Brown Trout Fry Index Surveys in the River Clodiagh Catchment (Suir)



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1. Executive Summary

- The National Brown Trout Programme (NBTP) researches the population dynamics of brown trout to better understand their life cycle as they develop from juveniles into adulthood, providing insight into recruitment of trout stocks.
- The Brown Trout Juvenile Index Monitoring work aims to develop an index for brown trout fry (juveniles aged 0+ years) to measure abundance, spatial distribution within subcatchments and habitat requirements. This index will also provide insights into the recruitment success of juvenile trout to adult stocks. A five-minute timed electrofishing (TEF) protocol was used to monitor abundance and spatial distribution of trout fry in three fry index catchments: Lough Carra, Lough Ennell and the Clodiagh River (a subcatchment the River Suirⁱ). This report summarises 3 years of fry data from electrofishing surveys in the Lough Carra catchment.
- Twenty-three surveys were carried out at 3 sites on the Clodiagh River main channel and 12 sites on 8 of its tributaries in August and September in 2023 and 2024, recording a total of 493 fish. Of the total of 246 brown trout recorded, 220 were designated 0+ fry and 26 trout were designated aged 1+ & older.
- The mean brown trout 0+ fry count per site over the entire catchment was 9.4 fry/5 min in 2023 and 9.7 fry/5 min in 2024. The Cromoge had the highest mean brown trout fry counts across all years surveyed, with 24.5 fry/5 min.
- An increase in fry count from 2023 to 2024 was recorded in the Clodiagh, the Fishmoyne, the Farneybridge, the Aughboy and the Owenbeg tributary, whereas the opposite trend was recorded in the Glashagloragh and the Cromoge.
- Brown trout assigned as 0+ fry spanned the 5–9 cm length classes, whereas brown trout assigned as aged 1+ and older spanned the 11–19 cm length classes.
- The total length frequency distribution shows that the Clodiagh and the Cromoge generally produced relatively higher numbers of trout with a relatively high proportion of trout fry aged 0+.
- The other species recorded comprised, in order of decreasing abundance, Atlantic salmon, three-spined stickleback, stone loach, European eel and lamprey. The Aughboy was the river with the greatest species richness, with 6 species recorded.
- The NBTP aims to continue surveying the Suir Clodiagh catchment annually as part of the brown trout juvenile index programme, these data will be used to inform modelling of fry habitat and factors effecting recruitment to adult stocks.
- Ultimately, monitoring trout fry index in catchments and modelling data on fry abundance annually as part of the brown trout juvenile index programme, these data will be used to inform modelling of fry habitat and factors effecting recruitment to adult stocks.

[†] The Clodiagh River referred to in this report is the Clodiagh River (Tipperary), a subcatchment in the upper reaches of the River Suir west of Thurles, County Tipperary; not to be confused with the Clodiagh River (Portlaw), a subcatchment that joins the lower River Suir in County Waterford.

2. Introduction

The brown trout (*Salmo trutta*) is a native salmonid fish species that is widespread in river systems and lakes throughout Ireland. Brown trout are important, and often predominant, in fish communities in Ireland's freshwater ecosystems. The species is highly variable in appearance and behaviour, and their adaptability means that they can pursue alternative feeding and life-history strategies to survive and thrive in the ecological niches available in rivers. Life-history strategies include remaining resident for their entire life in smaller streams close to where they were born, or migrating from these streams to larger rivers, lakes or even estuaries to exploit richer feeding opportunities elsewhere.

Inland Fisheries Ireland (IFI) and its institutional predecessors (i.e., the Central & Regional Fisheries Boards and the Inland Fisheries Trust) have a long history of scientific research on brown trout, including some foundational research on early life and growth of brown trout (Kennedy & Fitzmaurice, 1968, 1971). This endeavour continues today with the Brown Trout Research Strategy 2021–2025 implemented by the National Brown Trout Programme (NBTP), which outlines areas of research to improve our understanding of the ecology of brown trout and to support trout conservation and management. This includes collecting information on population dynamics to better understand the life cycle of brown trout as they develop from juveniles into adulthood, providing insight into recruitment of trout stocks (National Brown Trout Programme, 2021).

This report summarises the 2023 and 2024 electrofishing surveys targeting brown trout juveniles, known as trout 0+ fry, in the Clodiagh River catchment, as part of the Brown Trout Juvenile Index Monitoring.

2.1 Brown Trout Index Catchments

Index catchments are river catchments that are monitored over time by research programmes as model systems to scientifically investigate specific topics. The NBTP currently surveys three brown trout index catchments, which are all subcatchments of larger systems: Lough Ennell, Lough Carra and the Clodiagh River (Map 2.1):

This report specifically deals with the Clodiagh River and its tributary streams, which were surveyed in 2023 and 2024. This catchment was selected for the following reasons:

- The Clodiagh comprises a major subcatchment of the upper Suir river system, which does not contain sizeable lakes, in contrast with the Carra and Ennell catchments.
- The upper reaches of the Clodiagh provide spawning habitat for the adult trout stocks of the riverine trout fishery on the main channel of the River Suir.
- The Clodiagh contains both brown trout and Atlantic salmon (*Salmo salar*), which will provide insight into the dynamics of trout fry densities in the presence of competition for spawning and nursery habitat.
- The Clodiagh and its tributaries rise at a higher elevation, drain more upland areas and comprise a denser network of streams up to 4th order compared with the Carra and Ennell catchments.



Map 2.1: Geographic location of brown trout index catchments surveyed by the NBTP (scale 1:240,000); rivers ≥1st order and lakes in the index catchments in blue; all other rivers ≥3rd order and lakes outside index catchments in grey.

2.2 Study Area: The Clodiagh River Catchment

The Clodiagh River catchment consists of about 284 kilometres of river channel, ranging from tiny 1st order headwater streams to a large 5th order river where the Clodiagh joins the River Suir about 10 kilometres southwest of Thurles, County Tipperary. The Clodiagh River and one of its main tributaries, the Owenbeg River, rise in the easternmost foothills of the Slieve Felim Mountains, whereas two other major tributaries, the Cromoge River and the Fishmoyne River, rises to the north on the southern slopes of the Devil's Bit Mountain. These headwaters flow over high to moderate gradient terrain, but the main channel of the Clodiagh and the Fishmoyne meander through a wide, gently sloping valley south of Pallas Bridge and Borrisoleigh, respectively. The low-lying land to the east of the main channel of the Clodiagh is drained by the Farneybridge River.

The lower reaches of the main channel of the Clodiagh and its tributary the Owenbeg are part of the Lower River Suir Special Area of Conservation (SAC), which is designated for the conservation of several priority habitats and Annex II species of the Habitats Directive (National Parks & Wildlife Service, 2023), including the fish species Atlantic salmon and brook/river lamprey (*Lampetra* sp.) found in the Clodiagh subcatchment (O'Connor, 2007). The Owenbeg River is also a registered protected area for abstraction of water intended for human consumption under the Water Framework Directive (WFD) (Environmental Protection Agency, 2018).

The Clodiagh catchment has contrasting terrain and geology between its eastern and western halves. To the east, the Farneybridge River drains low-lying land mostly covered with well-drained, loamy mineral soils, interspersed with alluvium and peaty soils; the subsoils are primarily glacial till derived from limestones (Environmental Protection Agency & Teagasc, 2024; Geological Survey Ireland, 2024b). In contrast, the upper reaches of the Clodiagh and its main tributaries to the west drain upland areas covered with well-drained acid mineral soils and poorly drained gleys, whereas their lower reaches drain well-drained, loamy mineral soils over sandstones; the subsoils are primarily glacial till derived from sandstones. The bedrock to the east of the Clodiagh consists of limestone from the Carboniferous period, whereas the upland areas to the west are sandstones, conglomerates and other siliceous rocks primarily from the Silurian period (Geological Survey Ireland, 2024a).

A baseline fisheries survey of the River Suir catchment, including the Clodiagh, in 1983–1985, confirmed the Suir's importance for both trout and salmon. Subsequent surveys in 2004–2005 (O'Grady & Delanty, 2006) found widespread and substantial populations of trout 0+ fry in the Cromoge, Owenbeg and Clodiagh rivers, indicating that the Clodiagh subcatchment is very important for trout spawning; however, less 1+ or older brown trout caught than expected indicated that these rivers had a moderate value as nursery habitat. Other species present included Atlantic salmon, European eel (*Anguilla anguilla*), lamprey, stone loach (*Barbatula barbatula*), three-spined stickleback (*Gasterosteus aculeatus*), minnow (*Phoxinus phoxinus*) and gudgeon (*Gobio gobio*). In 2016, the Cromoge were electrofished by boat for WFD reporting (Kelly *et al.*, 2017); trout, minnow and stone loach were recorded, and the fish ecological status was designated as Poor.

Population genetic analysis indicates that, like other subcatchments of the Suir, the trout population of the Clodiagh has its own distinct genetic make-up, and it contributes approximately 10% to the trout stocks of the main channel of the Suir (Massa-Gallucci & Mariani, 2011). This work also confirmed that almost all of the adult trout targeted by anglers in the Suir originates from the major tributaries and that young trout that enter the Suir from subcatchments such as the Clodiagh are as likely to travel upstream or downstream, forming a mixed fishery (Massa-Gallucci & Mariani, 2011).

The land use in the catchment is dominated by agricultural pasture, with some areas of arable land to the east, and with more extensive areas of coniferous and mixed forestry in the upland areas to the west, with the village of Borrisoleigh on the Cromoge River comprising an area of discontinuous urban fabric (Environmental Protection Agency, 2024a). There have been local programmes of drainage works in the Clodiagh catchment in the past, especially in the Cromoge and the Farneybridge, leaving a lack of natural hydromorphological features in many reaches with low gradient (O'Grady & Delanty, 2006). According to WFD risk assessment for the Fishmoyne sub-basin, the significant issues are nutrients and sediment arising from a combination of the pressures of agriculture, forestry and land drainage, with invasive species and diffuse urban run-off also significant on the Cromogeⁱⁱ (Environmental Protection Agency, 2019c, 2024b). A key issue in the Farneybridge sub-basin is channelisation, which is a significant hydromorphological pressure and has degraded available habitat (Environmental Protection Agency, 2019a, 2024b).

Water quality and ecological status are generally better overall in the Clodiagh and its tributaries in the upland areas in the west of the catchment, although siltation due to forestry is possibly a significant pressure in the upper reaches of the Clodiagh (Environmental Protection Agency, 2019b).

Nine rivers in the Clodiagh catchment were sampled by the NBTP, comprising a network with a total channel length of 248.10 km and draining a catchment of 258.18 km² (Map 2.2; Table 2.1):

- The main channel of the Clodiagh, along with its tributary stream the Glashagloragh
- The Fishmoyne and its tributary the Cromoge in the north around Borrisoleigh
- The Farneybridge in the low-lying part of the catchment just west of Thurles
- The Marlow and the Aughboy in the south around Clonoulty and Drumbane, respectively
- The Owenbeg and one of its small tributaries, which rise near Upperchurch

ⁱⁱ The Cromoge is also known as the Borrisoleigh Stream in WFD reporting.



Map 2.2: Sites surveyed in the Clodiagh River fry index catchment, 2023–2024

	, ,		•			
Мар Кеу	River Name	Site	Latitude	Longitude	Segment Code	WFD RWB Code
01	Clodiagh	Annfield Bridge	52.71027	-7.9396	16_508	SE_16C020200
02	Clodiagh	Rathcardan Bridge	52.72798	-7.9899	16_1316	SE_16C020080
03	Clodiagh	Gorteennabarna Bridge	52.73742	-8.02838	16_570	SE_16C020040
04	Cromoge	Ballyroan Bridge	52.75747	-7.97122	16_3623	SE_16B060600
05	Fishmoyne	Rathmoy Bridge	52.74244	-7.92959	16_3860	SE_16F030200
06	Fishmoyne	Fishmoyne Bridge	52.75846	-7.92759	16_3932	SE_16F030200
07	Fishmoyne	bridge in Brookley	52.76547	-7.91227	16_3030	SE_16F030200
08	Farneybridge	d/s Farney Bridge	52.67261	-7.90192	16_10635	SE_16F020700
09	Farneybridge	Ballynahow Bridge	52.68851	-7.87347	16_4165	SE_16F020500
10	Farneybridge	d/s bridge on R498	52.70722	-7.89395	16_10632	SE_16F020500
11	Marlow	Marlow Bridge	52.6233	-7.9782	16_769	SE_16F200470
12	Aughboy	d/s road bridge	52.6484	-7.95255	16_879	SE_16C020600
13	Owenbeg	100 m u/s Ballyoughter Bridge	52.65992	-7.94523	16_10683	SE_16O020700
14	Owenbeg tributary	Pendye's crossroads	52.69836	-8.02111	16_1439	SE_16O020700
15	Glashagloragh	d/s landbridge	52.71015	-7.94402	16_3204	SE_16C020200

Table 2.1: Key to Map 2.2 of sites surveyed in the Clodiagh River fry index catchment, 2023–2024.

3. Methods

3.1 Semi-Quantitative Electrofishing

Electrofishing is a well-established tool for monitoring freshwater fish communities in streams and rivers (Bohlin *et al.*, 1989). Electrofishing equipment passes an electric field through the water from a cathode to an anode, causing the muscles of fish caught in the field to spasm, which prevents them from swimming effectively, turns them towards the anode and allows them to be captured with a hand-net. Electrofishing allows non-lethal sampling and monitoring of fish communities, which provides information on abundance, distribution, length frequency and age structure of fish populations in rivers.

The IFI R&D Division designs its electrofishing protocols in compliance with European standards for fisheries assessment (European Committee for Standardization, 2003, 2006), and fish welfare is always the highest priority when conducting electrofishing operations, which are carried out using the most appropriate electrical settings to effectively and safely catch fish without causing fatalities or harm. One protocol used by IFI is timed electrofishing (TEF), which involves electrofishing a stretch of river without stop nets in a single pass for a timed interval. TEF requires relatively less investment of time and effort per site, allowing more sites across a catchment to be sampled. The use of a standard time interval in TEF allows a minimum estimate of the fish population based on only one pass that can be compared across sites fished with the same method.

Semi-quantitative TEF methodologies have been developed to allow rapid assessments of fish populations over catchments. A semi-quantitative five-minute electrofishing technique targeting 0+ juvenile salmon (Crozier & Kennedy, 1994: Gargan *et al.*, 2008) is currently used across Ireland to support assessment of salmon stocks (Holmes *et al.*, 2023).

3.2 NBTP Five-Minute TEF Protocol

The five-minute TEF protocol adopted by the NBTP for assessing juvenile trout abundance and developing a trout fry index in brown trout index catchments is similar to the Catchment Wide Electrofishing (CWEF) protocol (Holmes *et al.*, 2023). Key criteria of its design include the following:

- In advance of sampling, potential sites are mapped and inspected to assess their suitability as trout habitat, their accessibility for survey work and their spatial distribution around the catchment to ensure adequate sampling of all significant tributaries where possible.
- Sites that were surveyed by IFI in the past were targeted initially, with additional sites included where suitable trout spawning habitat was identified.
- Sites in streams and rivers are selected to include typical juvenile trout habitat, generally stretches of stream that included riffles and areas with gravelly substrate suitable for trout spawning.
- Yearly repeat visits to a site aim to replicate the original survey by fishing the same type of habitat at the same location, and as close as possible to the same date.

- Two operatives fish continuously in an upstream direction using a single anode electrofishing apparatus (either backpack or bankside generator) for five minutes in the absence of stop nets, catching all fish "turned" by the electric current where possible (Figure 3.1).
- In addition to fish captured, fish that are seen but not captured are counted and added to the total, with an estimation of life stage (0+ fry or 1+ & older) for any trout or salmon not captured.
- Fish processing involves identifying species caught, enumerating number of individuals captured and measuring their length to establish age classes present at the site. Fork length is measured in length classes, e.g. fish measuring ≥5.0 cm and <6.0 cm are in the 5 cm length class, etc.
- Fish caught were usually identified to species level, except for lamprey; these comprise brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*), juveniles of which are difficult to distinguish in the field.
- Scales samples may be taken for investigating age and growth if required and for potential future genetic studies.
- Fish species present other than trout are also recorded and enumerated. The presence/absence of the protected invertebrates white-clawed crayfish (*Austropotamobius pallipes*) and freshwater pearl mussel (*Margaritifera margaritifera*) is also recorded.
- Following processing all fish caught are then monitored for a short period to ensure their recovery and released back into the site.

Sites with good juvenile trout habitat were selected, with a particular focus on riffle sections, which provide good nursery waters for trout fry (Armstrong *et al.*, 2003). The protocol aims to sample enough sites across a catchment to gain a representative picture of the trout fry distribution and abundance in each catchment.

3.3 Habitat Survey

Immediately after each electrofishing survey at a site, a habitat survey was carried out to record the site's physical characteristics, riparian & instream habitat, water quality, etc. This information is vital to allow ecological integrity of sites to be evaluated and will be used in modelling of juvenile trout habitat. Parameters recorded include the following:

- GPS co-ordinates to record site location and confirm accurate surveys on repeat visits.
- Physical features, such as wetted width, depths, channel widths, flow conditions, etc.
- Water quality, such as temperature, conductivity, algae levels, water clarity, etc.
- Habitat characteristics, such as substrate, type of habitat, instream vegetation, fish cover, etc.
- Riparian features, such as bank characteristics, land-use, bank vegetation, erosion, etc.
- Channel pressures, such as straightening, widening, sediment, livestock access, etc.
- Habitat suitability for trout life stages (fry, juveniles & adults)
- Hydromorphological channel features, such as gravel bars, berms, etc.



Figure 3.1: Electrofishing a river site.

4. Results

The NBTP implemented its five-minute TEF protocol targeting 0+ brown trout fry in 23 surveys at 3 sites on the Clodiagh River main channel and 12 sites on 8 of its tributaries in August and September in 2023 and 2024. The surveys captured a total of 493 fish, comprised of 246 brown trout and 247 other fish from 5 other speciesⁱⁱⁱ. The brown trout comprised 220 brown trout fry aged 0+ and 26 trout aged 1+ & older.

4.1 Trout Fry/5-Min

The primary result of the surveys is expressed as **fry/5-min**, which is the number of individual brown trout fry aged 0+ caught in 5 minutes of electrofishing^{iv}. The number of sites sampled during the annual surveys increased from 8 in 2023 to 15 in 2024 (Table 4.1), and the catchment-wide average fry count was very similar each year. Boxplots of the annual fry counts illustrate how the range of values at sites varies across years, with the median value similar between 2023 and 2024; counts of between 3 to 11 fry/5-min were recorded at half of sites overall (Figure 4.1).

	-	-	-		
Year	Sites	Trout 0+ fry:	Trout 0+ fry:	Trout 0+ fry:	Trout 0+ fry:
surveyed	sampled	total	site minimum	site maximum	mean per site
2023	8	75	0	39	9.4
2024	15	145	2	23	9.7

Table 4.1: Summary of trout 0+ fry/5-min counts from the Clodiagh River catchment, 2023–2024.



Survey year

Figure 4.1: Boxplot of trout fry/5-min counts from Clodiagh River surveys, 2023–2024: thick horizontal line is the median; top and bottom of the box representing the interguartile range (IQR) are the 75th and 25th percentiles; vertical 'whiskers' are 1.5×IQR; orange points are fry counts per survey with random jitter added to aid visibility.

[&]quot; Fish that were missed and identified as "salmonid" during electrofishing were assigned as brown trout or salmon depending on the proportion of captured and measured fish in the survey.

^{iv} For fish other than 0+ fry, the unit is **trout/5-min** for 1+ & older brown trout and **fish/5-min** for other species.

With only two years surveyed so far, there is a limited amount of data for determining trends in count numbers across the Clodiagh River catchment (Table 4.2; Figure 4.2). For rivers and streams where data are available for both years, an increase in mean trout 0+ fry/5-min numbers in sites was recorded for the Clodiagh, the Fishmoyne, the Farneybridge, the Aughboy and the Owenbeg tributary. In contrast, the mean trout 0+ fry/5-min count decreased slightly for the Glashagloragh and decreased sharply for the Cromoge.

The spatial patterns of trout 0+ fry/5-min and 1+ & older trout/5-min counts in surveys across the catchment over the period 2023–2024 are shown in Map 4.1.

Pivor	Sites		Mean 0+ fry/5-min		All years	
nivei -	2023	2024	2023	2024	Mean	SD ^v
Clodiagh	1	3	11	17.3	15.8	8.0
Cromoge	1	1	39	10.0	24.5	20.5
Fishmoyne	1	3	4	6.7	6.0	5.4
Farneybridge	2	3	3	5.7	4.6	3.0
Marlow	0	1	-	2.0	2.0	-
Aughboy	1	1	0	15.0	7.5	10.6
Owenbeg	0	1	-	3.0	3.0	-
Owenbeg tributary	1	1	8	20.0	14.0	8.5
Glashagloragh	1	1	7	6.0	6.5	0.7

Table 4.2: Mean brown trout 0+ fry/5-min counts across rivers in the Clodiagh River catchment, 2023–2024.



Figure 4.2: Changes in mean trout fry/5-min counts among the Clodiagh River and tributaries, 2023–2024.

^v SD = standard deviation.



Map 4.1: Spatial distribution of counts of trout 0+ fry/5-min and 1+ & older trout/5-min at survey sites across the Clodiagh River catchment, 2023–2024. Map key: Clodiagh (CL), Cromoge (CR), Fishmoyne (FM), Farneybridge (FB), Marlow (MW), Aughboy (AY), Owenbeg (OW), Owenbeg tributary (OT), Glashagloragh (GL).

4.2 Trout Length Frequency

Fish were measured in length classes: for example, fish measuring \geq 5.0 cm and <6.0 cm are in the 5 cm length class. All brown trout and salmon captured or observed and counted for each five-minute fishing were assigned one of two age classes based on length frequency distribution:

- 0+ are juvenile fry aged less than one year old, which were born the previous winter.
- 1+ & older (1++) fish are aged at least one year old; these fish may be juvenile fish aged 1+ after one year's growth, or they may be older adult fish.

Overall, the length of 209 brown trout were measured in 2023–2024, comprising 184 0+ fry and 25 1+ & older trout. The median length of trout 0+ fry was higher in 2023 compared with 2024, with a median length of 7 cm overall (Figure 4.3).



Figure 4.3: Boxplot of trout length classes from Clodiagh River surveys, 2023–2024. Each point represents an individual 0+ fry (orange) or 1+ & older trout (violet); random jitter added to aid visibility.

The lengths of trout fry aged 0+ spanned the 5–9 cm length classes, whereas the lengths of trout aged 1+ and older spanned the 11–19 cm length classes (Figure 4.3). Individual fish were assigned to the 0+ or 1++ age classes based on their length with reference to the length frequency distribution for the river each survey year (Figure 4.4). As would be expected in juvenile nursery habitat, the trout recorded in the streams were generally quite small, the largest trout captured were in the 19 cm length class and were recorded in the Fishmoyne in 2023 and in the Clodiagh and Owenbeg in 2024 (Table 4.3).

Table 4.3: Summary of length class (cm) data for brown trout in the Clodiagh River catchment, 2023–2024.						
River	Median	Mean	SD	Minimum length	Maximum length	
Clodiagh	7	7.62	2.74	5	19	
Cromoge	6	6.24	1.28	5	12	
Fishmoyne	7	9.79	4.61	5	19	
Farneybridge	7	8.39	3.20	5	15	
Marlow	7	7.00	1.41	6	8	
Aughboy	6	5.93	0.88	5	8	
Owenbeg	8	11.00	5.39	6	19	
Owenbeg tributary	7.5	7.64	0.85	6	9	
Glashagloragh	6	6.92	2.14	5	13	



Figure 4.4: Length frequency of brown trout captured in the Clodiagh River catchment, 2023–2024; orange bars are trout 0+ fry; violet bars are trout aged 1+ & older; vertical black dashed line is the median value for trout length class (cm) for the stream each year.

4.3 Fish Community

The fish community of the Clodiagh River catchment was dominated by brown trout. The other species recorded comprised, in order of decreasing abundance, Atlantic salmon, three-spined stickleback, stone loach, European eel and juvenile lamprey (Table 4.4). The Aughboy was the river with the greatest species richness, with 6 species, whereas the Marlow, the Owenbeg and the Owenbeg tributary were the least diverse, with just 3 species present (Map 4.2).

Table 4.4: Summary of fish species counts across years from the Clodiagh River catchment, 2023–2024

Species	2023	2024	Total
Brown trout	70	153	223
European eel	2	6	8
Lamprey	0	4	4
Atlantic salmon	54	47	101
Stone loach	21	32	53
Three-spined stickleback	1	55	56



Map 4.2: Distribution of fish species recorded in the Clodiagh River catchment, 2023–2024. Map key: Clodiagh (CL), Cromoge (CR), Fishmoyne (FM), Farneybridge (FB), Marlow (MW), Aughboy (AY), Owenbeg (OW), Owenbeg tributary (OT), Glashagloragh (GL).

5. Summary

The results for fry index counts indicate that the Cromoge (24.5 fry/5-min \pm 20.5 SD), the Clodiagh (15.8 fry/5-min \pm 8 SD) and the Owenbeg tributary (14 fry/5-min \pm 8.5 SD) generally had relatively higher numbers of trout compared with other streams across the catchment. The length frequency distribution showed that these rivers also tended to have with a relatively high proportion of trout fry aged 0+ but that at least some older trout were also present each year.

The Fishmoyne (6 fry/5-min \pm 5.4 SD) and the Farneybridge (4.6 fry/5-min \pm 3 SD) had relatively low fry index counts, with relatively higher proportions of 1+ & older trout each year compared with other streams across the catchment. It must be noted, however, that survey sites were selected to target habitat likely to provide spawning and to shelter fry. Therefore, the results are expected to show some variation in the counts for 1+ & older trout.

Overall, the length frequency distributions of streams in the Clodiagh River catchment were not observed to change greatly over the survey period from 2023 to 2024, with each stream maintaining broadly similar proportions of 0+ fry and of 1+ & older trout from year to year. Although two years' data are not sufficient to draw strong conclusions, this may indicate that the trout populations in the catchment are stable and probably at a healthy level for the habitat available.

Excess sediment and algae were observed at several sites, particularly during 2024, which may indicate that water quality may be an issue in this catchment. Another issue occasionally observed was that many stretches of the Clodiagh River and its tributaries, Lough Ennell's tributary streams are not fenced from surrounding pasture, which means that livestock have access to the streams and may have an impact on water quality, erosion and excess sediment on gravels.

The NBTP aims to continue surveying the River Clodiagh catchment, together with the Lough Carra catchment and the Lough Ennell catchment, annually over the next few years until sufficient data are available for modelling. The fry index data will enable modelling of juvenile habitat availability and expected fry densities in catchment streams, which will be very informative for assessing the potential for river restoration and the enhancement of trout fry recruitment to adult fisheries.

The Brown Trout Juvenile Index Monitoring data will be important for the development of IFI's management strategy evaluation (MSE) for inland fisheries, which integrates scientific information on the biology of target fish species and ecological interactions within fish communities with real world data on catch statistics to estimate the status of fishery stocks. Ultimately, applying this framework for assessing management options to inland fisheries will help IFI to develop best practice and to use informed decision-making for the conservation of brown trout fisheries.

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7. Appendixes: Site Photos



Figure 7.1: Clodiagh: Annfield Bridge (see Map 2.2, site 1).



Figure 7.2: Clodiagh: Rathcardan Bridge (see Map 2.2, site 2).



Figure 7.3: Clodiagh: Gorteennabarna Bridge (see Map 2.2, site 3).



Figure 7.4: Cromoge: Ballyroan Bridge (see Map 2.2, site 4).



Figure 7.5: Fishmoyne: Rathmoy Bridge (see Map 2.2, site 5).



Figure 7.6: Fishmoyne: Fishmoyne Bridge (see Map 2.2, site 6).



Figure 7.7: Fishmoyne: bridge in Brookley (see Map 2.2, site 7).



Figure 7.8: Farneybridge: d/s Farney Bridge (see Map 2.2, site 8).



Figure 7.9: Farneybridge: Ballynahow Bridge (see Map 2.2, site 9).



Figure 7.10: Farneybridge: d/s bridge on R498 (see Map 2.2, site 10).



Figure 7.11: Marlow: Marlow Bridge (see Map 2.2, site 11).



Figure 7.12: Aughboy: d/s road bridge (see Map 2.2, site 12).



Figure 7.13: Owenbeg: 100 m u/s Ballyoughter Bridge (see Map 2.2, site 13).



Figure 7.14: Owenbeg tributary: Pendye's crossroads (see Map 2.2, site 14).



Figure 7.15: Glashagloragh: d/s landbridge (see Map 2.2, site 15).

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