout (although compromised by siltation). Whilst localised, high quality nursery habitat was present downstream of the bridge (in sand-dominated soft sediment) and supported a high density of ammocoetes (18 per m²). Despite some suitability for Eel, none were recorded.

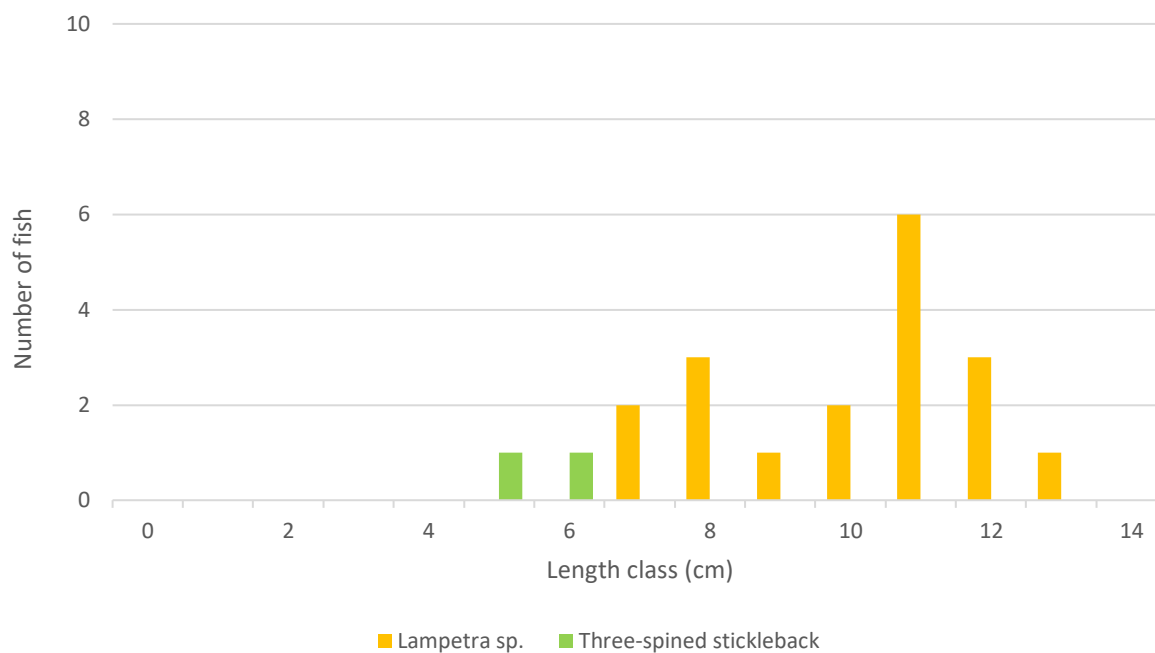


Figure 3.3: Length frequency distribution recorded via electro-fishing at site A4 on the Culliagh Stream, August 2023.



Plate 3.4: Mixed cohort *Lampetra sp.* ammocoetes recorded at site A4 on the Culliagh Stream, August 2023.

3.1.5. Site P1 – Pond, Ballyfeeny

Site P1 was located a disused quarry pond near the proposed turbine array, adjacent to an active quarry. Despite physical suitability, the pond was not of fisheries value given its artificial nature and an absence of connectivity to other aquatic habitats, with no fish recorded. Eel were not detected via eDNA sampling.



Plate 3.5: *Representative image of pond site P1 on, August 2023.*

3.1.6. Site B1 – Ballymartin Stream, Ballyfeeny

No fish were recorded via electro-fishing at site B1 on the upper reaches of the Ballymartin Stream. The site was not of fisheries value given its location in the headwaters of the stream and high natural gradients.



Plate 3.6: Representative image of site B1 on the Ballymartin Stream, August 2023.

3.1.7. Site B2 – Ballymartin Stream, Tully

Three-spined Stickleback ($n=5$) were the only fish species recorded via electro-fishing at site B2 on the Ballymartin Stream (**Figure 3.4**). With the exception of low densities of stickleback, the site was not of fisheries value given poor flows, poor hydromorphology and poor connectivity with downstream habitats.

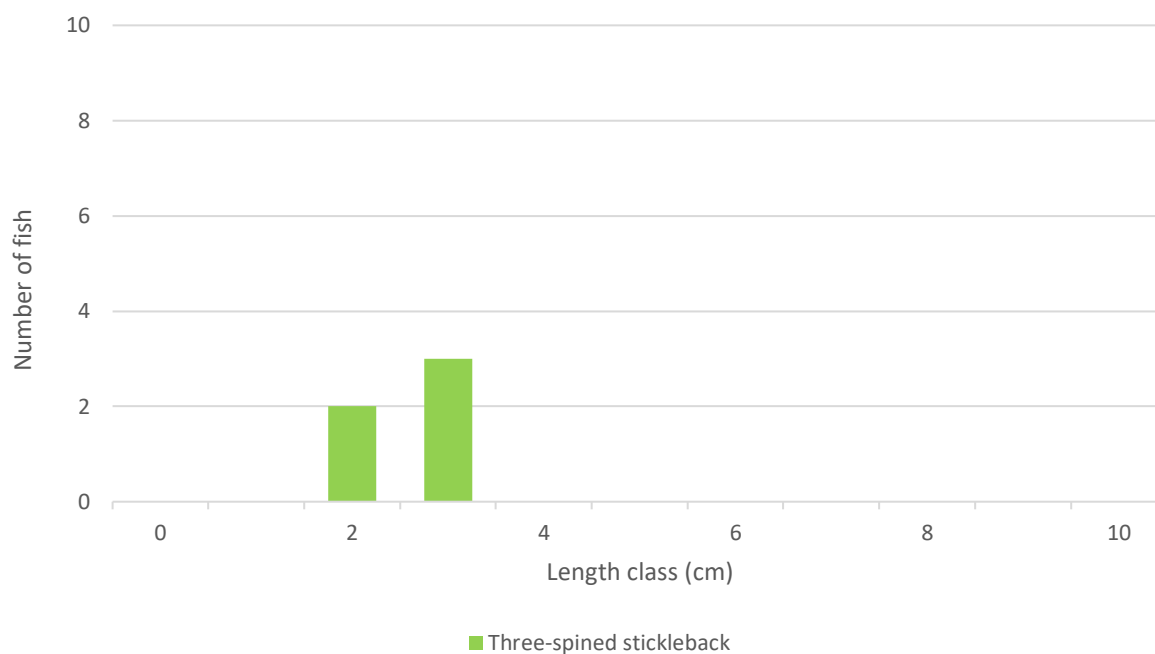


Figure 3.4: Length frequency distribution recorded via electro-fishing at site B2 on the Ballymartin Stream, August 2023.



Plate 3.7: Representative image of site B2 on the Ballymartin Stream, August 2023.

3.1.8. Site B3 – Glen Stream, Tully

No fish were recorded via electro-fishing at site B3 on the Glen Stream. The site was not of fisheries value given its location in the headwaters of the stream, small size, shallow depths and high natural gradient.



Plate 3.8: Representative image of site B3 on the Glen Stream, August 2023.

3.1.9. Site L1 – Kilglass Lough

Site L1 was located at the southern extent of Kilglass Lake where a large elliptical bay of c.25ha was present. Kilglass Lough is known to support a range of coarse fish species, including Pike, Perch, Rudd, Bream, Roach, Bream hybrids and Tench, in addition to Red-listed Eel (*Triturus pers. obs.*).



Plate 3.9: Representative image of site L1 at Kilglass Lough, August 2023 showing extensive fringing reed swamp habitat.

3.1.10. Site C1 – Gortlustia Stream, R371 road crossing

Site C1 was located on the Gortlustia Stream (26G29). The Scramoge River tributary was dry at the time of survey and was thus not of fisheries value.



Plate 3.10: *Representative image of site C1 on the Gortlustia Stream, August 2023 (dry channel).*

3.1.11. Site C2 – Bellmount Stream, R371 road crossing

Despite some low suitability for salmonids, no fish were recorded via electro-fishing at site C2 on the Bellmount Stream. The upper reaches of the small upland stream were of poor suitability for resident fish given the shallow depth and poor flows.



Plate 3.11: *Representative image of site C2 on the Bellmount Stream, August 2023.*

3.1.12. Site C3 – unnamed stream, R371 road crossing

No fish were recorded via electro-fishing at site C3 on an unnamed stream at the R371 road and proposed GCR crossing. The site was not of fisheries value given its location in the headwaters of the stream, historical modifications, siltation pressures, poor flows and poor connectivity with downstream habitats.



Plate 3.12: *Representative image of site C3 on an unnamed stream, August 2023.*

3.1.13. Site C4 – unnamed river, R371 road crossing

Despite some low suitability for salmonids, no fish were recorded via electro-fishing at site C4 on an unnamed river at the R371 road and proposed GCR crossing. The small upland stream was of poor suitability for resident fish due to the shallow depths, limited flows (apart from spate events) and poor connectivity with downstream habitats.



Plate 3.13: Representative image of site C4 on an unnamed river, August 2023.

3.1.14. Site C5 – unnamed stream, R371 road crossing

Three-spined Stickleback (n=13) were the only fish species recorded via electro-fishing at site C5 on an unnamed Curraghroe Stream tributary (**Figure 3.5**). Apart from moderate densities of stickleback, the site was of poor fisheries value. Despite some physical suitability for small salmonids the shallow, modified and silted nature of the stream at the survey location precluded their presence.

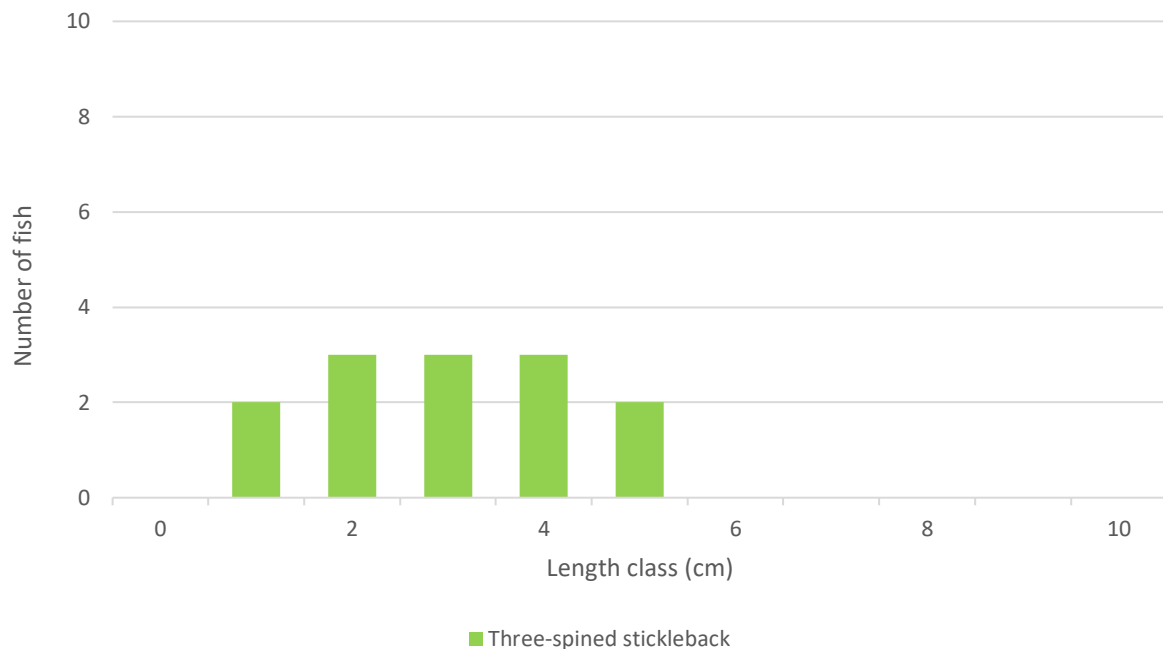


Figure 3.5: Length frequency distribution recorded via electro-fishing at site C5, August 2023.



Plate 3.14: *Representative image of site C5 on an unnamed stream, August 2023.*

3.1.15. Site C6 – Curraghroe Stream, R371 road crossing

Brown Trout (n=1), lamprey (n=4) and Three-spined Stickleback (n=16) were recorded via electro-fishing at site C6 on the Curraghroe Stream (**Figure 3.6**).

The site had good physical suitability as a salmonid and lamprey spawning habitat (abundant mixed gravels). However, the site was a poor-quality salmonid nursery owing to the very shallow glide and riffle and paucity of larger substrata refugia (none recorded). A single adult Brown Trout was recorded from deeper glide under the bridge. Sand accumulations supported a low density of lamprey ammocetes only (2 per m²; sub-optimal conditions). Suitability for Eel was poor and none were recorded.



Figure 3.6: Length frequency distribution recorded via electro-fishing at site C6 on the Curraghroe Stream, August 2023.



Plate 3.15: Three-spined Stickleback and *Lampetra sp. ammocoete* recorded at site C6 on the Curraghroe Stream, August 2023.

Table 3.1: Fish species densities per m² recorded at sites in the vicinity of the proposed Project via electro-fishing in August 2023 (abundances in parenthesis, bold indicates highest density recorded per species).

Fish density per m ²							
Site	Watercourse	CPUE (elapsed time)	Approx. area fished (m ²)	Brown Trout	<i>Lampetra</i> sp.	Three-spined Stickleback	Ten-spined stickleback
A1	Culliagh Stream	5	100	0.000	0.000	0.050 (n=5)	0.010 (n=1)
A2	Culliagh Stream	5	120	0.000	0.000	0.058 (n=7)	0.000
A3	Feorish River	n/a	Too deep for electro-fishing	n/a	n/a	n/a	n/a
A4	Culliagh Stream	10	175	0.000	18 per m² (n=18)	0.011 (n=2)	0.000
P1	Pond	n/a	Fisheries appraisal only	n/a	n/a	n/a	n/a
B1	Ballymartin Stream	10	180	0.000	0.000	0.000	0.000
B2	Ballymartin Stream	5	50	0.000	0.000	0.100 (n=5)	0.000
B3	Glen Stream	5	80	0.000	0.000	0.000	0.000
L1	Kilglass Lough	n/a	Fisheries appraisal only	n/a	n/a	n/a	n/a
C1	Gortlustia Stream	n/a	Dry channel	n/a	n/a	n/a	n/a
C2	Bellmount Stream	5	120	0.000	0.000	0.000	0.000
C3	Unnamed stream	5	20	0.000	0.000	0.000	0.000
C4	Unnamed river	5	100	0.000	0.000	0.000	0.000
C5	Unnamed stream	10	200	0.000	0.000	0.065 (n=13)	0.000
C6	Curraghroe Stream	10	385	0.003 (n=1)	2 per m ² (n=4)	0.042 (n=16)	0.000

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4. DISCUSSION

The watercourses in the vicinity of the proposed Project were small lowland and upland channels which had typically been straightened and or deepened historically, resulting in watercourses with compromised hydromorphology and reduced aquatic value. Furthermore, siltation pressures (from various sources) were evident across much of the survey area. Over half of the riverine survey sites were of low fisheries value with little to no suitability for salmonids, lamprey or Eel, either supporting ubiquitous stickleback species (Ostlund-Nilsson *et al.*, 2006) only (A1, B2, C5) or no resident fish (A1, B1, B3, C1, C2, C3, C4). However, the Curraghroe Stream and Gortgallan River both supported salmonids, with lamprey recorded from the Culliagh Stream. The Feorish River and Kilglass Lough (fisheries appraisal sites) were of high value for coarse fish species, in addition to Eel. A low diversity of fish species – Brown Trout, *lampetra* sp., Three-spined Stickleback and Ten-spined Stickleback – were recorded during the electro-fishing survey (Table 3.1).

Salmonid populations were highly restricted in vicinity of the proposed project, with very low densities of Brown Trout recorded only from sites on the Curraghroe Stream (C6) (electro-fishing). This site provided the best quality salmonid habitat in the survey area, although it was still sub-optimal given historical drainage and siltation pressures which negatively impact nursery and spawning habitat and reduce the availability of holding habitat for adults (O'Grady *et al.*, 2017; O'Grady, 2006). No Atlantic Salmon were recorded during the electro-fishing survey.

Lamprey ammocoetes were recorded from two electro-fishing sites on the Culliagh Stream (A4) and Curraghroe Stream (C6) where sand-dominated soft sediment accumulations supported high (18 per m²) and low densities (2 per m²), respectively. These sites aside, suitability for lamprey was typically poor or absent in the survey area. This was a chiefly a consequence of historical drainage pressures (e.g. bed compaction, poor flows) as well as siltation pressures which have resulted in a paucity of suitable nursery and spawning habitat (as per characteristics provided in Dawson *et al.*, 2015; Aronsuu & Virkkala, 2014; Rooney *et al.*, 2013; Lasne *et al.*, 2010; Goodwin *et al.*, 2008; Gardiner, 2003).

Eel are Red-listed in Ireland (King *et al.*, 2011) and are classed as 'critically endangered' on a global scale (Pike *et al.*, 2020). Despite some physical suitability at numerous sites (e.g. Culliagh Stream), no Eel were recorded via electro-fishing although the species is known to be present in the Feorish River and Kilglass Lough (where high habitat suitability was present). This paucity of Eel in the survey area (and indeed the Upper Shannon catchment; Triturus data) is primarily due to aforementioned downstream barriers in addition to the large instream distance (>170km) from marine habitats which significantly reduces the species' freshwater penetration (Degerman *et al.*, 2019; Chadwick *et al.*, 2007).

5. REFERENCES

- 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.
- Aronsoo, 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
- 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 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 Eel (*Anguilla anguilla*) in running waters: lessons for improved monitoring, habitat restoration and stocking. *Aquatic ecology*, 53(4), 639-650.
- EA (2003). River Habitat Survey in Britain and Ireland: Field Survey Guidance Manual: 2003 Version. Forest Research. Environment Agency, UK.
- 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.
- Gargan, P., Fitzgerald, C., Kennedy, R., Maxwell, H., McLean, S. & Millane, M. (2022). The Status of Irish Salmon Stocks in 2021 with Catch Advice for 2022. Report of the Technical Expert Group on Salmon (TEGOS) to the North-South Standing Scientific Committee for Inland Fisheries. 55 pp.
- 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.
- 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.
- Harvey, J. & Cowx, I. (2003). Monitoring the River, Sea and Brook Lamprey, *Lampetra fluviatilis*, L. *planeri* and *Petromyzon marinus*. *Conserving Natura 2000 Rivers Monitoring Series No. 5*, English Nature, Peterborough.
- IFI (2010). Biosecurity Protocol for Field Survey Work. Available at <http://www.fisheriesireland.ie/Invasive-Species/biosecurity-protocol-for-field-survey-work.html>
- 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.
- 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.
- Maitland, P.S. (2003). Ecology of the River, Brook and Sea Lamprey. *Conserving Natura 2000 Rivers Ecology Series No. 5*. English Nature, Peterborough.
- Matson, R., Delanty, K., Shephard, S., Coghlan, B., & Kelly, F. (2018). Moving from multiple pass depletion to single pass timed electrofishing for fish community assessment in wadeable streams. *Fisheries Research*, 198, 99-108.
- Matson, R., Delanty, K., Gordon, P., O'Briain, R., Garland, D., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., McLoone, P., Morrissey-McCaffrey, E., Brett, T., Ní Dhonnabhain, L. & Kelly, F.L., (2018b). Sampling Fish in Rivers 2017 – Feorish & Hind, Factsheet No. 18. National Research Survey Programme. Inland Fisheries Ireland.
- Niven, A.J. & McCauley, M. (2013). Lamprey Baseline Survey No2: River Faughan and Tributaries SAC. Loughs Agency, 22, Victoria Road, Derry.
- 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'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.
- Ostlund-Nilsson, S., Mayer, I., & Huntingford, F. A. (Eds.). (2006). *Biology of the Three-spined Stickleback*. CRC Press. 404 pp.
- 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: 1-1