Report on Salmon Monitoring Programmes June 2015- June 2016 funded under the Salmon Conservation Fund

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Salmon Monitoring: Report on projects to assess attainment of Conservation Limit for Atlantic Salmon in Irish Rivers

Project Personnel

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Acknowledgements

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Executive Summary

- Funding was provided under the Salmon Conservation Fund to assess the status of salmon in selected catchments. There were three separate elements in the 2015/2016 programme - **Catchment-Wide Electro-Fishing (CWEF), estimation of salmon smolt to adult return survival rates and determination of the life history characteristics of adult salmon in selected catchments.**

- CWEF consists of broad-scale electrofishing at disparate riffled sites in a given catchment. Timed electrofishing (5 min duration) is undertaken at each site and an average catchment value (no. 0+ salmon fry/5min -all sites) is calculated. The immediate objective of the catchment-wide electro-fishing (CWEF) programme is to determine if mean salmon fry abundance exceeds a catchment threshold value of 17 salmon fry/5-min (computed by SSCS from annual CWEF results). This is deemed a qualifying value for managers to allow rivers to open for angling on a catch and release basis for systems where information on adult returns is otherwise not available or limited. Analysis has shown that the majority of rivers known to be meeting and exceeding their Conservation Limit have a salmon fry index of 17 or higher.

- CWEF was completed in 35 catchments around Ireland in 2015 (July – September) to assess distribution and abundance of salmon fry. A total of 522 sites were visited. Catchment-wide abundance ranged from an average of zero fry/5min on the Kealincha, Culoort and Lough Na Furnace, to a maximum catchment average of 28.52 salmon fry on the Erriff, a productive salmon system, IFI's National Salmonid Index System. The Flurry and the Glen recorded catchment wide averages >17 fry. Salmon fry abundance exceeding > 15 was recorded on the Leannan catchment. A large proportion of the catchments surveyed were small which historically produced low numbers of salmon. The Erriff and Leannan are index catchments which are sampled annually.

- Rivers where the CWEF threshold value was ≥ 17 over the 2007-2015 period, (within the most recent five year period where several annual survey data are available), were already open for angling as catch and release fisheries, which was consistent with their predicted under-surplus status. In general there was good agreement between the SSCS scientific assessment of attainment of salmon conservation limit from rod catch or counter data (from index or well monitored catchments) and the results of the catchment-wide electro-fishing surveys.

- The long-term objective of the CWEF programme is develop an index of juvenile salmon abundance (0+ salmon fry) to support assessment of attainment of a salmon conservation limit (CL) on an individual river. Fry abundance is assumed to be an appropriate proxy for adult salmon abundance in the previous spawning period. Results to date suggest that the CWEF technique has good potential for initial or ongoing salmon stock assessment. Where sufficient data can be accumulated in catchments with an independent adult stock monitoring system it is intended to analyse the potential of building fry and adult return relationship models. The technique and associated models are likely to provide the best estimate of salmon stock status in closed rivers and in small rivers where rod catch was historically low (<10 salmon annual rod catch).

- CWEF is important in providing managers with detailed information on salmon fry distribution and abundance. The absence or low density of salmon fry may be related to water quality issues, obstructions, or habitat damage and areas of low abundance can be investigated. These data can be used to target any remediation works that may be required. A partial survey of the Fane Catchment following the breaching of the Art Hamill Weir at Cullaville has not found evidence of salmon spawning above the weir.

- Qualitative distribution data for all other fish species and some other aquatic biota recorded during CWEF sampling is mapped at catchment level.

- The salmon smolt to adult return rate is one of the key performance statistics to understand the survival of salmon populations in the marine phase. This statistic is widely used and for all scientific assessments of salmon (e.g. ICES, NASCO etc) for management. Almost 1000 wild salmon smolts were PIT tagged during the smolt run in the Erriff (National Salmonid Index Catchment) in Spring 2016. The PIT detection antenna and reader unit installed and tested in the Erriff upstream trap in early 2016 will monitor all returning adults for PIT tags in 2017 and enable direct determination of a smolt to adult survival rate.

- Salmon scales were collected and analysed for life history information from rod fisheries on the Corrib and Bandon River. The Corrib recorded 84% grilse and 15% multi sea winter (MSW). The River Bandon recorded 75% grilse and 25% MSW.

1. Assessment of Attainment of Conservation Limits for Atlantic Salmon in Irish rivers in 2015: Report on Activities

1.1. Introduction

In spring 2009, scientists from the Standing Scientific Committee of the National Salmon Commission identified appropriate methods for assessment of attainment of salmon conservation limits (CL) on an individual river basis nationally. They also proposed a strategy for prioritisation of rivers for assessment of attainment of Conservation Limits. This assessment was based on the feasibility of inserting new counters, undertaking redd counts, use of electro-fishing as an index of spawning, obtaining full counts from partial counters by tagging etc. on catchments and was linked to the current status of salmon stocks in each river (Anon 2009). Other data such as salmon rod catch, commercial catch by river, micro-tagging data, marine survival and fishery exploitation data are used annually by the Standing Scientific Committee to assess salmon stock status.

A successful application was made by Inland Fisheries Ireland to the Salmon Conservation Fund (SCF) for funding for 2015/2016 to assess attainment of salmon conservation limits nationally. This report presents the results of activities undertaken in 2015 to assess attainment of salmon conservation limits nationally consistent with some of the assessment methods identified by SSCS scientists. The project had three elements and activity was conducted between June 2015 and June 2016:

1. Catchment wide Electro-Fishing Programme

The programme entailed undertaking catchment-wide electro-fishing in selected catchments to assess abundance and distribution of salmon fry and to further develop an index of juvenile salmon abundance which can be used to assess attainment of salmon conservation limit. Resources and training in the catchment wide electro-fishing technique were also provided to IFI staff nationally.

2. Use of telemetry (PIT tagging) to develop salmon stock assessment metrics

a. Estimate salmon smolt to adult return survival rates

The salmon smolt to adult return rate is widely used for many scientific assessments of salmon (e.g. ICES, NASCO etc) for management. Reduced survival in this phase is the major pointer to reduced population size and understanding the reason for these losses is driving several marine phase research programmes. In order to enhance these data for wild salmon in Irish rivers a PIT tag recording system was installed in the River Erriff (national index catchment) to provide a direct count of the numbers of returning tagged adult fish. Up to 2000 adult salmon run the system annually and its research facilities include a full upstream trap/counter at the head of the tide which allows for full counts of upstream migrating fish. Up to 1000 wild smolts per annum will be PIT tagged per annum (depending on smolt output) and the proportion of returning tagged fish will provide a direct estimate of survival. It is envisaged that this installation will subsequently be supported by a medium-term tagging programme (at least 5 years) to build up a meaningful dataset.

b. Efficiency of a partial counter

Because of the efficiency of PIT tags, their relatively low cost and their small size (which allows fish as small as salmon smolts to be tagged) this technology has been used to investigate the efficacy of partial counters in Irish waters. Such a study was proposed for the partial counter on the River Dee in 2015 where adult salmon would be captured and tagged *in-situ* and released. Capturing sufficient numbers of adult salmon for tagging immediately prior to high water periods, when the hypothesis that substantial numbers could ascend the weir and bypass the counter, could be tested, proved insurmountable and the project was not pursued in 2015.

3. Biological Assessment of Salmon Populations

Knowledge of salmon life history strategies is required to understand and model salmon populations in different systems. Biological data on salmon including sea age, run-timing, sex ratio and fecundity are necessary to understand population dynamics within a river. Changes to any of these inputs can influence the outcome of the production models used to predict the likely returns to a river and potential fishery performance. Life history traits such as smolt age, sea age, growth and frequency of spawning can be determined from scale reading. Combined with data on time of entry into the system, sex ratio and fecundity, which can be collected from any killed fish, the often complex make up of a population can be established and the models can be adjusted accordingly. Scales were collected from a range of commercial and rod fisheries in 2015.

2. Catchment-Wide Electrofishing Programme 2015

2.1.1. Sampling Methodology

The sampling methodology followed that described in Gargan, P., Roche, W., Keane, S. & Stafford, T. 2009.

2.2. Results 2015

During 2015 a total of 35 salmon catchments were surveyed nationally; 522 sites were visited, 4320 salmon fry were sampled. Detailed individual catchment summaries with current and historical CWEF salmon fry distribution and abundance at site level is presented in Appendix A. Distribution data for other fish species at catchment level is presented in Appendix B.

The CWEF results for salmon fry for 2015 are summarised in Figure 2.1, Map 2.1 and Table 2.1. Abundance ranged from a catchment average of zero fry/5min on 5 rivers: the Kealincha, Lough Na Furnace, Culoort, Straid and Mill (Letterkenny) to a catchment average of 28.52/5 min on the Erriff. The Flurry and the Glen recorded an annual catchment wide average of >17 fry (Fig. 2.1). A value of 15 sal fry/5 min was recorded on the Leannan catchment. A high proportion of the catchments surveyed in 2015 were small catchments which historically produced low numbers of adult salmon and several were sampled to report their salmon biodiversity status.

Table 2.1 also summarises all CWEF data (2007-2015) for catchments surveyed in 2015. Four catchments surveyed in 2015 had a mean annualised catchment wide salmon fry index (all years) of ≥ 17 fry: these were the Erriff, the Eany, the Glen and the Leannan (Table 2.1). All are open to angling (harvest fishery or catch & release).

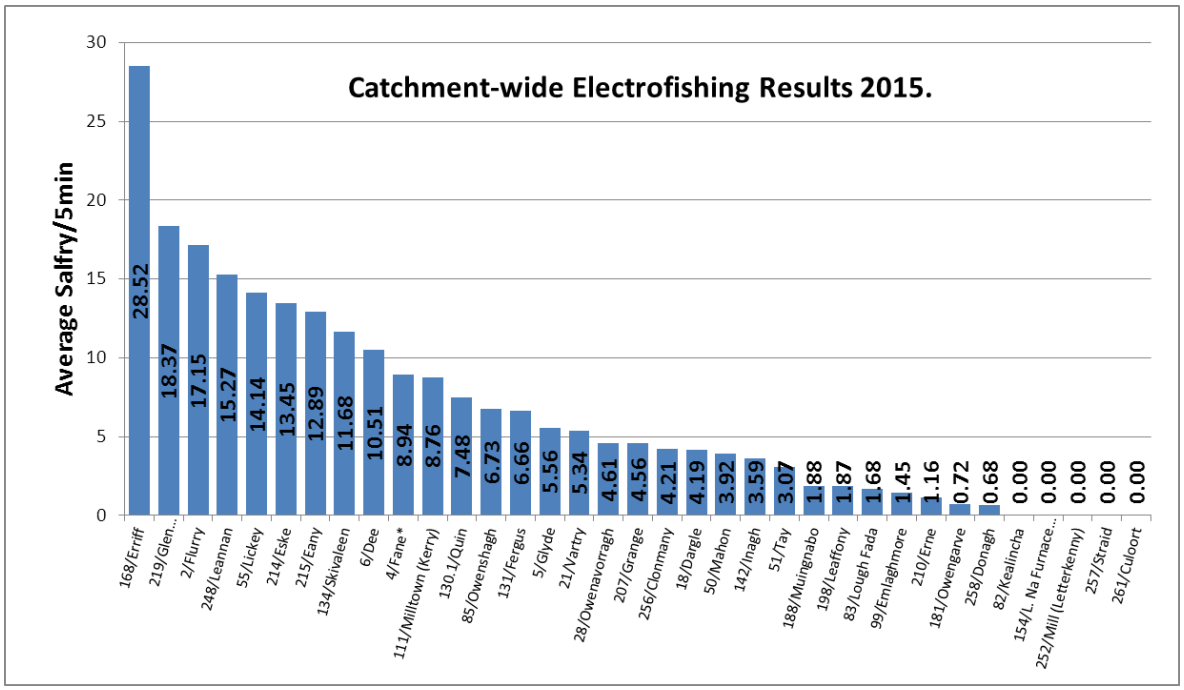
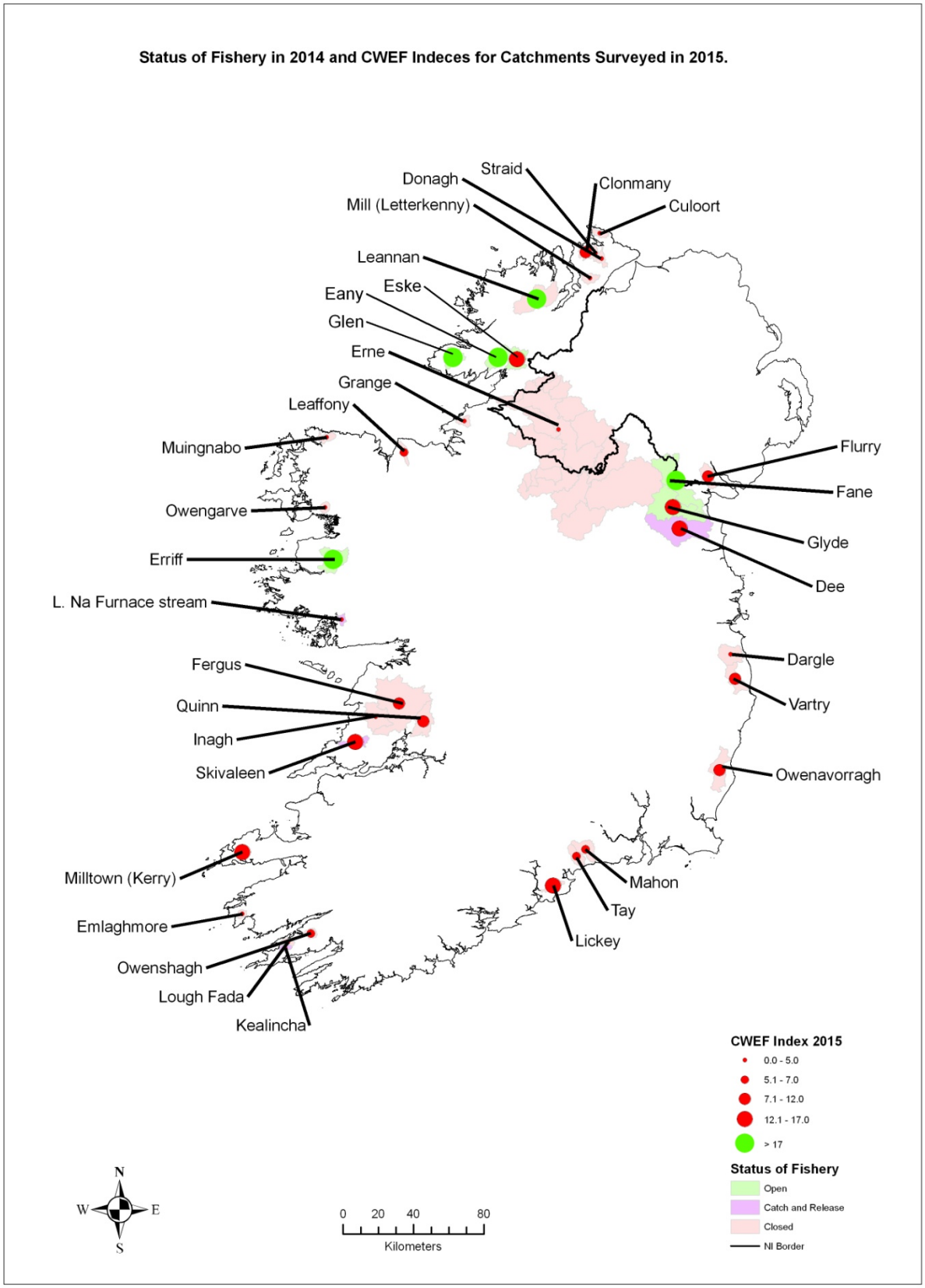


Figure 2.1: Summary of CWEF results (for 2015) for catchments surveyed in 2015 (*Fane partial survey)

IFI Code/ River	Survey Year									Current Index	# of Annual Surveys Considered
	2007	2008	2009	2010	2011	2012	2013	2014	2015		
002/Flurry				5.24					17.15	11.19	2
004/Fane			16.17			22.09			8.94*	19.13	2
005/Glyde		2.49	17.08	31.61					5.56	14.18	4
006/Dee		8.55	16.92	21.72	20.13				10.51	15.56	5
018/Dargle			1.40	2.53	7.52				4.19	3.91	4
021/Vartry		10.00	15.11	2.54	15.07				5.34	9.61	5
028/Owenavorragh				19.76			0.33		4.61	8.23	3
050/Mahon		2.11						10.72	3.92	5.58	3
051/Tay					8.75				3.07	5.91	2
055/Lickey		12.37							14.14	13.26	2
082/Kealincha	0.00								0.00	0.00	2
083/Lough Fada	3.23								1.68	2.45	2
085/Owenshagh							4.32		6.73	5.53	2
099/Emlaghmore	2.07								1.45	1.76	2
111/Milltown (Kerry)		15.33		26.44			13.02		8.76	15.89	4
130.1/Quin									7.48	7.48	1
131/Fergus	12.96		4.10	6.84			5.89		6.66	7.29	5
134/Skivaleen					14.82				11.68	13.25	2
142/Inagh								5.31	3.59	4.45	2
154/L. Na Furnace stream									0.00	0.00	1
168/Erriff	29.51	24.10	16.03	20.43	20.86	24.45	27.45	24.90	28.52	25.24	5
181/Owengarve			5.51					6.19	0.72	4.14	3
188/Muingnabo	0.78								1.88	1.33	2
198/Leaffony	5.76		7.95						1.73	5.15	3
207/Grange	5.75		3.29						4.56	4.53	3
210/Erne		7.37	0.17	0.08	0.00	0.00	0.00	1.60	1.16	0.55	5
214/Eske		13.10	16.99	16.30					13.45	14.96	4
215/Eany				15.86		30.08			12.89	19.61	3
219/Glen (Ballyshannon)				19.44					18.37	18.91	2
248/Leannan	9.47	7.41	8.73	16.71	12.36	21.51	19.51	20.87	15.27	17.90	5
252/Mill (Letterkenny)				0.00					0.00	0.00	2
256/Clonmany		16.61		6.59					4.21	9.14	3
257/Straid				0.20					0.00	0.10	2
258/Donagh				4.25					0.68	2.46	2
261/Culoort				4.03					0.00	2.02	2

Table 2.1: Summary of CWEF values for catchments electrofished during 2015. (*partial survey on Fane)



Map 2.1: Catchment-wide electrofishing summary results for catchments surveyed in 2015 along with their salmon angling status during the 2014 angling season.

2.3. CWEF Results 2007 – 2015

Summary of CWEF survey effort 2007-2015

From 2007 to 2015 a total of 136 separate catchments or sub-catchments have been sampled. Repeat surveys have been carried out in multiple catchments to monitor fry levels for management and to fulfil other obligations (e.g. Article 17 reporting under the EU Habitats Directive). Over this period a total of 348 catchment surveys amounting to 7317 individual site surveys have been conducted nationally. To facilitate assessment of status based on fry abundance mean annual abundance values for the most recent five year period where data are available is calculated. This approach is consistent with the SSCS approach to other datasets and reduces the potential of one extreme result influencing the data disproportionately. Annualised CWEF results 2007 to 2015 for all catchment surveyed are presented in Appendix C.

Trends in Salmon Fry Abundance over Time

Data in Figures 2.2 and 2.3 present the CWEF annual mean abundance of salmon fry in 94 catchments at catchment level where more than one year of electro-fishing results are available. Figure 2.4 shows the average salmon index for all years combined for each catchment surveyed to date. Forty two catchments have only one survey within the period used to calculate the CWEF index. These data are mapped in Map 2.2. Generally, rivers fished along the east and south east coast recorded low salmon fry numbers. Low fry numbers were also recorded for rivers in the north-west and Donegal Bay. Many of the smaller catchments along the west coast had low numbers of fry. Highest salmon fry numbers were recorded in rivers in Kerry and Connemara.

In terms of individual CWEF values by year consistently high mean salmon fry abundance was recorded over the period on the Glyde, Dee, Boyne, Liffey Lower, Slaney, Blackwater (Kerry), Maine, Owenascaul, Carrownisky, Erriff, Carrownisky, Garvogue, Duff, Bungosteen, Lackagh and Leannan systems (Figures 2.2 and 2.3). Decreases have been observed in recent years on the Liffey lower, Finnihy, Emlagh, Milltown (Kerry), Feohanagh, Ballinglen, Glenna and Glennagannon rivers. The majority of these are smaller systems where small fluctuations in the number of returning adults might reasonably be expected to influence fry abundances. Increases were observed on the Fane, Liffey Upper, Dargle, Barrow, Owenwee (Yellow) and Erriff rivers in recent years. A more detailed assessment of trends in salmon fry abundance by Fishery Region and by individual catchment is provided in Appendix A.

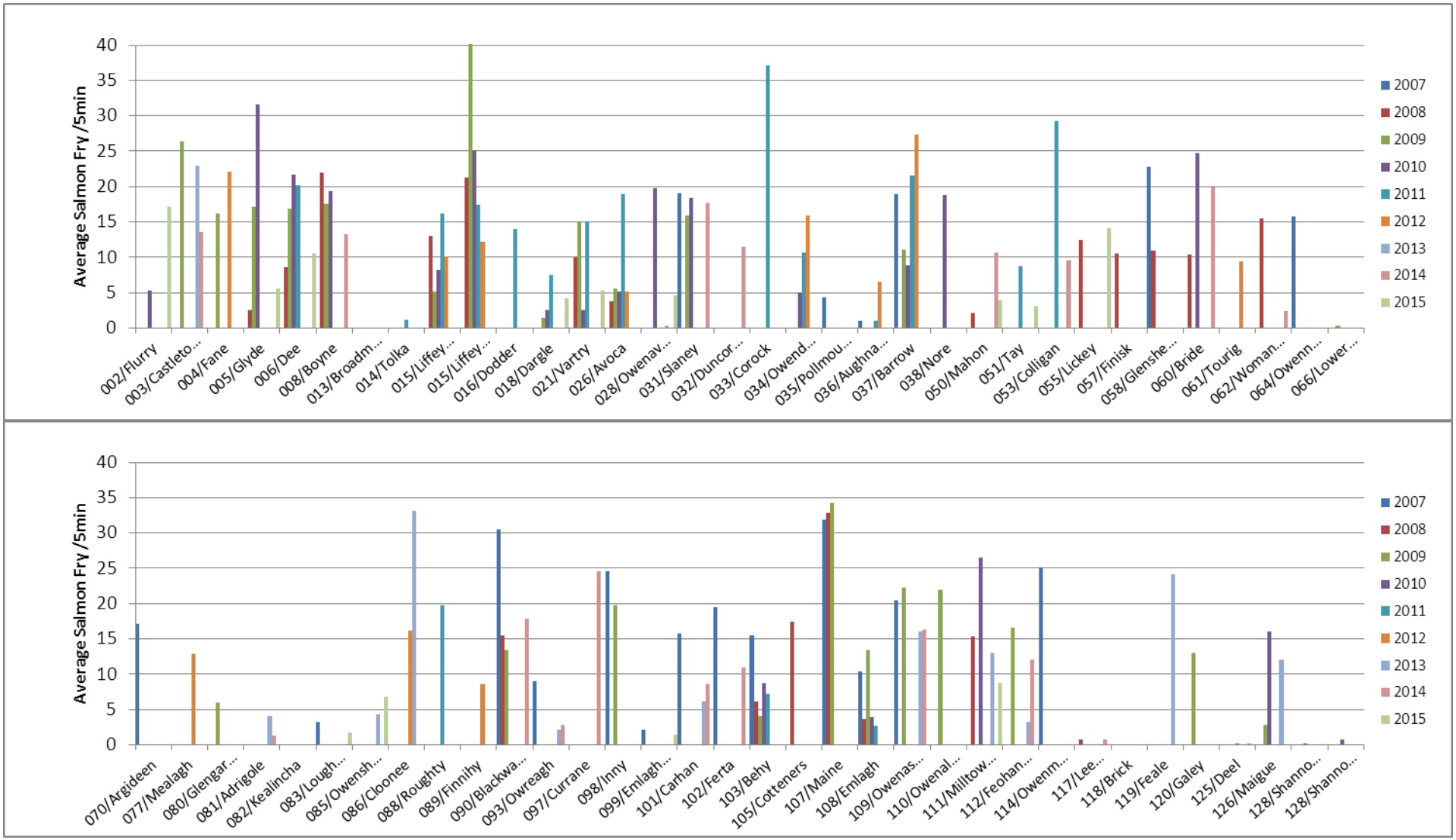


Fig 2.2: Annual Catchment-Wide Electrofishing results 2007-2015.

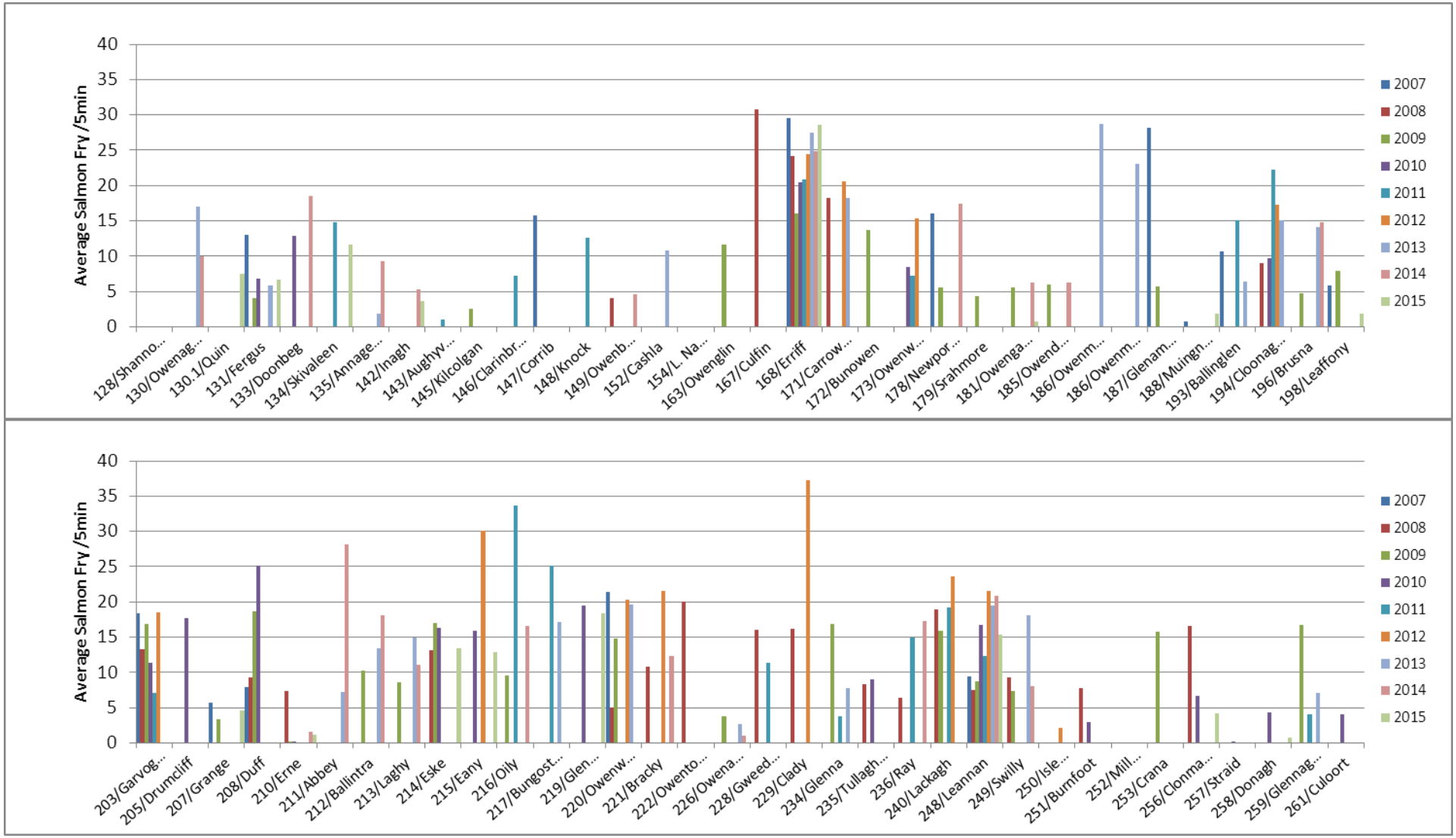


Fig 2.3: Annual Catchment-Wide Electrofishing results 2007-2015.

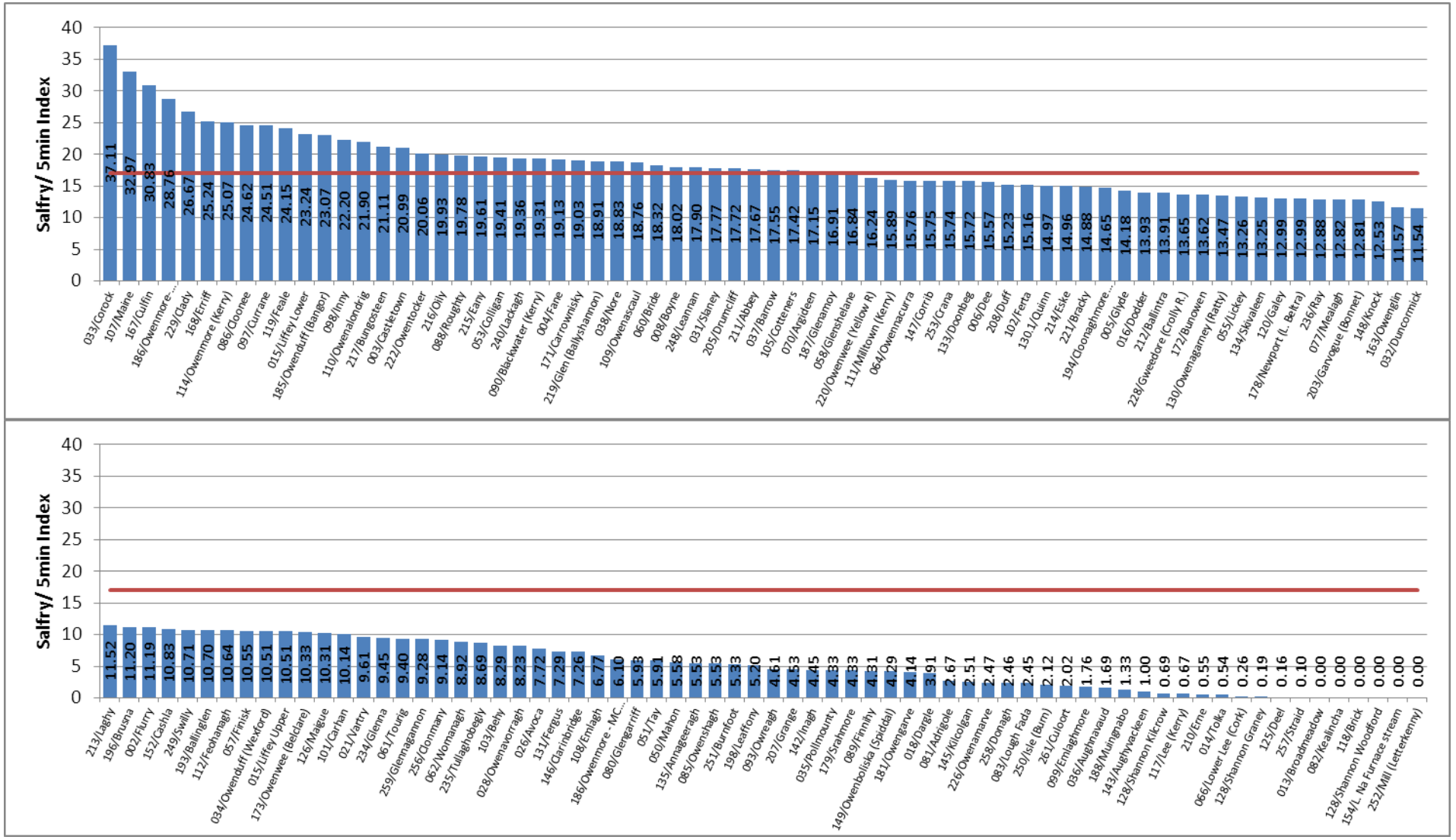
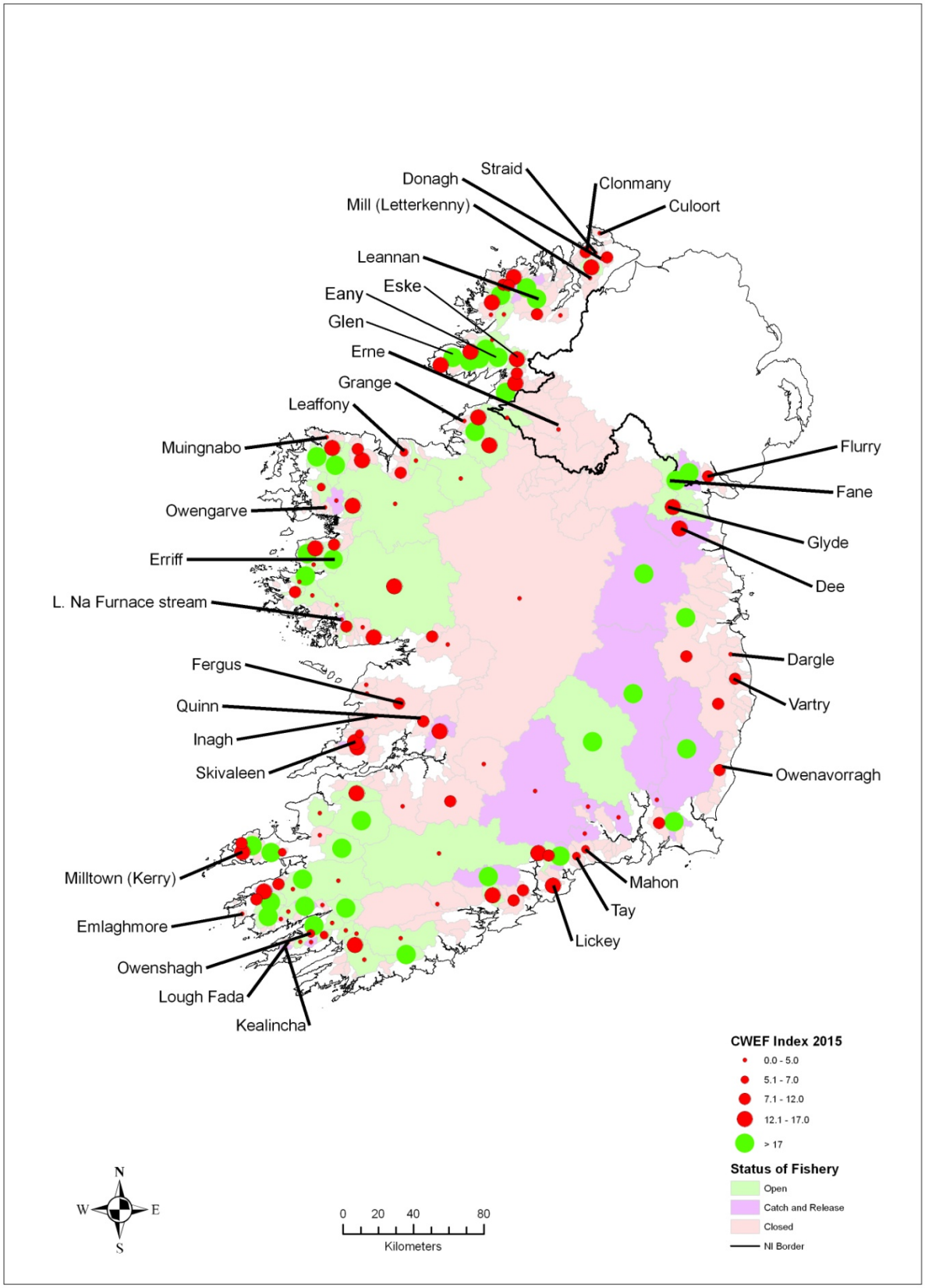


Figure 2.4: Current CWEF index (mean salmon fry per 5 minutes) for all catchments surveyed to date.



Map 2.2: Mean Salmon Fry index for all catchments (all years sampled) including 2015 data, compared to 2014 salmon angling fishery status (open, catch & release or closed)

3. Use of telemetry (PIT tagging) to develop salmon stock assessment metrics

Telemetry is a technology that can be used to track fish in the aquatic environment. Many different options exist to tag fish which is dependent on the species management requirements and the habitat type the species occurs in. For salmon, where the marine phase is often the focus of research and management studies given that considerable losses occur at sea resulting in smolt to adult survival rates in recent decades being recorded as single digit percentages. The salmon smolt to adult return rate is widely used for many scientific assessments of salmon (e.g. ICES, NASCO etc) for management. Reduced survival in this phase is the major pointer to reduced population size and understanding the reason for these losses is driving several marine phase research programmes. Existing programmes (coded wire tagging) generate data for wild and reared smolt survival from systems like Burrishoole and Corrib. These survival figures rely on retrieving tags from rod caught or a limited number of commercially caught fish in these systems and also recovery of tags from any broodstock captured in traps. Given that adult returns are low reliance on retrieving tags from returning fish, where capture rates are also low (10-20% of the population for rod caught fish), may compromise data quality particularly in years where rod catch is low.

Salmon typically spend one to two years at sea – tags which require a battery to power its function tend to be large due to the battery life required to operate such tag for this length of time. PIT tags, which are miniature encased microchips, offer an ideal solution to the technological limitation imposed by large battery size in other electronic tags. Providing a lifetime barcode for the tagged animal a PIT tag can be easily inserted into the body cavity of a small fish (or mounted in an external floy tag to affix to a larger fish).

A PIT tag (Passive Integrated Transponder tag) is a uniquely coded microchip (typically about 10mm in length and 2 mm in diameter). This tag type is available in different sizes and can be used to tag fish of all sizes. For fish studies a PIT tag scanner (antenna) is permanently positioned in or close to a chokepoint in a river system (often a fish counter location) and the scanner will read the tag code of any tagged fish passing within its range. A decoder linked to the antenna stores the tag number and the date and time of this event.

In order to enhance smolt to adult survival data for wild salmon in Irish rivers a PIT tag recording system was installed in the River Erriff (national index catchment) to provide a direct count of the numbers of returning tagged adult fish. Up to 2000 adult salmon run the system annually and its research facilities include a full upstream trap/counter at the head of the tide which allows for full counts of upstream migrating fish.

In its simplest application, by determining the number of pit-tagged adult salmon passing upstream through the counter relative to the total number of smolt pit tagged initially, a smolt to adult survival index can be calculated. The basis for these types of studies is a variation of a mark-recapture application. IFI has developed a salmon smolt tagging programme based on this principle and funding from the SCF was used to install the infrastructure. One PIT tagging project was initiated in 2015/2016 and as the majority of surviving adults will return as 1 SW salmon (grilse) a time lag of one year from tagging of smolts will apply. Results will advance understanding of salmon life history and complement ongoing short-term research work in the system based on acoustic tagging of outgoing salmon smolts.

Ultimately these data will contribute to refining adult salmon modelling at the SSCS because it is based on wild salmon which are returning to a research station with high quality trapping and monitoring instrumentation. Further understanding of potential pressures/threats/losses from various factors (e.g. sea lice emanating from an aquaculture facility in Killary Harbour, predators etc) will be further elucidated from this work. It is envisaged that this study will necessitate a medium-term tagging programme (at least 5 years) to build up a meaningful dataset.

3.1. Erriff River PIT tag unit installation

A Biomark customised thin-walled shielded antenna, designed to bolt on to the existing VAKI Riverwatcher counter fitted in the Erriff upstream trap, was fitted in February 2016 (Fig 3.1). Considerable testing and tuning was required to maximise antenna reading function without interfering with the VAKI counter function. The technical issues were resolved in mid-2016.

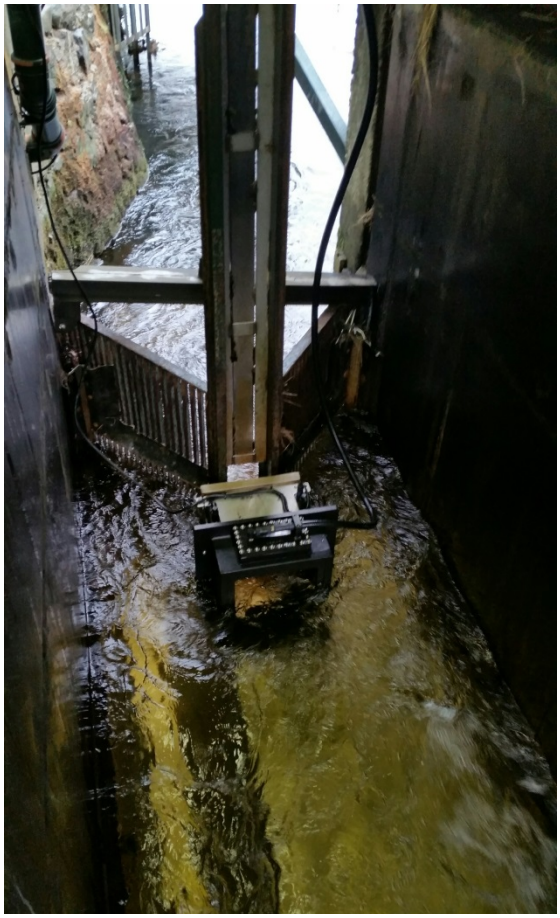
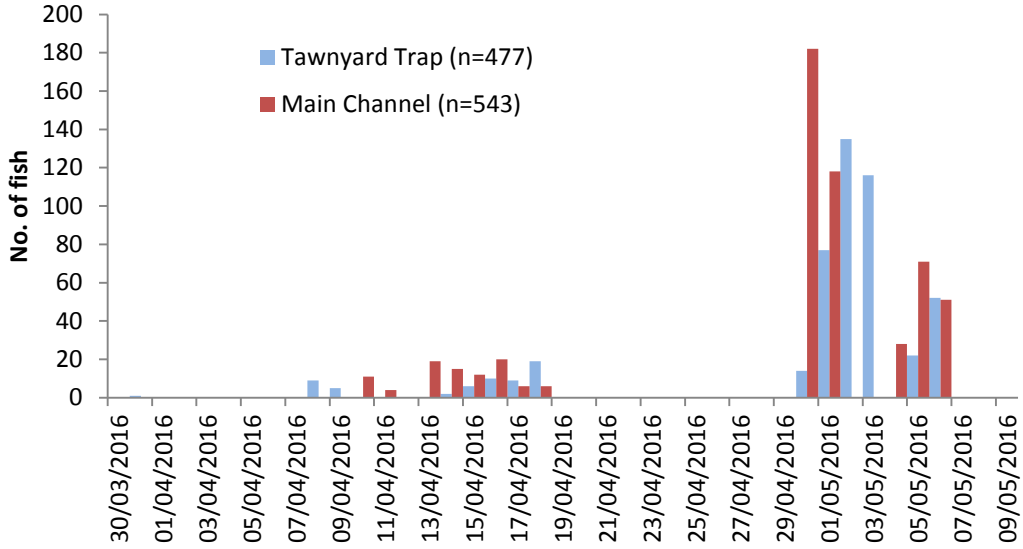


Fig 3.1. Erriff upstream trap inscale with VAKI Riverwatcher counter and Biomark antenna (dark rectangular unit).

A total of 1020 wild salmon smolts were captured and PIT tagged (Biomark APT 12 Pre-Loaded) in Spring 2016 on the River Erriff. Smolt sampling commenced in late March and concluded in early May. Sampling was conducted at two sites: Tawnyard trap, a fixed trap located on the Black River, a tributary of the main Erriff and on the upper main channel using a screw trap.

A total of 1020 smolts were tagged (Fig. 3.2) and the majority were tagged over a few days in late April. Main river mean smolt length was 11.7 cm (SD 1.04) while smolts trapped in the Black river were larger - 13.5 cm (SD 1.39) (Table 3.1). The Black river drains Tawnyard Lake – the size difference may indicate that the lake may influence smolt size. Scale analysis will be undertaken to investigate this observed difference.

Figure 3.2 Salmon smolt PIT tagging Erriff catchment March - May 2016: timing and number tagged



			Length (cm)		
Sampling site	**Dates**	**n**	**Mean**	**Min**	**Max**
Black River (Tawnyard trap)	30/3 – 6/5/2016	477	13.46	10.1	18
Main channel Erriff (Erriff Br)	30/3 - 9/5/2016	543	11.7	8.7	15.2
	Total:	**1020**			

Table 3.1. Summary details for salmon smolt from the Erriff system PIT tagged in 2016.

4. Biological Assessment of Salmon Populations

Knowledge of salmon life history strategies is required to understand and model salmon populations in different systems. Biological data on salmon populations including sea age, run-timing, sex ratio and fecundity are necessary to understand population dynamics within a river. Changes to any of these inputs can influence the outcome of the production models used to predict the likely returns to a river and potential fishery performance. Life history traits such as smolt age, sea age, growth and frequency of spawning can be determined from scale readings. Combined with data on time of entry into the system, sex ratio and fecundity, which can only be collected from internally examined fish, the population structure can be established, and the models can be adjusted accordingly. For example, if the proportion of Multi-Sea-Winter (MSW) salmon entering a system is greater than previously known this would have the effect of reducing its river specific Conservation Limit as these fish are likely to have a higher female: male ratio and would transport a greater number of eggs into a catchment because of their greater size compared to grilse.

In order to enhance data quality for existing models and to improve the quality of the scientific advice, particularly for rivers where the stock structure may be complex or has changed, it is important to characterise stocks. Figure 4.1 shows the proportions of fish of different life histories changing throughout the year. Sex ratio and fecundity may change in response to the composition of the total population. These data are required for the on-going scientific assessment of salmon fisheries in which IFI is intimately involved through the machinations of the Standing Scientific Committee.

4.1. Salmon Life History

Salmon scales have been collected by commercial fishermen and fisheries officers from several commercial draft net fisheries and by anglers in rod fisheries, since 2010. Biological data, date and location of capture are recorded and this process has resulted in a substantial scale collection being assembled. From 2005 to 2015 a total of 7658 sets of salmon scales have been collected from 17 different fisheries (Table 4.1). Almost 48% of the total was from the commercial fishery on the River Nore. The Corrib angling fishery contributed almost 14% while the Castlemaine commercial fishery accounted for 13.4%.

The majority (93%) of scale samples were sampled between week 23 and week 36 reflecting the periodicity of the commercial fishery and the angling fishery (Fig 4.1). 1 sea winter salmon (grilse) dominate the sample and appear in the fishery from week 21 onwards. MSW are a constant in all sampling weeks although this component of the stock is more prevalent from week 20 to week 34.

Of the 1808 fish for which scales have been examined to date, 633 were Multi-sea winter fish (MSW), 1061 were grilse; 92 fish were previously spawned grilse (PSG), and the remaining 22 had scales from which age determination was not possible. Of these three fish types the MSW were on average the largest, with a mean weight of 5.07 kg, PSG had an average weight of 4.87kg and grilse an average weight of 2.61kg. Most of the grilse were below 4kg and most MSW and PSG were 4kg or above. The sizes and proportions of fish types vary considerably between catchments (Fig 4.2).

Life history at individual catchment level is presented in Fig. 4.3. High proportions of grilse dominate most systems but MSW salmon exceed 50% of samples from the Suir, Nore, Lee (Cork Harbour), Ilen and Boyne. Dominance by grilse is typical of the majority of Irish salmon populations. The high representation by MSW in some catchments merits further analysis to eliminate the possibilities of sampling bias due to seasonal factors or reporting bias due to sampling methodologies.

Table 4.1: Summary of Scale collection from adult fish caught 2005 to 2015 at various locations throughout Ireland.

		Fisher Type			Length Weight Information						Dates Fish Captured	
River	Year	Angling	Commercial or Scientific	Illegal	None	Length & Weight	Length only	Weight Only	Aged/ Examined	Grand Total	From	To
Bandon	2015	51				46	1	4	51	51	10/05/2015	27/09/2015
Blackwater (Munster)	2011	13	54			52	11	4	67	67	13/07/2011	12/08/2011
Blackwater (Munster)	2012	1	133			103		31	132	134	28/05/2012	27/08/2012
Blackwater (Munster)	2013	6				1		5	6	6	02/05/2013	26/06/2013
Boyne	2013		186		2			184	101	186	18/06/2013	25/09/2013
Castlemaine Harbour†	2010		785			785			163	785	10/06/2010	28/08/2010
Castlemaine Harbour†	2013		238		54	32	6	146	28	238	03/05/2013	30/07/2013
Corrib	2012	1				1			1	1	09/03/2012	09/03/2012
Corrib	2014	385				372	10	3	50	385	02/04/2014	22/08/2014
Corrib	2015	708				708			176	708	24/03/2015	31/07/2015
Erriff	2005		6			6			6	6	02/07/2005	08/07/2005
Erriff	2015	130				129		1		130	10/07/2001	25/09/2015
Feale	2006		15				15		15	15	00/01/1900	00/01/1900
Ilen	2013		13					13	13	13	14/05/2013	22/07/2013
Inny	2013		9		3	3		3	6	9	26/06/2013	02/07/2013
Laune	2013		18		18					18	07/06/2013	10/07/2013
Cork Harbour	2013		142		21	80	1	40	25	142	16/05/2013	01/08/2013
Nore	2009	2	42		2	16	22	4	44	44	03/08/2009	29/09/2009
Nore	2010	4	87		6	80		5	78	91	05/07/2010	30/09/2010
Nore	2011	1	1205		5	1182	8	11	143	1206	12/05/2011	12/08/2011
Nore	2012	2	357	2		351		10	76	361	10/05/2012	15/09/2012
Nore	2013	1	1471		9	1404	23	36	81	1472	14/05/2013	18/06/2014
Nore	2014		498			484	2	12		498	13/05/2014	14/08/2014
Owenmore - Ballinahinch	2006		18				18		17	18		
Owenmore - Ballinahinch	2007	12				11		1	12	12	16/07/2007	21/09/2007
Owenmore - Ballinahinch	2008	18				18			18	18	23/06/2008	19/09/2008
Owenmore - Ballinahinch	2009	13				13			13	13	13/07/2009	04/08/2009
Owenmore - Ballinahinch	2010	2				2			2	2	27/07/2010	23/08/2010
Owenmore - Ballinahinch	2011	9				8		1	9	9	09/05/2011	13/08/2011
Owenmore - MC	2006		6		6				6	6		
Sneem	2011	18				7		11	17	18	21/05/2011	17/09/2011
Suir	2010	8		2		9	1		8	10	12/08/2010	21/10/2010
Suir	2011	2	480		2	448	8	24	111	482	01/07/2011	09/09/2011
Suir	2012		9			9			9	9	19/07/2012	06/08/2012
Waterford Estuary†	2007	4		1			5		5	5	10/05/2007	09/08/2007
Waterford Estuary†	2008	14				10	4		14	14	23/10/2008	23/11/2008
Waterford Estuary†	2009	4	6			4	6		9	10	01/08/2009	03/11/2009
Waterford Estuary†	2010	7	459		2	20	444		296	466	14/07/2010	27/10/2010
Grand Total		1416	6237	5	130	6394	585	549	1808‡	7658		

† - Common estuaries, ‡ – includes scales found to be unreadable

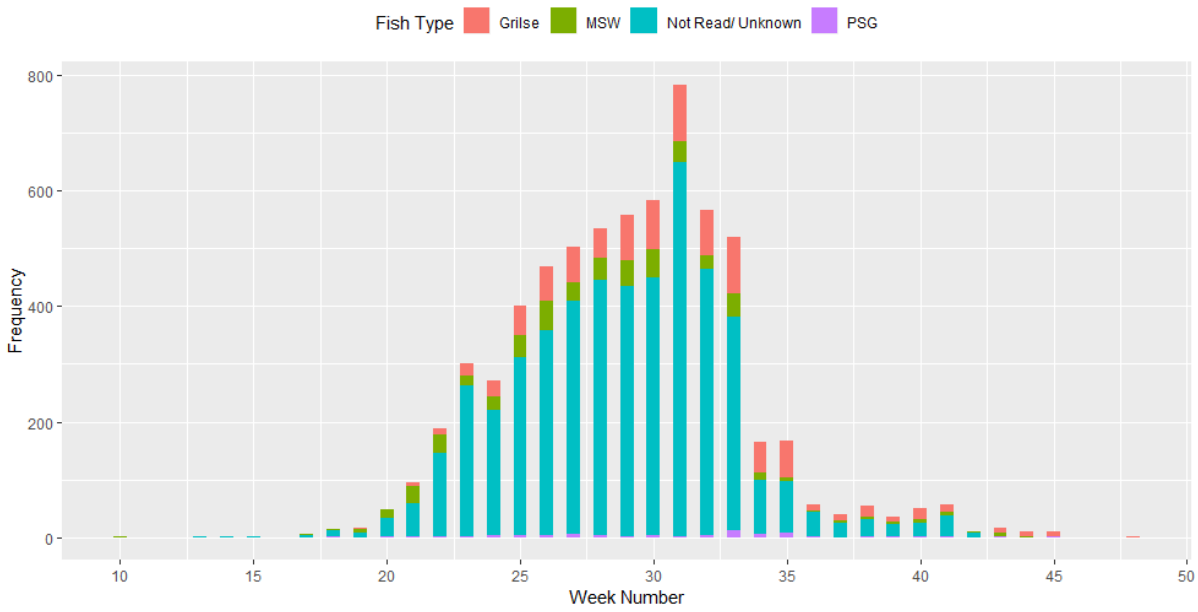


Figure 4.1: The number of salmon scales (Total=7658) in the sample collection by week of capture (where known).

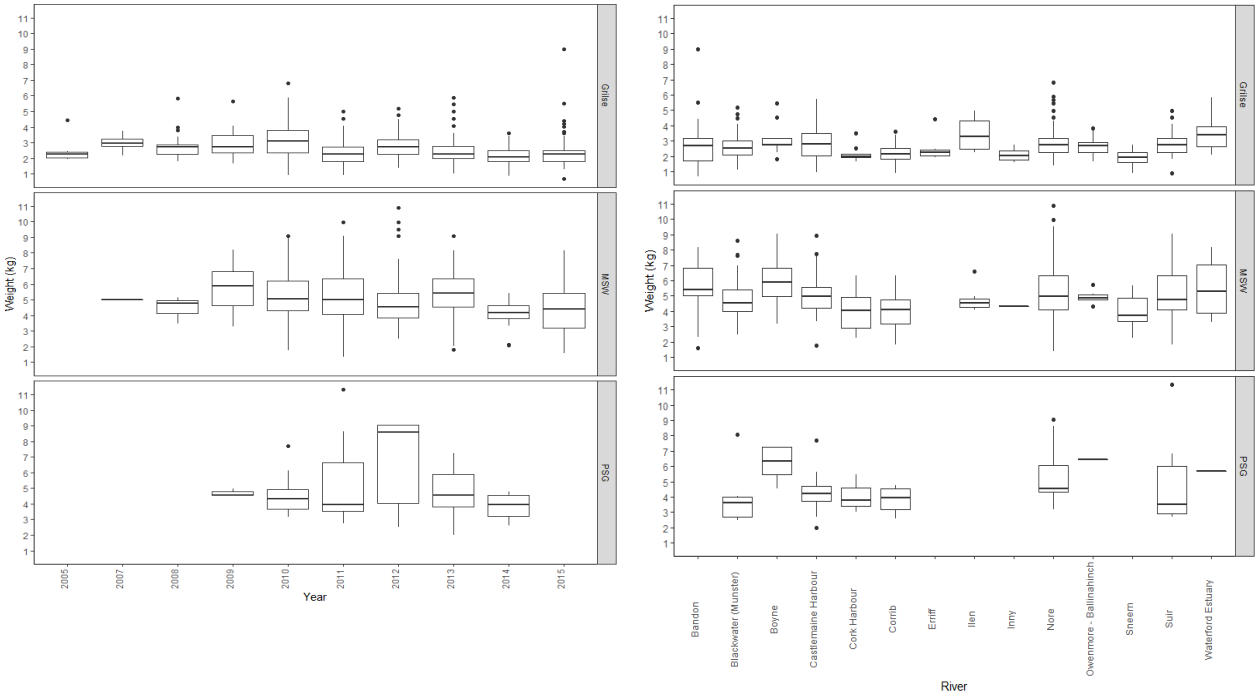


Figure 4.2: Boxplots of weight (kg) of fish life history in different catchments 2005-2015, where both age and weight are known, total=1409.

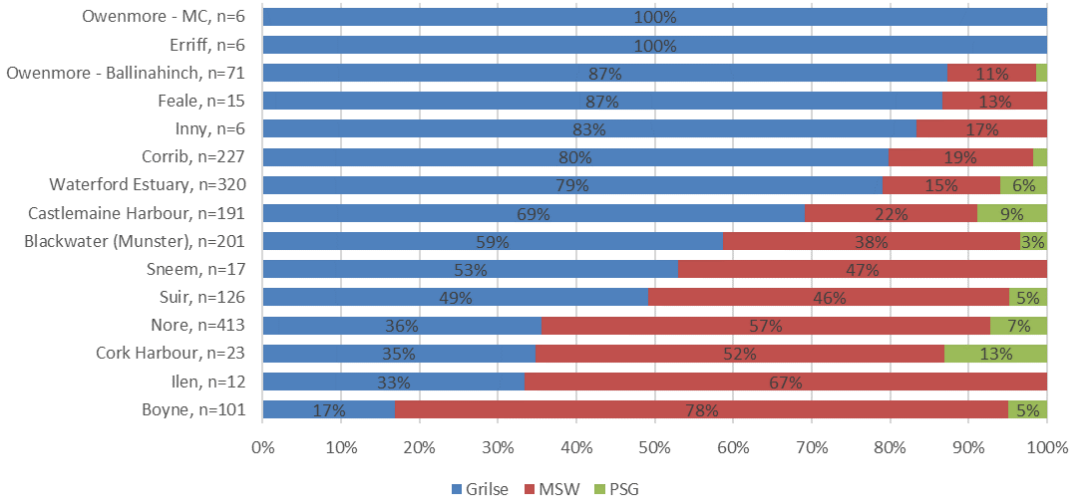


Figure 4.3: Occurrence of fish life history in different catchments 2005-2015, total=1786.

Comparison of Life history over time in various catchments

Scales from the Bandon and the Corrib angling fisheries collected in 2015 were analysed in detail, lengths of the end of each year were back calculated from scale circuli. Both samples were dominated by 2.1+ grilse, although some variation in life history was observed. Average back calculated lengths indicated that faster growing fry were more likely to spend less time in freshwater (fig 4.4) and that marine growth for all fish was similar. Freshwater growth in the Bandon was slower than in the Corrib though sample sizes for some of the lifestyle types was small. Growth at sea was broadly similar for all fish.

Table 4.2: Indicating numbers and percentage of Salmon with various life histories as revealed by scale reading of scales collected from the Corrib and Bandon in 2015.

	Corrib		Bandon	
Salmon Age	**n**	**%**	**n**	**%**
3.1+	13	7%	2	4%
3.2+	2	1%		
2.1+	99	56%	31	61%
2.2+	14	8%	7	14%
2.3+			2	4%
1.1+	40	23%	5	10%
1.2+	8	5%	4	8%
Total	176		51	

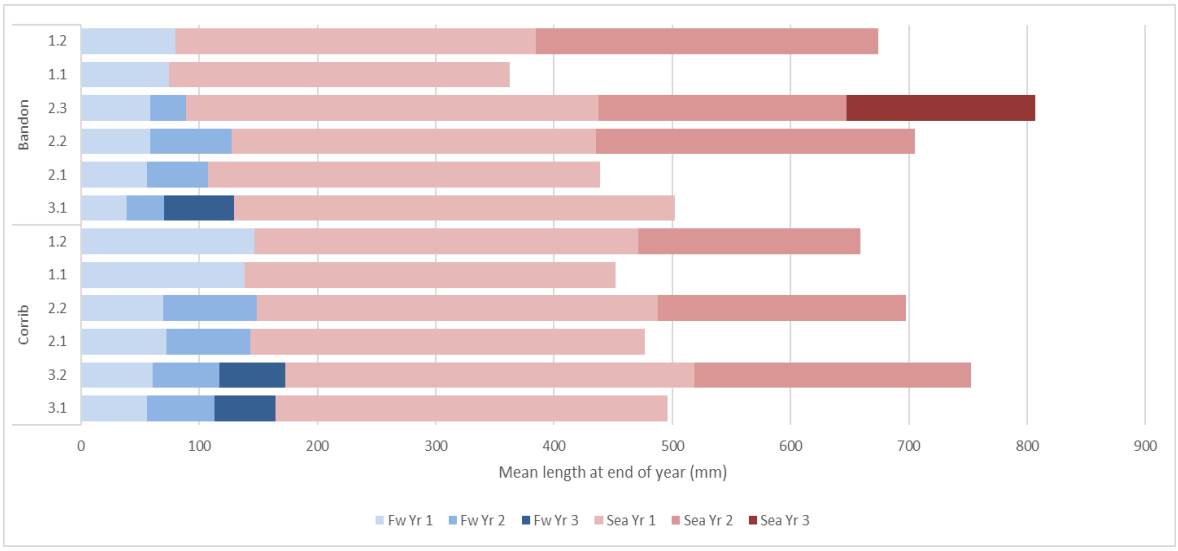
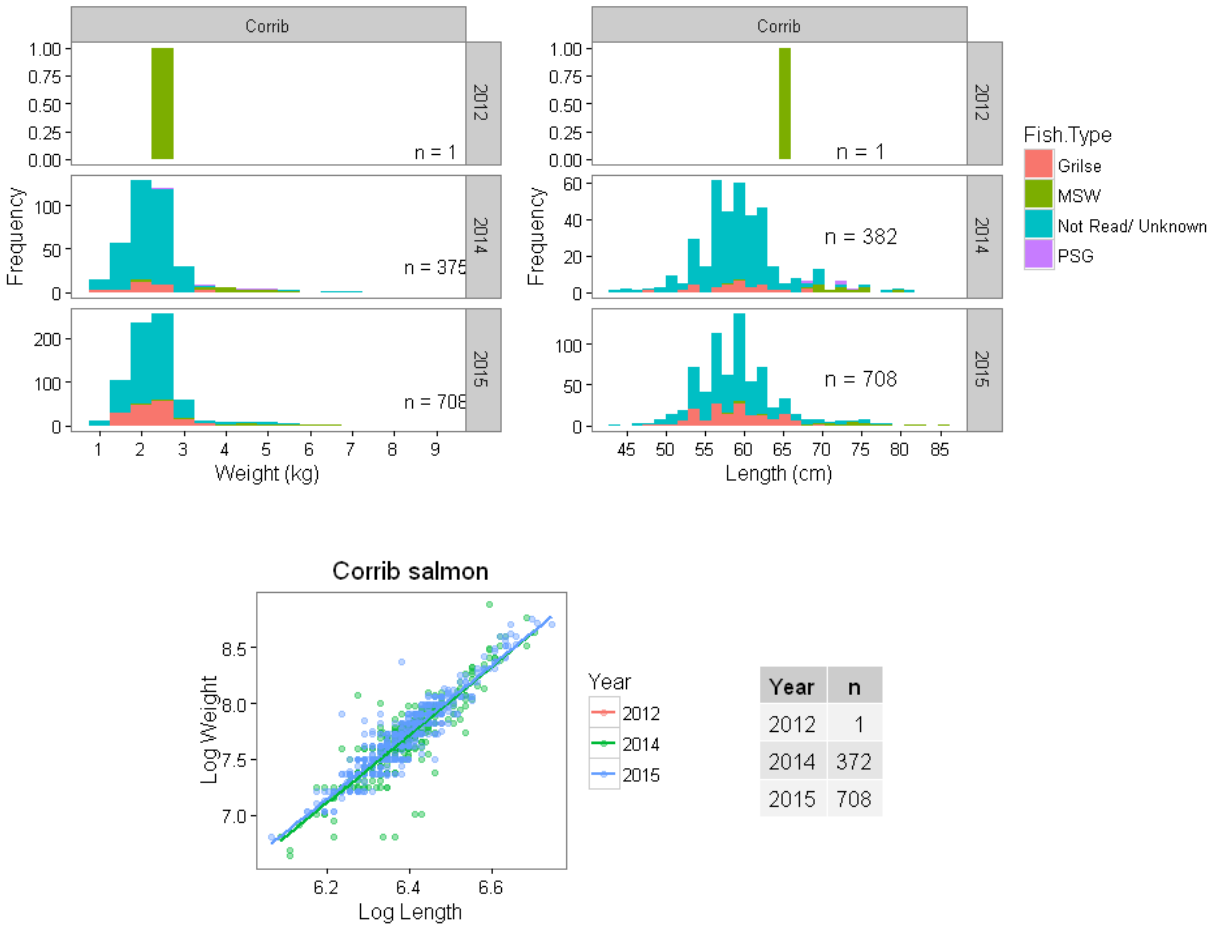


Figure 4.4. Back calculated mean length salmon from Corrib and Bandon 2015, showing length attained during freshwater and marine phases of lifecycle.

Comparison of Size and Age profile of Corrib Salmon



Year	n
2012	1
2014	372
2015	708

Figure 4.6. Summary of lengths and weights of rod caught salmon captured on the Corrib 2012, 2014 and 2015. Top left: Weight frequency histograms; top right, length frequency histograms; Bottom left: Log Length/Log weight relationship; Bottom right: Number of cases of fish with both length and weight information.

Size and Age profile of Bandon Salmon 2015

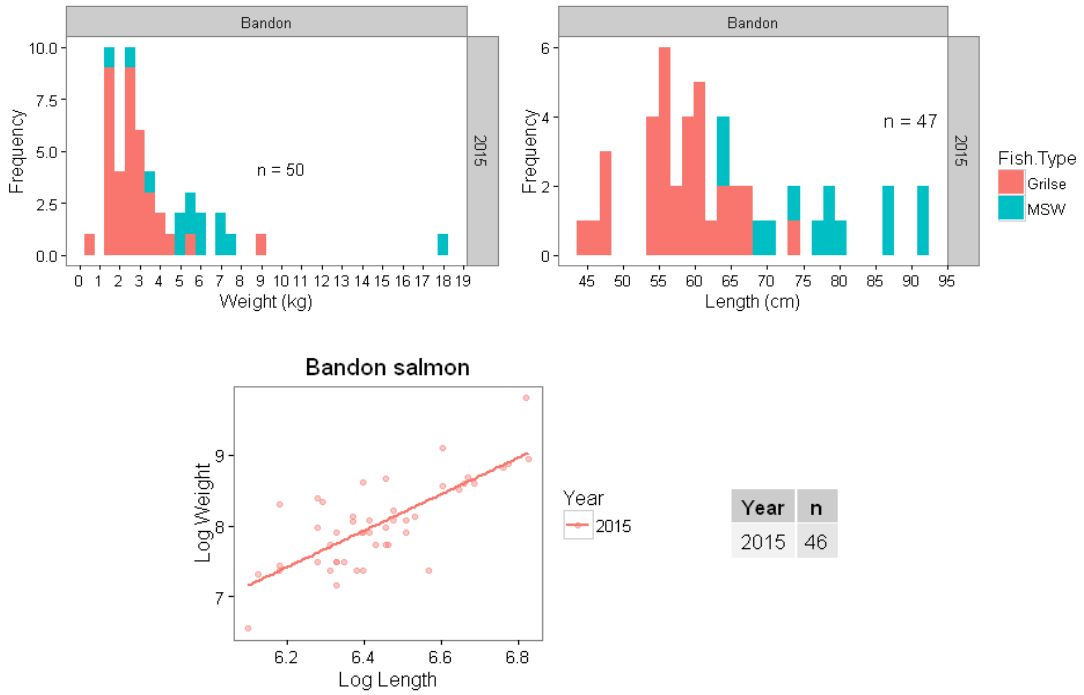


Figure 4.7. Summary of lengths and weights of rod caught salmon captured on the Bandon 2015. Top left: Weight frequency histograms; top right, length frequency histograms; Bottom left: Log Length/Log weight relationship; Bottom right: Number of cases of fish with both length and weight information.

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A. Appendix: Electrofishing Results

Presentation of Electro-fishing Results

Data are presented for rivers electro-fished in each River Basin District in 2015. Results of any previous catchment wide electro-fishing surveys undertaken over the 2007-2015 period are also shown. Data are presented on the current CWEF index and the number of surveys considered in the index calculation. Each system report is presented as a standalone mini-report.

A.1 Neagh Bann IRDB

A.1.1 Summary

Since 2007 five rivers in the Neagh Bann Inland Fisheries District have been surveyed as part of the on-going catchment-wide electrofishing surveys (Table A.1.1.1). At present two rivers are meeting the threshold of 17 salmon fry per 5min. Three catchments, the Flurry, Glyde and Dee were surveyed in this district in 2015. An exploratory survey subsequent to a breach of an impassable weir was conducted on the Fane. The 2015 survey results on the Glyde and Dee were lower much lower than that recorded in 2009 and 2010 and the results on the Flurry was better than that achieved in 2010. The exploratory survey on the Fane found no salmon above the breached weir.

	Survey Year								Current Index	# of Annual Surveys Considered
IFI Code/ River	2008	2009	2010	2011	2012	2013	2014	2015		
002/Flurry			5.24					17.15	11.19	2
003/Castletown		26.41				22.96	13.59		**20.99**	3
004/Fane		16.17			22.09			8.94*	**19.13**	2
005/Glyde	2.49	17.08	31.61					5.56	14.18	4
006/Dee	8.55	16.92	21.72	20.13				10.51	15.56	5

Table A.1.1.1: Catchment-wide Electrofishing data for the Neagh Bann IRFB 2007-2015 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate. *Fane exploratory survey.

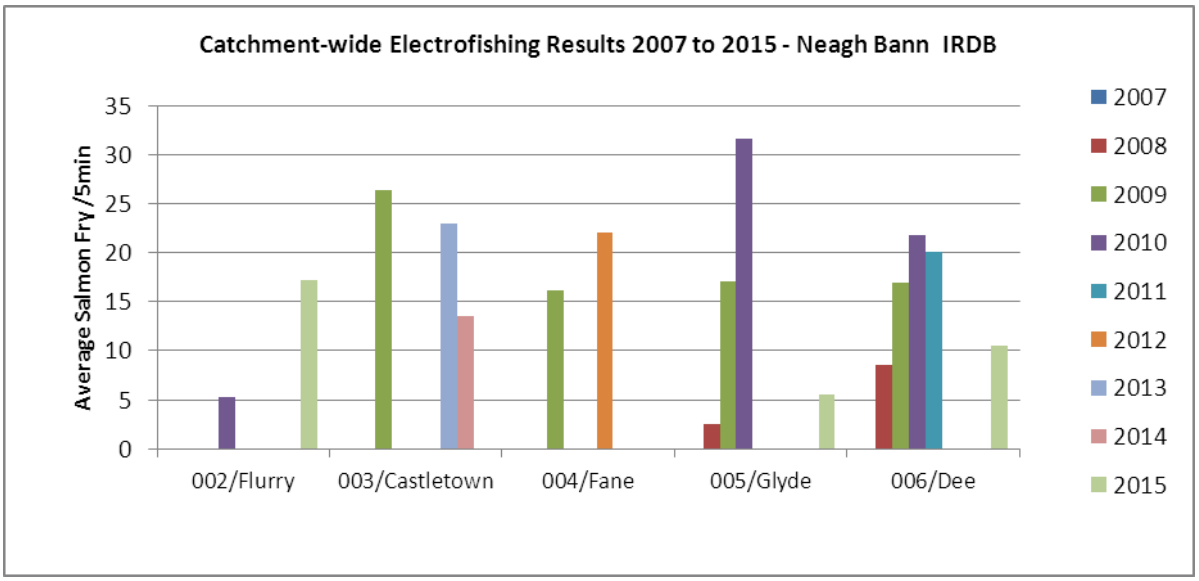


Figure A.1.1.1: Summary of CWEF results in Neagh Bann IRDB 2007-2015.

A.1.2 The Flurry River.

IFI Salmon Catchment #: 2
2015 survey dates: 11/9/2015
Mean Salmon Fry/5 min (2015): 17.15 fry/5min.
CWEF Index: 11.19 fry/5min.

Sampling carried out by:

Ronan McCormick
Jimmy McCabe

Fish Species Present:

Brown Trout
European Eel
Salmon

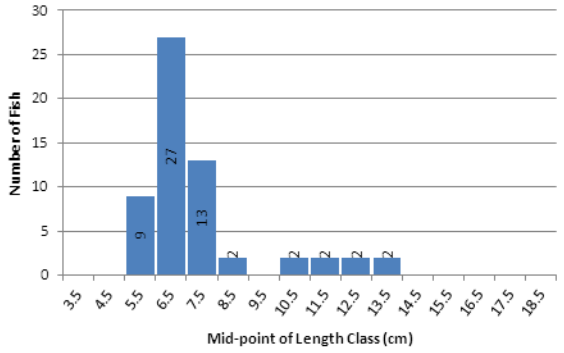


Figure A.1.2.1: Length distribution of salmon captured in 2015 CWEF survey on the Flurry Catchment.

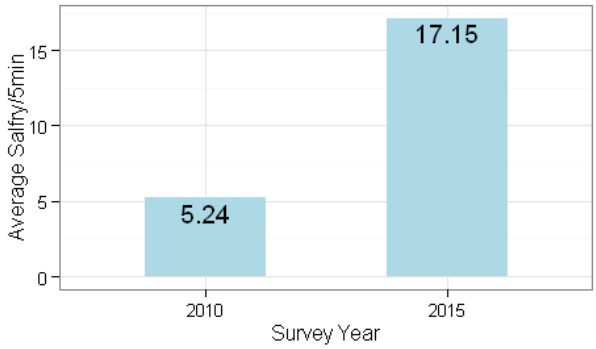


Figure A.1.2.2: Comparison of mean salfry/5 min for all surveys on the Flurry catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2010	5	3				2.7
2015	4					5.4

Table A.1.2.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	123	-69	Closed	5.24	
2010	2011	123	-69	Closed		
2011	2012	123	-69	Closed		
2012	2013	123	-65	Closed		
2013	2014	427	-329	Closed		
2014	2015	427	-328	Closed	17.15	11.19

Table A.1.2.2: Conservation limits and provisional returns on the Flurry catchment along with the 2015 CWEF fishing result.

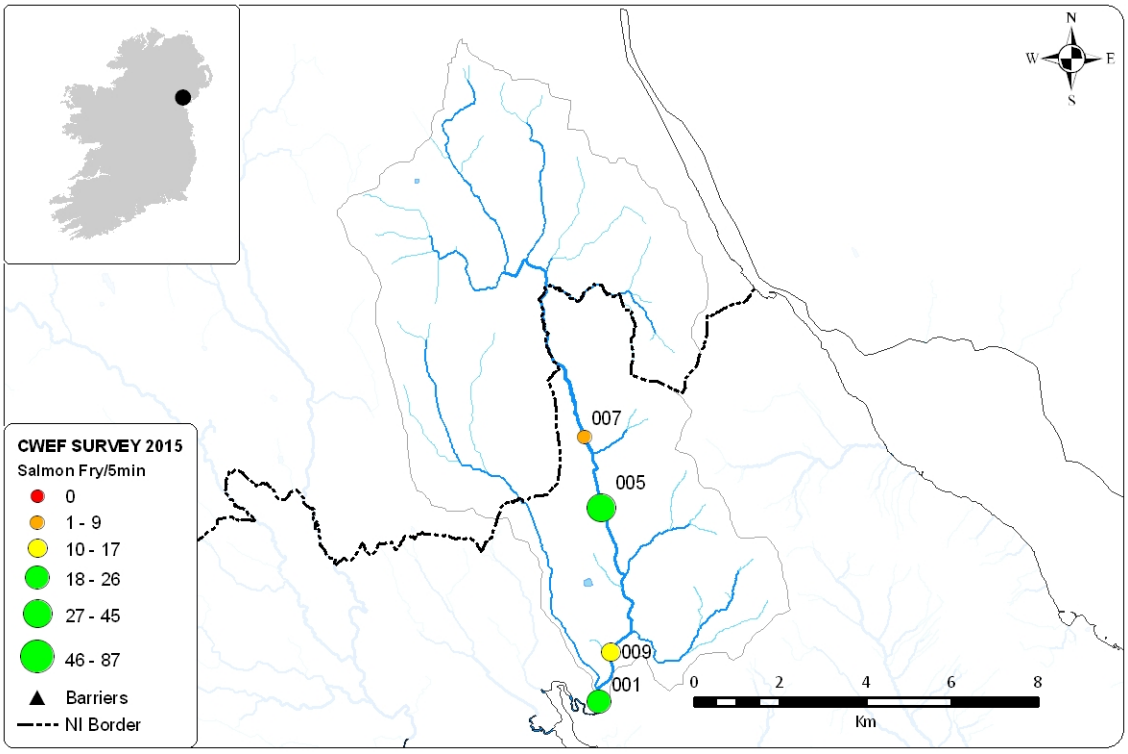
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during Sept 2015. The survey comprised 4 sites in the section of the river running through the republic, all of which were included in the analysis. Salmon fry were present at all sites. The maximum fry catch was 25 salmon at site 5. The mean catch of included sites was 17.15 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 6.5cm.

Conclusion

The Flurry had a mean catch of 17.15 salfry/5min in 2015 resulting in a combined average of 11.19 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	308151	309867	3	1	17	Include	22.67
5	308197	314361	2	1	25	Include	33.93
7	307806	316021	2	3	2	Include	2.67
9	308423	311014	3	2	7	Include	9.33

Table A.1.2.3: Site specific results of CWEF on the Flurry catchment in 2015.



Map A.1.2.1: Locations of 2015 CWEF survey sites on Flurry River.

A.1.3 The Fane River

IFI Salmon Catchment #: 4
2015 survey dates: 9/9/2014
Mean Salmon Fry/5 min (2015): Not Calculated
CWEF Index: 19.13 fry/5min.

Sampling carried out by:

Ronan McCormick
Tony Holmes

Fish Species Present:

Brown Trout
European Eel
Perch
Salmon
Stone Loach

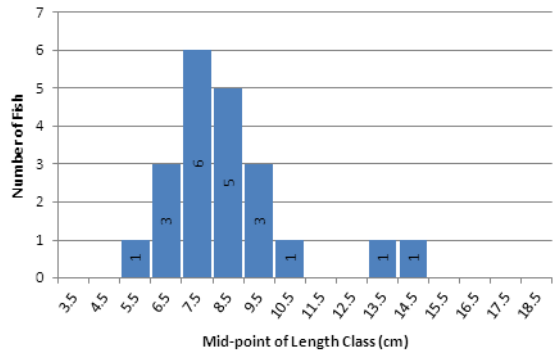


Figure A.1.3.1: Length distribution of salmon captured in 2015 CWEF survey on the Fane Catchment.

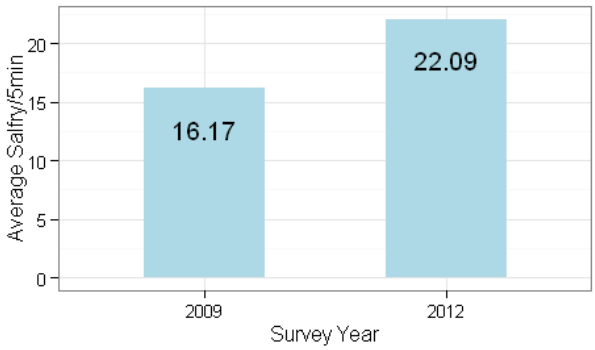


Figure A.1.3.2: Comparison of mean salfry/5 min for all CWEF surveys on the Fane catchment to 2015.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2008	2009	542	214	Open	16.17	
2009	2010	542	273	Open		
2010	2011	542	387	Open		
2011	2012	542	603	Open	22.09	
2012	2013	542	816	Open		
2013	2014	1172	264	Open		
2014	2015	1176	411	Open		19.13

Table A.1.3.1: Conservation limits and provisional returns on the Fane catchment along with the CWEF fishing results.

This partial survey was carried out during Sept 2015 mainly focussed on determining if adult salmon had spawned above Art Hamill weir in 2014 following the weir breach. The survey comprised 11 sites: salmon were recorded at both sites surveyed below the weir. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 5.5cm.

No salmon were recorded at any of the sites above the site of the weir. The weir itself is passable to salmon. Sites 9 and 29 upstream and downstream of Ballynacarry Bridge were suitable for salmon spawning; at some time in the past gravel had been imported to these sites, though at time of this survey the gravel was somewhat silted up.

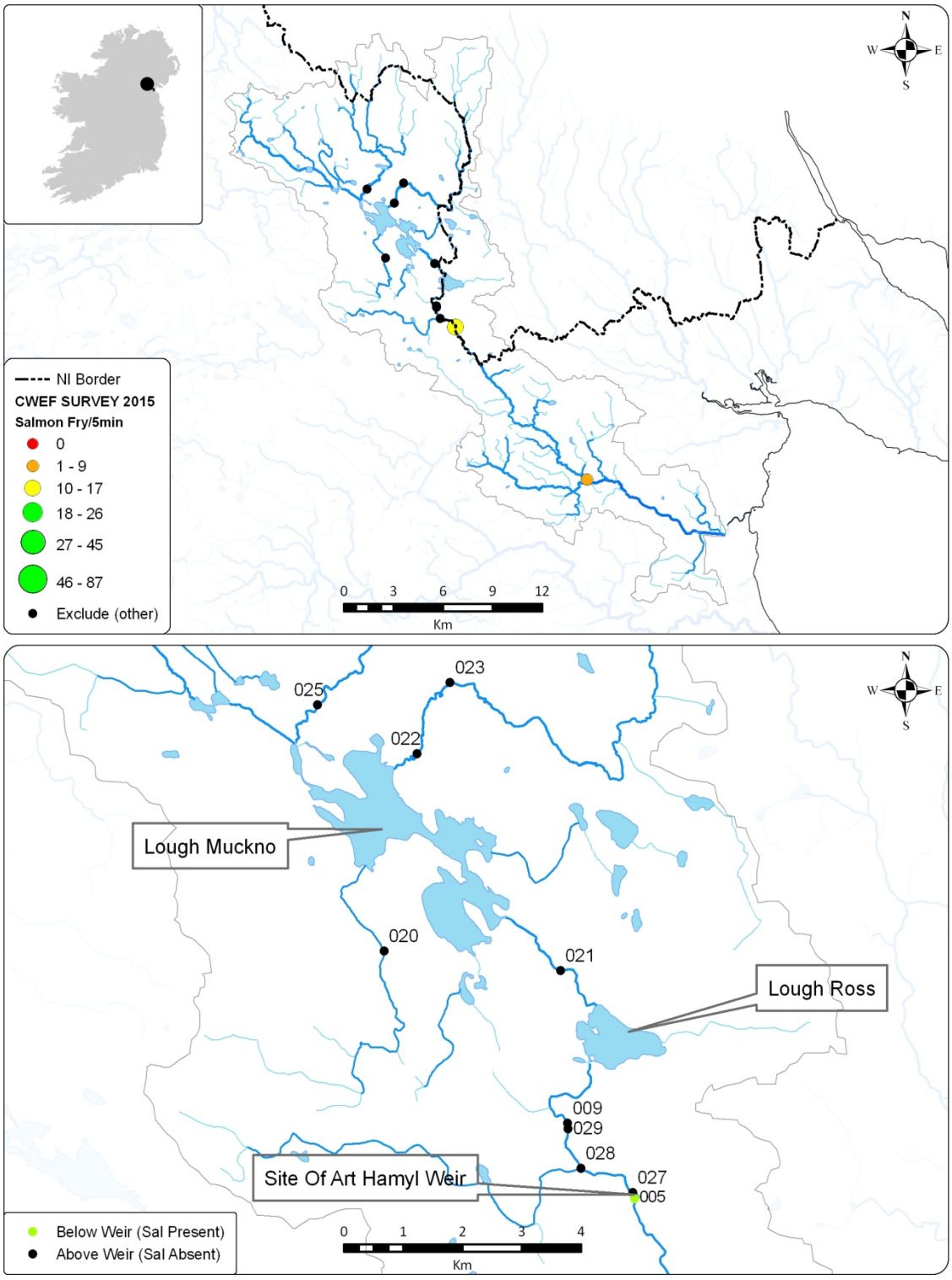
Conclusion

This survey found no juvenile salmon at sites upstream of Art Hamill weir.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	296615	303725	3		6	Below Barrier	7.5
5	288635	312938	2	2	9	Below Barrier	10.38
9	287500	314210	3	2	0	Above Barrier	
20	284399	317107	2		0	Above Barrier	
21	287379	316774	3	3	0	Above Barrier	
22	284956	320417	3	2	0	Above Barrier	
23	285513	321619	3	1	0	Above Barrier	
25	283275	321245	3	2	0	Above Barrier	
27	288599	313047	3	3	0	Above Barrier	
28	287724	313447	3	2	0	Above Barrier	
29	287510	314111	3		0	Above Barrier	

Table A.1.3.3: Site specific results of CWEF on the Fane catchment in 2015.

Photo A.1.3.1: Breached section of Art Hamill Weir on the Fane River.



Map A.1.3.1: Locations of 2015 survey sites on Fane River; Top Panel: overview of catchment, Below: Detail of upper reaches of Catchment (border running along certain stretches of River not shown for clarity).

A.1.4 The Glyde River.

IFI Salmon Catchment #: 5
2015 survey dates: 3/9/2015 - 7/9/2015
Mean Salmon Fry/5 min (2015): 5.59 fry/5min.
CWEF Index: 14.18 fry/5min.

Sampling carried out by:

Ronan McCormick
Tony Holmes
Seamus Kelledy

Fish Species Present:

Brown Trout
European Eel
Minnow
Roach
Salmon
Stone Loach
Three-spined Stickleback

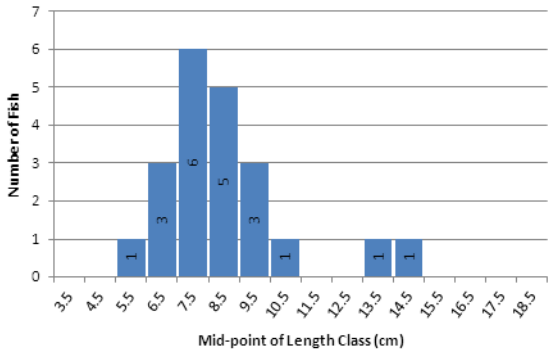


Figure A.1.4.1: Length distribution of salmon captured in 2015 CWEF survey on the Glyde Catchment.

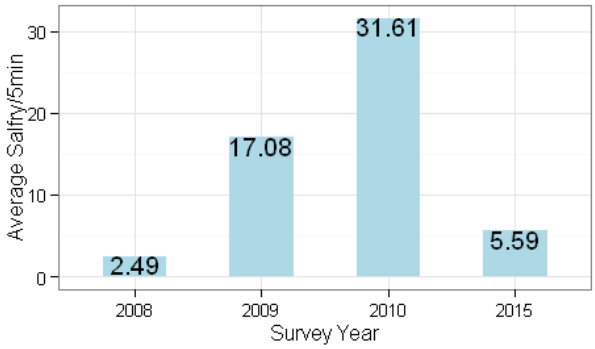


Figure A.1.4.2: Comparison of mean salfry/5 min for all surveys on the Glyde catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2008	16					10.3
2009	14	1				11.0
2010	14		1			11.8
2015	114					11.8

Table A.1.4.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	2172	-1692	Catch and Release	31.61	
2010	2011	2172	-1717	Catch and Release		
2011	2012	2172	-1835	Catch and Release		
2012	2013	2172	-1753	Catch and Release		
2013	2014	1856	-368	Catch and Release		
2014	2015	1856	200	Brown Tag	5.56	5.56

Table A.1.4.2: Conservation limits and provisional returns on the Glyde catchment along with the 2015 CWEF fishing result.

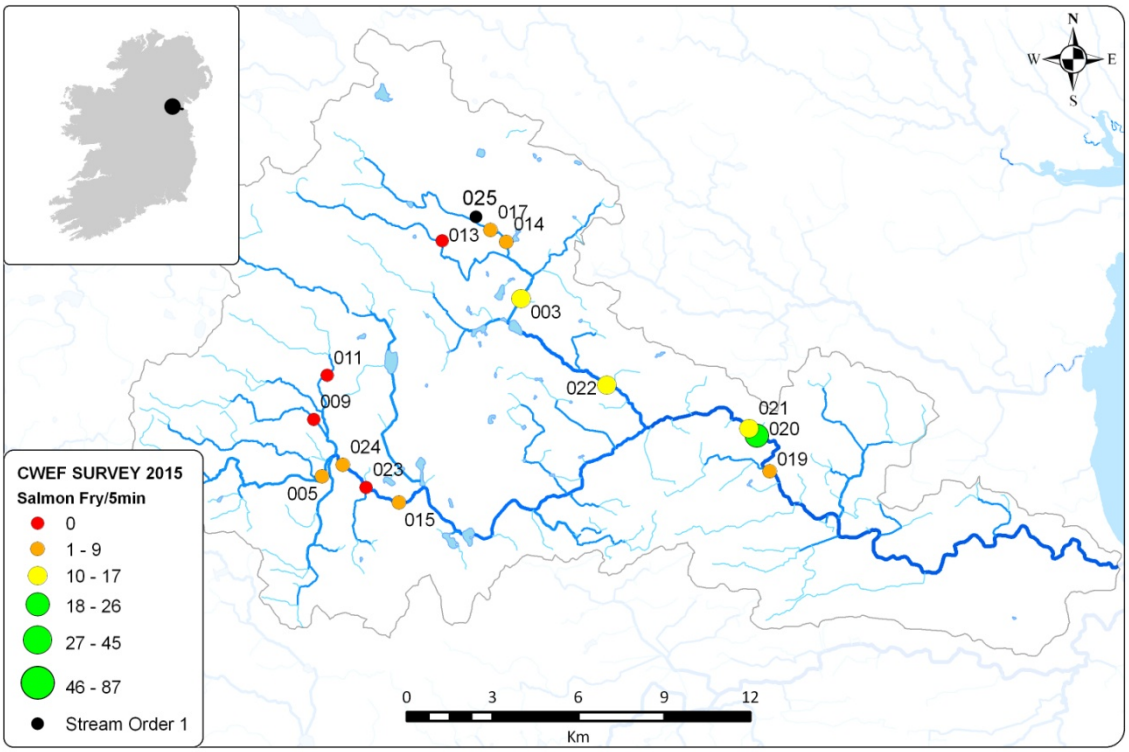
This survey, the fourth of this catchment in the 2007 to 2015 period, was carried out during September. The survey comprised 15 sites, 14 of which were included in the analysis. Salmon fry were present at 10 sites. The maximum fry catch was 19 salmon fry at site 20. The mean catch was 5.59 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 7.5cm.

Conclusion

The Glyde had a mean catch of 5.59 salfry/5min in 2015. This was a very poor result compared to those of the most recent two surveys and results in a combined annual average of 14.18 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
3	286833	303759	3	2	9	Include	10.38
5	279878	297536	3	1	1	Include	1.36
9	279576	299538	2	1	0	Include	0
11	280054	301081	2	1	0	Include	0
13	284068	305783	2	2	0	Include	0
14	286316	305732	2	2	2	Include	2.33
15	282566	296617	4	1	2	Include	2
17	285761	306148	2	2	3	Include	3.69
19	295526	297702	5	3	5	Include	6.67
20	295075	298974	5	2	19	Include	25.61
21	294804	299212	5	2	8	Include	12
22	289826	300728	4	2	8	Include	10.18
23	281408	297157	4	2	0	Include	0
24	280605	297929	4	1	3	Include	3.6
25	285252	306624	1	2	0	Stream order<2	

Table A.1.4.3: Site specific results of CWEF on the Glyde catchment in 2015.



Map A.1.4.1: CWEF site locations 2015 on the Glyde River.

A.1.5 The Dee River

IFI Salmon Catchment #: 6
2015 survey dates: 13/8/2015 - 07/9/2015
Mean Salmon Fry/5 min (2015): 10.51 fry/5min.
CWEF Index: 15.56 fry/5min.

Sampling carried out by:

Brendan Cusack
Ronan McCormick
Seamus Kelledy
Tom Duffy

Fish Species Present:

Brown Trout
European Eel
Minnow
Lamprey
Salmon
Stone Loach
Three-spined Stickleback

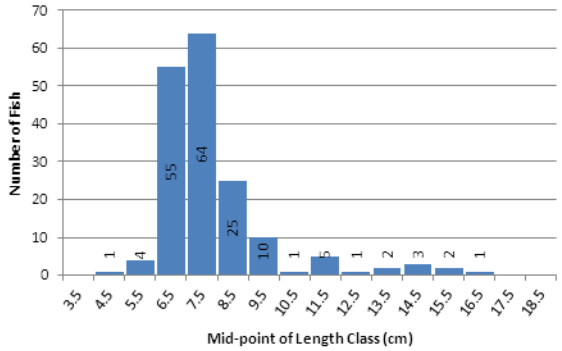


Figure A.1.5.1: Length distribution of salmon captured in 2015 CWEF survey on the Dee Catchment.

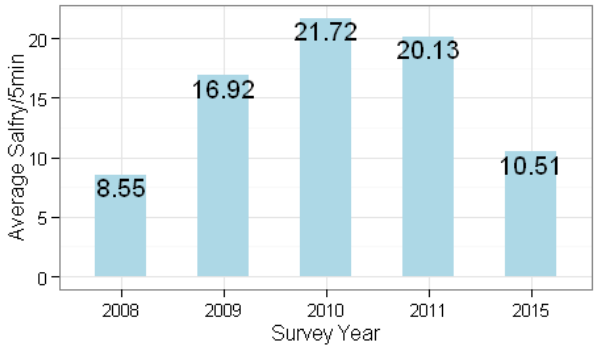


Figure A.1.5.2: Comparison of mean salfry/5 min for all surveys on the Dee catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2008	29					6.9
2009	18	1				10.6
2010	20					10
2011	20					10
2015	20					10

Table A.1.5.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	2409	-2108	Closed	21.72	
2010	2011	2409	-2130	Closed	20.13	
2011	2012	2195	-1883	Closed		
2012	2013	2195	-1607	Catch and Release		
2013	2014	943	-635	Catch and Release		
2014	2015	944	-471	Catch and Release	10.51	15.32

Table A.1.5.2: Conservation limits and provisional returns on the Dee catchment along with the 2015 CWEF fishing result.

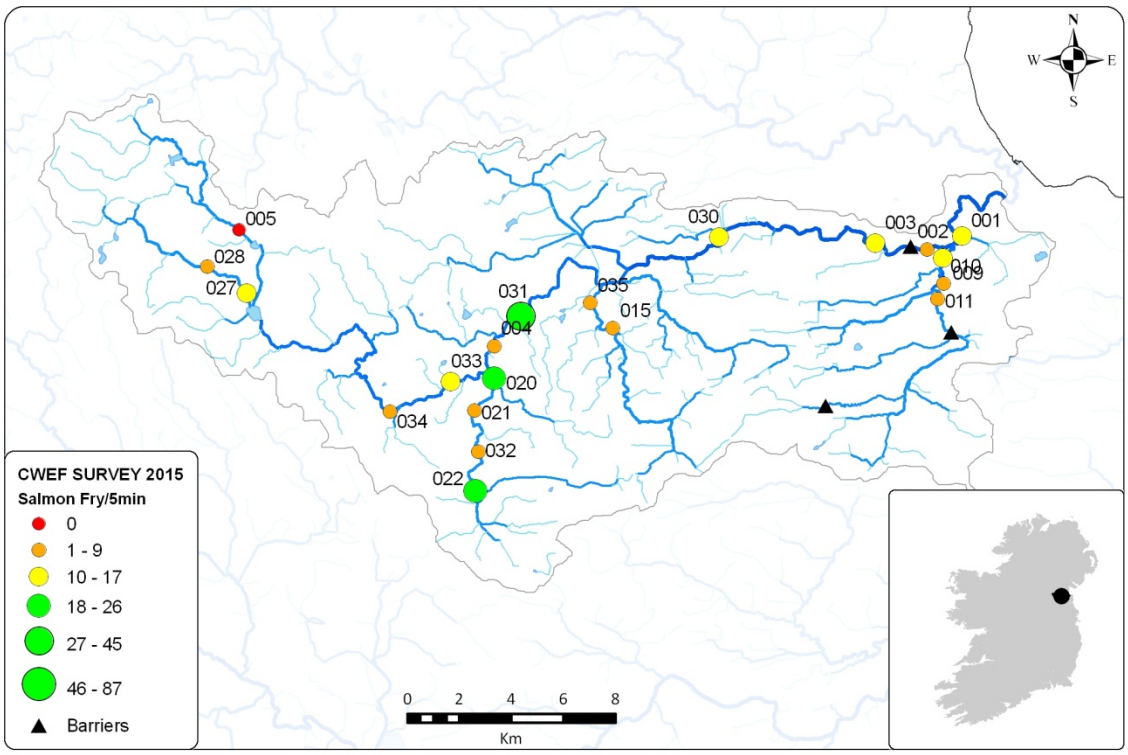
This survey, the fifth of this catchment in the 2007 to 2015 period, was carried out during August and Sept 2015. The survey comprised 20 sites, all of which were included in the analysis. Salmon fry were present at all main channel sites and absent from just one site in the upper reaches of the catchment. The maximum fry catch was 21 salmon at site 31. The mean catch of included sites was 10.51 salmon fry/5min. More than one cohort of juvenile salmon was captured; lengths ranged from 6.5 to 14.5. The modal length category of 0+ fry caught was 7.5cm.

Conclusion

The Dee had a comparatively low mean catch of 10.51 salfry/5min in 2015 resulting in a combined annual average of 15.56 salmon fry/5min which is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	306606	291181	5	2	12	Include	17
2	305269	290647	5	2	5	Include	6.43
3	303272	290905	5	1	12	Include	16.29
4	288592	286932	4	2	7	Include	8.75
5	278766	291410	3	1	0	Include	0
9	305887	290323	4	1	6	Include	10
10	305892	289331	4	1	6	Include	6
11	305674	288746	3	2	4	Include	5.33
15	293167	287621	3	2	2	Include	2.57
20	288604	285712	3	1	19	Include	24.76
21	287836	284453	3	2	5	Include	6.36
22	287868	281360	3	2	14	Include	19.25
27	279072	288975	3	2	9	Include	13.03
28	277537	289981	3	3	5	Include	6.72
30	297259	291132	5	1	10	Include	14
31	289615	288073	4	1	21	Include	28.64
32	287980	282877	3	2	3	Include	4
33	286933	285583	4	2	7	Include	9.92
34	284577	284416	4	1	3	Include	4.24
35	292299	288589	3	1	5	Include	6.84

Table A.1.5.3: Site specific results of CWEF on the Dee catchment in 2015.



Map A.1.5.1: CWEF site locations 2015 on Dee River.

A.2 Eastern River Basin District

A.2.1 Summary

Since 2007, nine salmon rivers have been surveyed in the Eastern River Basin District (ERFB) as part of the on-going catchment-wide electrofishing surveys. These are presented in (Table A.2.1.1). The Dargle and Vartry catchment were surveyed in this district in 2015. Two catchments, the Boyne and the Lower Liffey, are currently above the threshold of 17 salmon fry/5min. Two catchments were surveyed in 2015, both results were low and both catchments remain under the 17 sal fry/5min threshold.

	Survey Year									Current Index	# of Annual Surveys Considered
IFI Code/ River	2007	2008	2009	2010	2011	2012	2013	2014	2015		
008/Boyne		21.91	17.54	19.38				13.25		18.02	4
013/Broadmeadow				0.00						0.00	1
014/Tolka					1.08	0.00				0.54	2
015/Liffey Lower		21.33	40.12	25.16	17.47	12.12				23.24	5
015/Liffey Upper		12.93	5.11	8.15	16.20	10.13				10.51	5
016/Dodder					13.93					13.93	1
018/Dargle			1.40	2.53	7.52				4.19	3.91	4
021/Vartry		10.00	15.11	2.54	15.07				5.34	9.61	5
026/Avoca		3.79	5.56	5.20	18.88	5.15				7.72	5

Table A.2.1.1: Catchment-wide Electrofishing data for ERFB 2007- 2015 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

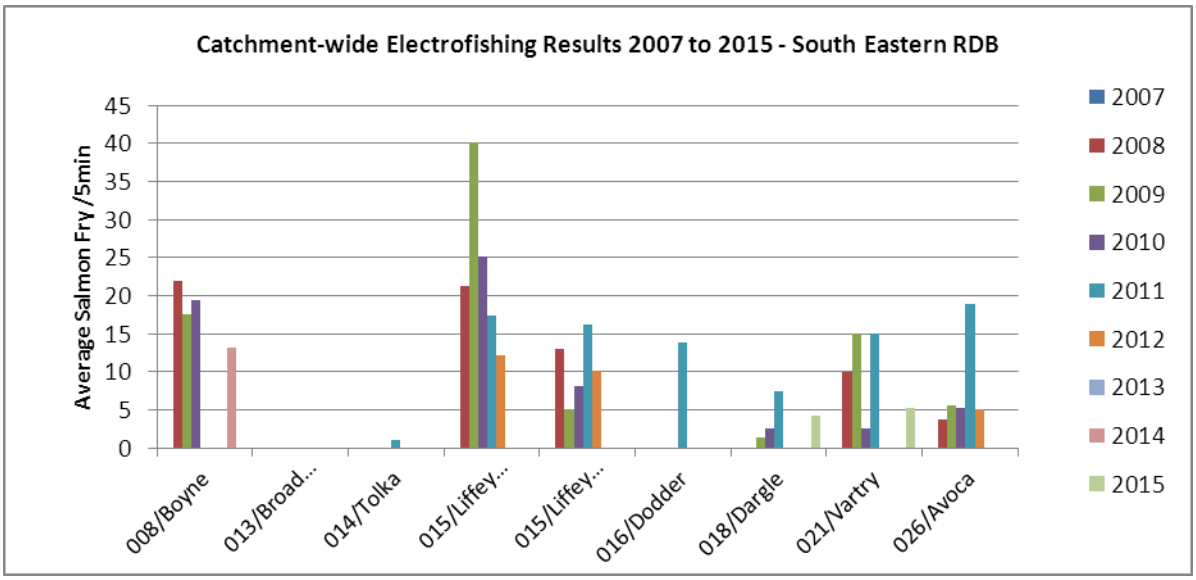


Figure A.2.1.1. Summary of CWEF results in ERFB from 2007 to 2015.

A.2.2 The Dargle River

IFI Salmon Catchment #: 18
2015 survey dates: 12/8/2015 – 25/9/2015
Mean Salmon Fry/5 min (2015): 4.19 fry/5min.
CWEF Index: 3.91 fry/5min.

Sampling carried out by:

Alan Carter
Joe Delaney
Jarlaith Gallagher
Maurice Carolan

Fish Species Present:

Brown Trout
Sea Trout
European Eel
Flounder
Salmon

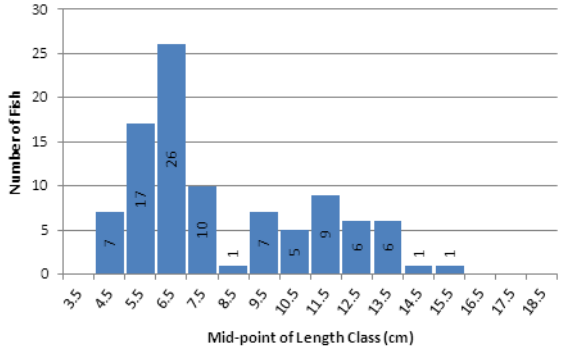


Figure A.2.2.1: Length distribution of salmon captured in 2015 CWEF survey on the Dargle Catchment.

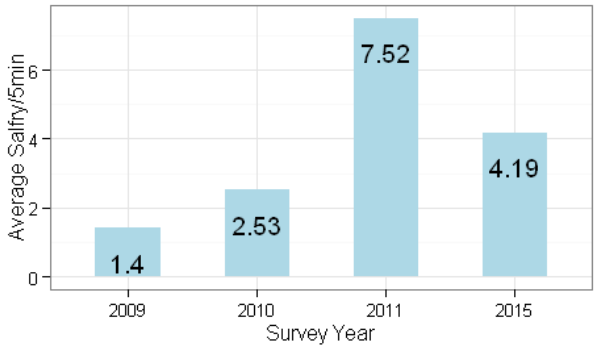


Figure A.2.2.2: Comparison of mean salfry/5 min for all surveys on the Dargle catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2009	5	1				12.9
2010	17	1				4.3
2011	16					4.8
2015	17					4.6

Table A.2.2.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	639	-415	Closed	2.53	
2010	2011	639	-395	Closed	7.52	
2011	2012	639	-395	Closed		
2012	2013	639	-395	Closed		
2013	2014	731	-606	Closed		
2014	2015	733	-610	Closed	4.19	3.91

Table A.2.2.2: Conservation limits and provisional returns on the Dargle catchment along with the 2015 CWEF fishing result.

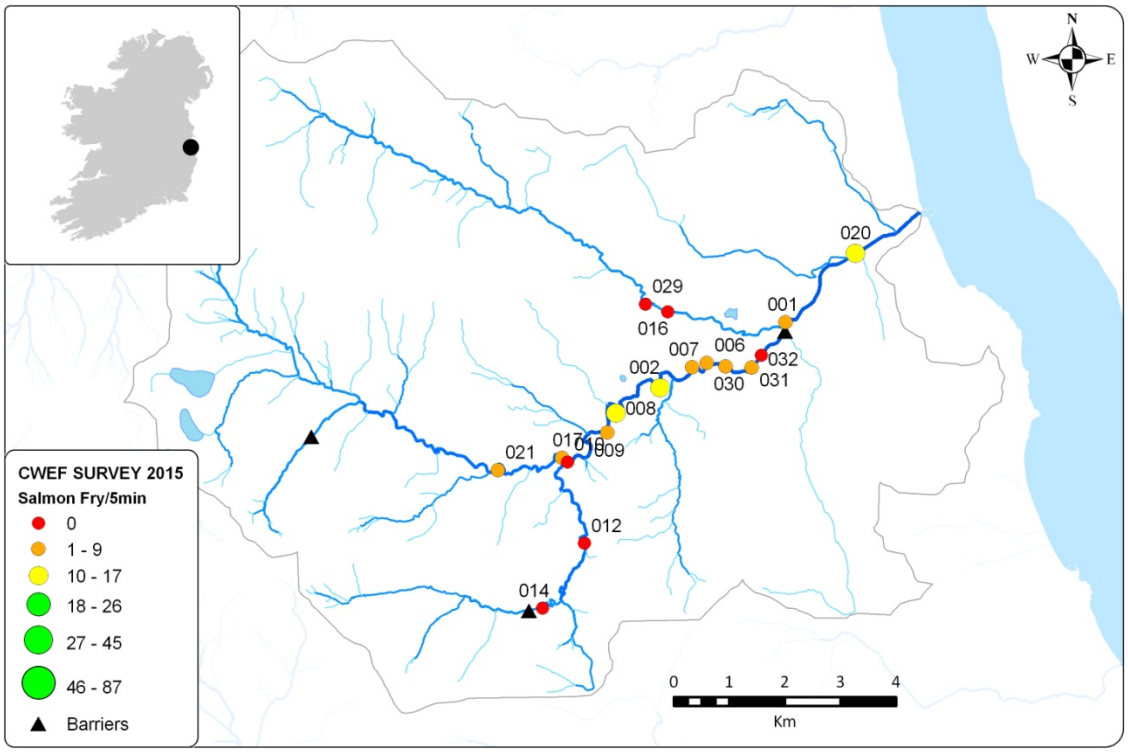
This survey, the fourth of this catchment in the 2007 to 2015 period, was carried out during August and Sept 2015. The survey comprised 17 sites, all of which were included in the analysis giving a good coverage of 4.6 km between survey sites. Salmon fry were present at 11 sites. The maximum fry catch was 16 salmon at site 20. The mean catch of included sites was 4.19 salmon fry/5min. The modal length category of 0+ fry caught was 5.5cm.

Conclusion

The Dargle had a mean catch of 4.19 salfry/5min in 2015 resulting in a combined annual average of 3.91 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	324381	217262	5	2	3	Include	3
2	322117	216089	5	2	10	Include	11.67
6	322964	216532	5	2	6	Include	7.71
7	322697	216459	5	2	1	Include	1
8	321324	215635	5	2	9	Include	10.8
9	321173	215279	5	2	6	Include	6.67
10	320449	214755	4		0	Include	0
12	320756	213295	4	1	0	Include	0
14	320001	212124	3		0	Include	0
16	322256	217460	3	2	0	Include	0
17	320351	214825	4	2	4	Include	5.5
20	325635	218508	5	2	16	Include	16
21	319196	214605	4	2	2	Include	2.8
29	321855	217600	3	2	0	Include	0
30	323302	216472	5	3	3	Include	4.5
31	323773	216450	5	3	1	Include	1.5
32	323941	216676	5	3	0	Include	0

Table A.2.2.3: Site specific results of CWEF on the Dargle catchment in 2015.



Map A.2.2.1: CWEF survey locations 2015 on Dargle River.

A.2.3 The Vartry River

IFI Salmon Catchment #: 21
2015 survey dates: 8/6/2015 – 29/8/2015
Mean Salmon Fry/5 min (2015): 5.34 fry/5min.
CWEF Index: 9.61 fry/5min.

Sampling carried out by:

Alan Carter
Joe Delany
Jarlaith Gallagher

Fish Species Present:

Brown Trout
European Eel
Minnow
Salmon
Flounder

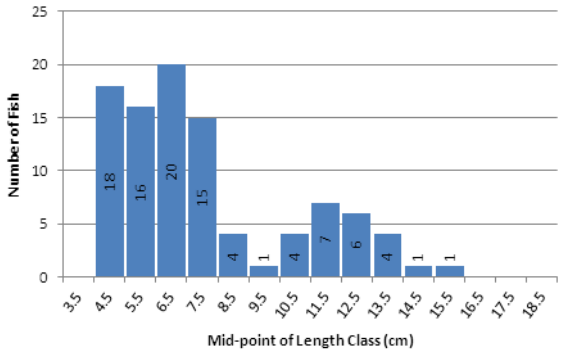


Figure A.2.3.1: Length distribution of salmon captured in 2015 CWEF survey on the Vartry Catchment.

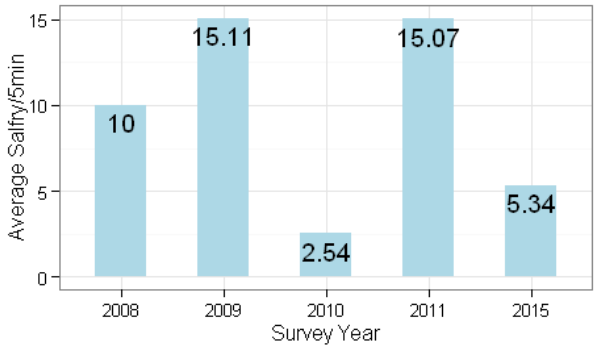


Figure A.2.3.2: Comparison of mean salfry/5 min for all surveys on the Vartry catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2008	4					11.03
2009	4					11.03
2010	13					3.39
2011	11					4.01
2015	13			2		3.39

Table A.2.3.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	189	-88	Closed	2.54	
2010	2011	189	-88	Closed	15.07	
2011	2012	189	-88	Closed		
2012	2013	189	-88	Closed		
2013	2014	274	-175	Closed		
2014	2015	273	-175	Closed	5.34	9.61

Table A.2.3.2: Conservation limits and provisional returns on the Vartry catchment along with the 2015 CWEF fishing result.

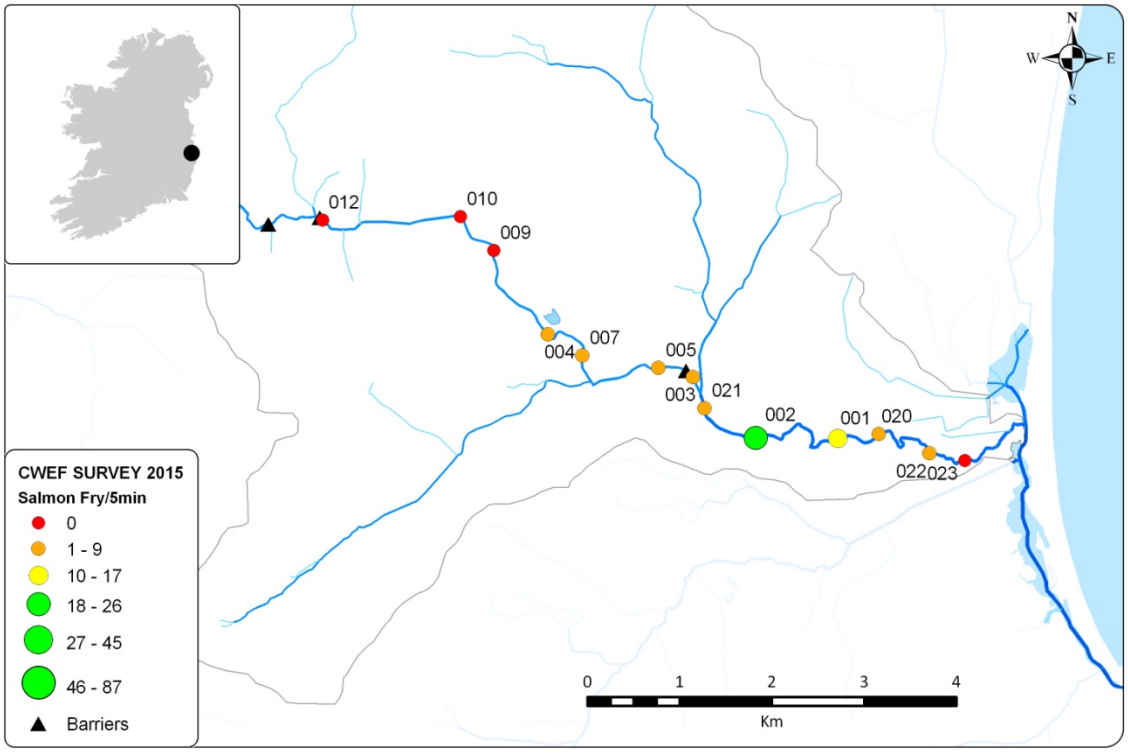
This survey, the fifth of this catchment in the 2007 to 2015 period, was carried out during Sept 2015; two sites surveyed in June were revisited in September. The survey comprised 13 sites, all of which were included in the analysis giving a very good coverage of 3.39 km of river channel per survey site. Salmon fry were present at 9 sites. The maximum fry catch was 19 salmon at site 2. The mean catch of included sites was 5.34 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 6.5cm.

Conclusion

The Vartry had a mean catch of 5.34salfry/5min in 2015 resulting in a combined annualof 9.61 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	328643	196699	4		10	Exclude	
1	328643	196699	4	2	13	Include	14.3
2	327752	196709	4	2	19	Include	21.81
3	327073	197363	3		2	Exclude	
3	327073	197363	3	2	5	Include	5
4	325501	197823	3	1	3	Include	3.75
5	326698	197462	3	2	6	Include	6
7	325876	197593	3	2	1	Include	1.67
9	324912	198737	3	2	0	Include	0
10	324549	199102	3	1	0	Include	0
12	323054	199065	3	2	0	Include	0
20	329087	196747	4	1	6	Include	7.38
21	327196	197025	4	2	7	Include	7.54
22	329638	196535	4	2	2	Include	2
23	330020	196461	4	2	0	Include	0

Table A.2.3.3: Site specific results of CWEF on the Vartry catchment in 2015.



Map A.2.3.1: CWEF survey site locations 2015 on the Vartry River.

A.3 South Eastern River Basin District

A.3.1 Summary

Since 2007, twelve rivers have been surveyed in the South Eastern River Basin District (SERBD) as part of the on-going catchment-wide electrofishing surveys. These are presented in (Table A.3.1.1). Five rivers currently have a survey average salmon fry capture rate of greater than 17 fry/5min (current index in Table A3.1.1.1): Slaney, Corock, Nore and Colligan and the Barrow. The Owenavorragh, Mahon and Tay were surveyed in 2015. All three results were low and those catchments remain under the 17 sal fry/5min threshold.

	Survey Year									Current Index	# of Annual Surveys Considered
IFI Code/ River	2007	2008	2009	2010	2011	2012	2013	2014	2015		
028/Owenavorragh				19.76			0.33		4.61	8.23	3
031/Slaney	19.05		15.94	18.42				17.68		17.77	4
032/Duncormick								11.54		11.54	1
033/Corock					37.11					37.11	1
034/Owenduff (Wexford)				4.97	10.65	15.91				10.51	3
035/Pollmounty	4.33									4.33	1
036/Aughnavaud	1.00		0.00	0.00	1.00	6.47				1.69	5
037/Barrow	18.92		11.10	8.83	21.59	27.32				17.55	5
038/Nore				18.83						18.83	1
050/Mahon		2.11						10.72	3.92	5.58	3
051/Tay					8.75				3.07	5.91	2
053/Colligan					29.32			9.50		19.41	2

Table A.3.1.1: Catchment-wide Electrofishing data for SERBD 2007- 2015 showing the average salmon fry captured/5min for each year surveyed. Also shown is the Surveys Mean capture rate.

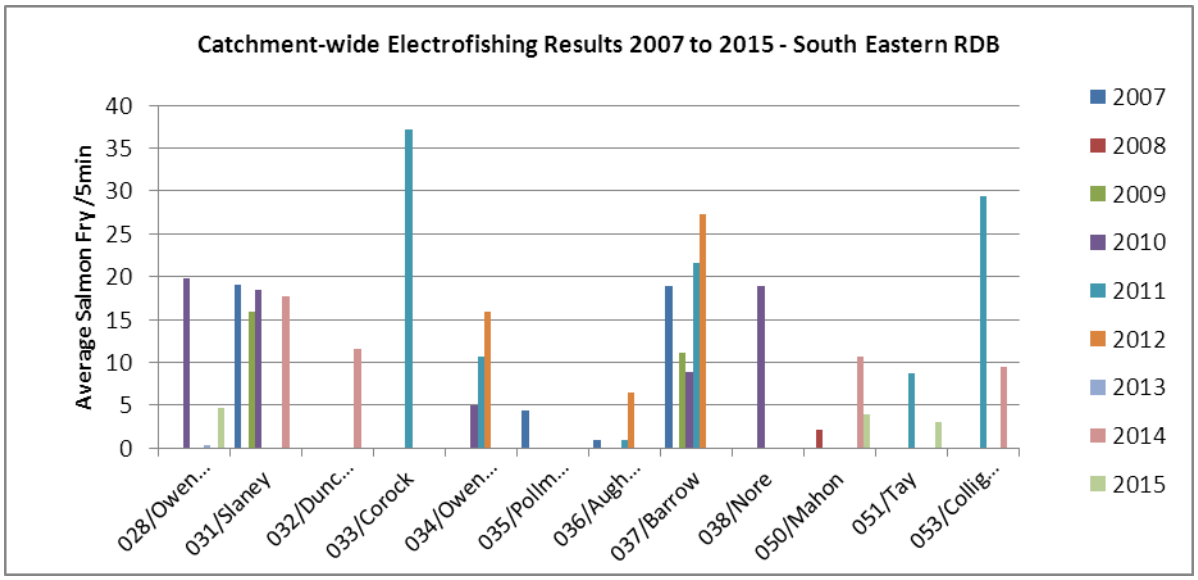


Figure A.3.1.1: Summary of CWEF results in SERBD from 2007 to 2015.

A.3.2 The Owenavorragh River

IFI Salmon Catchment #: 28
2015 survey dates: 18/8/2015 - 04/9/2015
Mean Salmon Fry/5 min (2015): 4.61 fry/5min.
CWEF Index: 8.23 fry/5min.

Sampling carried out by:

Myles Roban
Morgan Rowsome
Michael Farnan
Ken Whelan??

Fish Species Present:

Brown Trout
European eel
Flounder
Gudgeon
Lamprey sp.
Minnow
Salmon
Stone loach
Three-spined stickleback

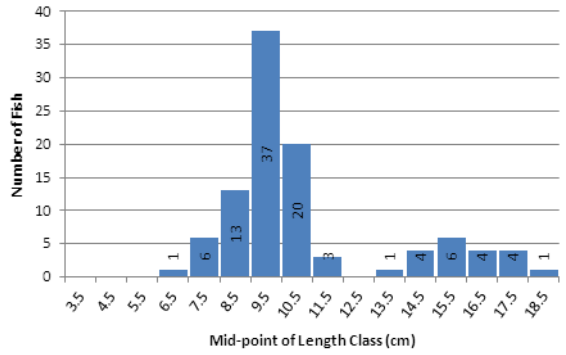


Figure A.3.2.1: Length distribution of salmon captured in 2015 CWEF survey on the Owenavorragh Catchment.

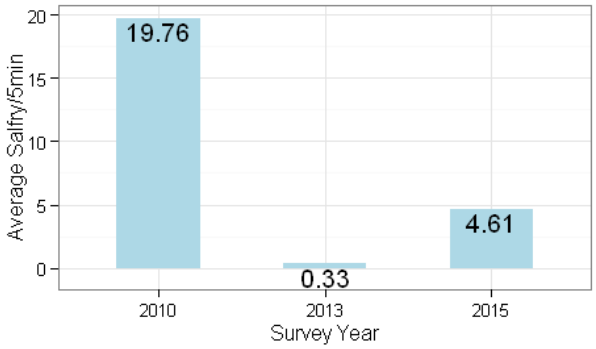


Figure A.3.2.2: Comparison of mean salfry/5 min for all surveys on the Owenavorragh catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2010	7					13.52
2013	6					15.78
2015	18					5.26

Table A.3.2.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	810	-411	Closed	19.76	
2010	2011	810	-411	Closed		
2011	2012	810	-411	Closed		
2012	2013	810	-411	Closed	0.33	
2013	2014	944	-715	Closed		
2014	2015	945	-713	Closed	4.61	8.23

Table A.3.3.2: Conservation limits and provisional returns on the Owenavorragh catchment along with the 2015 CWEF fishing result.

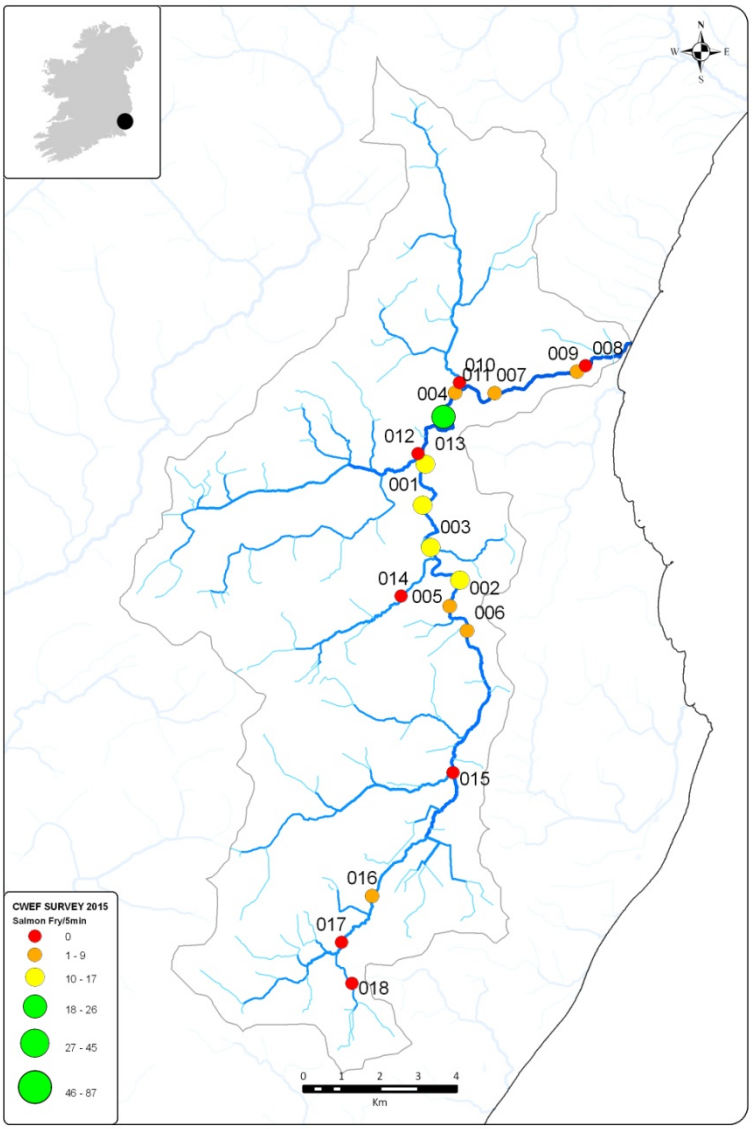
This survey, the third of this catchment in the 2007 to 2015 period, was carried out during August and September 2015. The survey comprised 18 sites, all of which were included in the analysis giving coverage of 15.78 km per survey site. Salmon fry were present at 11 sites. The maximum fry catch was 16 salmon at site 4. The mean catch of included sites was 4.61 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was very large at 9.5cm.

Conclusion

The Owenavorragh had a mean catch of 4.61 salfry/5min in 2015 resulting in a combined annual average of 8.23 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	314999	153140	4	1	10	Include	10
2	315971	151179	4		10	Include	10
3	315211	152033	4	1	10	Include	11.67
4	315538	155452	5	1	16	Include	18.18
5	315710	150499	4	3	5	Include	5
6	316165	149855	4	2	1	Include	1
7	316887	156062	5	1	5	Include	5
8	319253	156785	5	2	0	Include	0
9	319027	156622	5	1	1	Include	1
10	315957	156340	3	1	0	Include	0
11	315853	156076	5	2	5	Include	5
12	314883	154489	4	1	0	Include	0
13	315067	154205	4	1	12	Include	14
14	314433	150767	3	1	0	Include	0
15	315787	146160	4		0	Include	0
16	313686	142929	3	2	2	Include	2.18
17	312884	141733	3	3	0	Include	0
18	313150	140659	2	2	0	Include	0

Table A.3.2.3: Site specific results of CWEF on the Owenavorragh catchment in 2015.



Map A.3.2.1: CWEF survey site locations of 2015 on the Owenavorragh River.

A.3.3 The Mahon River

IFI Salmon Catchment #: 50
2015 survey dates: 24/9/2015 - 25/9/2015
Mean Salmon Fry/5 min (2015): 3.92 fry/5min.
CWEF Index: 5.58 fry/5min.

Sampling carried out by:

Noel Power
Micheal Byron

Fish Species Present:

Brown Trout
European eel
Salmon

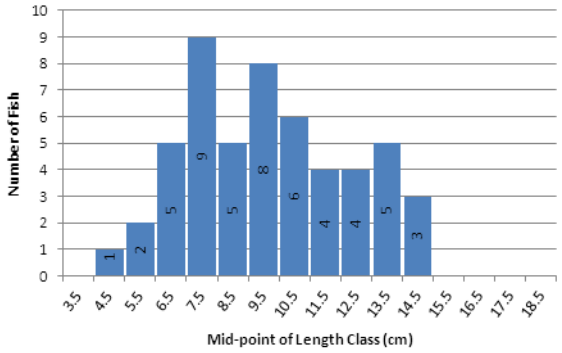


Figure A.3.3.1: Length distribution of salmon captured in 2015 CWEF survey on the Mahon Catchment.

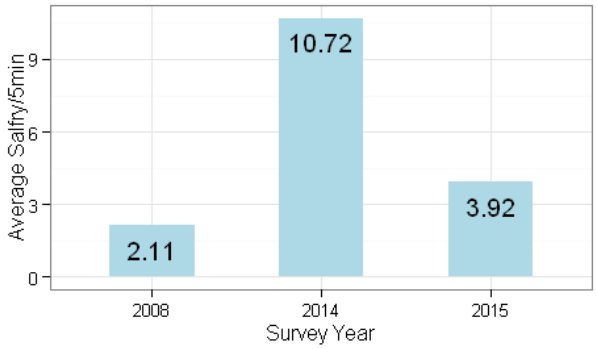


Figure A.3.3.2: Comparison of mean salfry/5 min for all surveys on the Mahon catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2008	9	1				6.41
2014	8					8.01
2015	7	1				8.01

Table A.3.3.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	442	-389	Closed		
2010	2011	442	-388	Closed		
2011	2012	442	-388	Closed		
2012	2013	442	-388	Closed		
2013	2014	442	-303	Closed	10.72	
2014	2015	442	-302	Closed	3.92	5.58

Table A.3.3.2: Conservation limits and provisional returns on the Mahon catchment along with the 2015 CWEF fishing result.

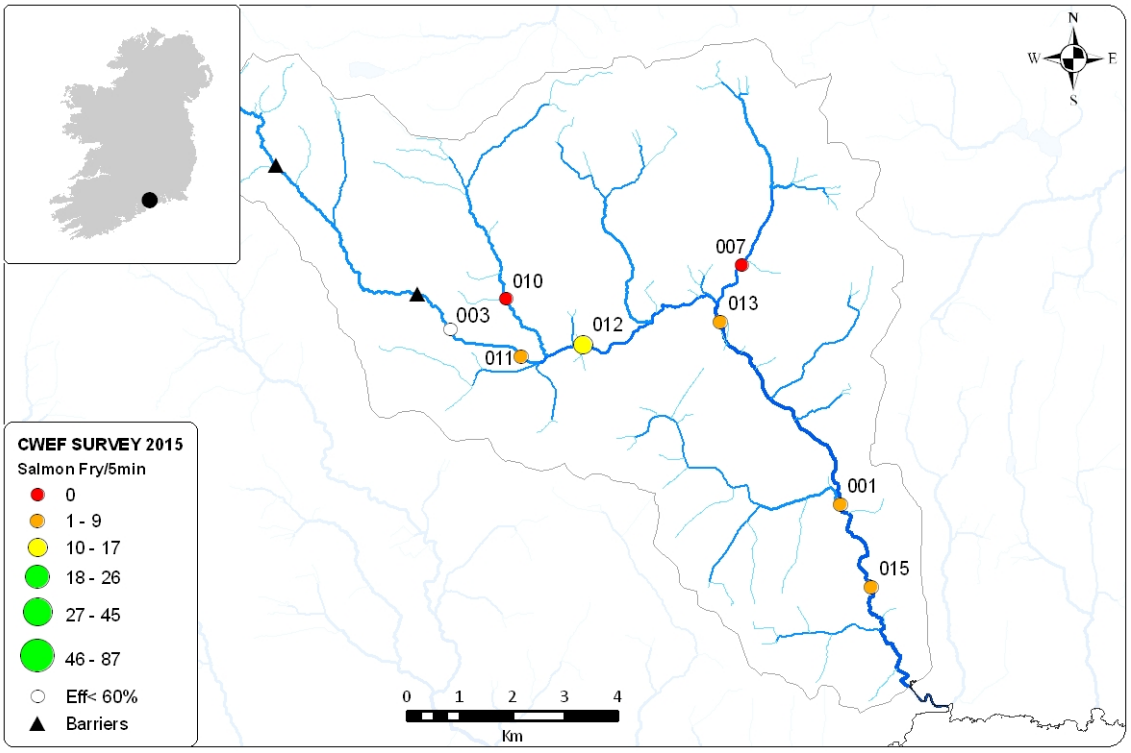
This survey, the third of this catchment in the 2007 to 2015 period, was carried out during September 2015. The survey comprised 8 sites, 7 of which were included in the analysis giving a good coverage of 8km per survey site. Salmon fry were present at 6 sites. The maximum fry catch was 7 salmon at site 12. The mean catch of included sites was 3.92 salmon fry/5min. The modal length category of 0+ fry caught was 7.5cm.

Conclusion

The Mahon had a mean catch of 3.92 salfry/5min in 2015 resulting in a combined annual average of 5.58 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	241687	102654	5	1	4	Include	6
3	234254	105999	3	2	1	Efficiency below 60%	
7	239812	107223	4	2	0	Include	0
10	235322	106573	3	2	0	Include	0
11	235614	105482	3	1	3	Include	3.82
12	236786	105692	4	1	7	Include	9.1
13	239411	106136	5	3	5	Include	6.11
15	242278	101092	5	1	2	Include	2.4

Table A.3.3.3: Site specific results of CWEF on the Mahon catchment in 2015.



Map A.3.3.1: CWEF survey site locations 2015 on the Mahon River.

A.3.4 The Tay River

IFI Salmon Catchment #: 51
2015 survey dates: 28/9/2015 - 29/9/2015
Mean Salmon Fry/5 min (2015): 3.07 fry/5min.
CWEF Index: 5.91 fry/5min.

Sampling carried out by:

Noel Power
Michael Byron
John Flynn??

Fish Species Present:

Brown Trout
Salmon

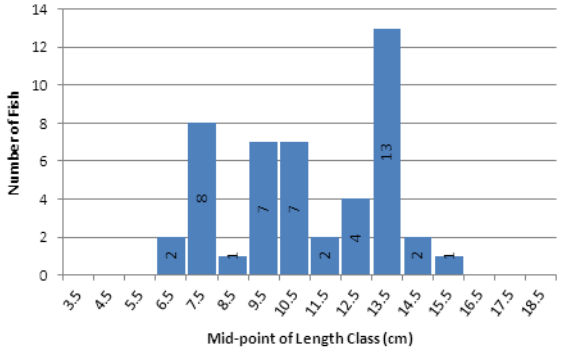


Figure A.3.4.1: Length distribution of salmon captured in 2015 CWEF survey on the Tay Catchment.

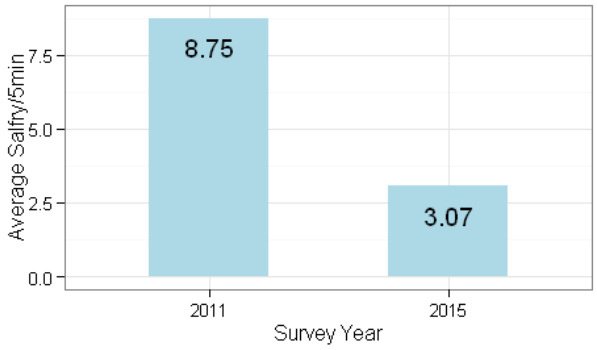


Figure A.3.4.2: Comparison of mean salfry/5 min for all surveys on the Tay catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2011	6					6.85
2015	4	1				8.22

Table A.3.4.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	278	-153	Closed		
2010	2011	278	-153	Closed	8.75	
2011	2012	278	-153	Closed		
2012	2013	278	-153	Closed		
2013	2014	318	-223	Closed		
2014	2015	319	-223	Closed	3.07	5.91

Table A.3.4.2: Conservation limits and provisional returns on the Tay catchment along with the 2015 CWEF fishing result.

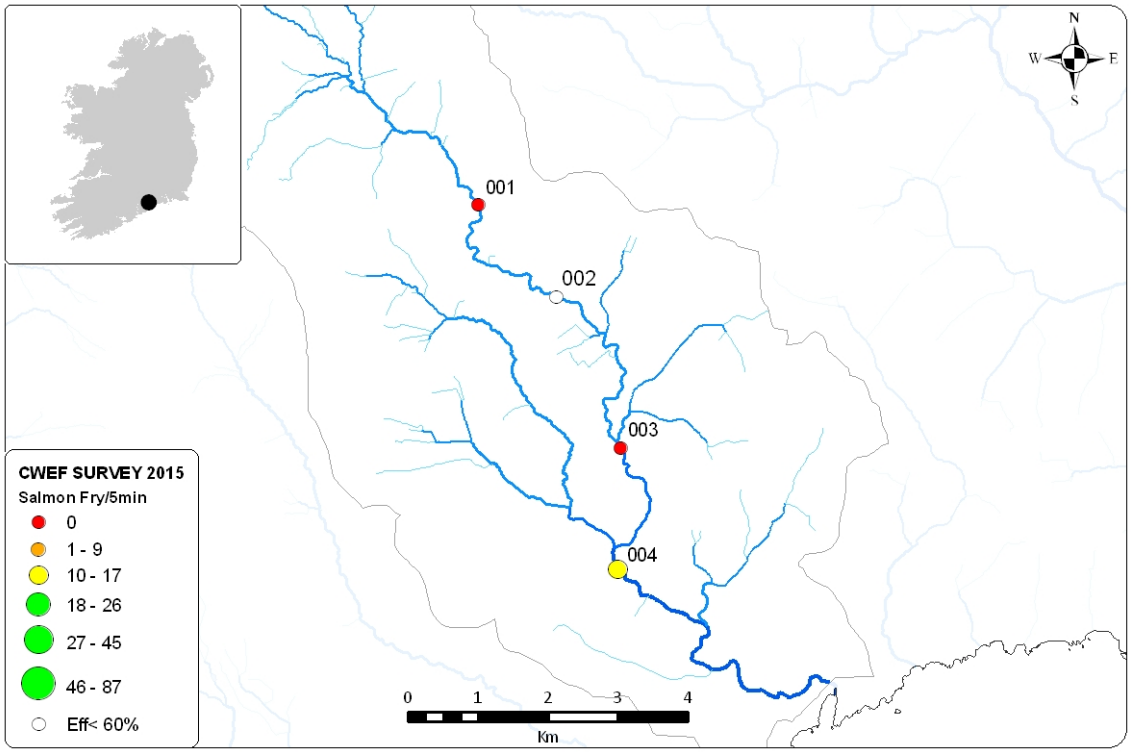
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during September 2015. The survey comprised 5 sites, four of which were included in the analysis giving a coverage of 8.22 km per survey site. Salmon fry were present at 2 sites. The maximum fry catch was 3 salmon at site 4.The mean catch of included sites was 9.5 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of fry caught was 7.5cm.

Conclusion

The Tay had a mean catch of 3.07salfry/5min in 2015 resulting in a combined annual average of 5.91 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	231980	103959	3	1	0	Include	0
2	233087	102640	3	1	4	Efficiency below 60%	
3	234019	100477	4	1	0	Include	0
4	233968	98740	5	2	7	Include	10.89
5	234733	98155	5	2	1	Include	1.4

Table A.3.4.3: Site specific results of CWEF on the Tay catchment in 2015.



Map A.3.4.1: CWEF survey site locations of 2015 on the Tay River.

A.4 South Western River Basin District

A.4.1 Summary

Since 2007, thirty two rivers have been surveyed in the South-Western River Basin District (SWRBD) as part of the on-going catchment-wide electrofishing surveys. These are presented in Table A.4.1.1. Eleven rivers currently have a survey average salmon fry capture rate of greater than 17 fry per 5min. Six catchments: the Lickey, Kealincha, Lough Fada, Owenshagh Emlaghmore and the Milltown, were surveyed in 2015. Low salmon fry abundance on the Miltown have resulted in this system being under the 17 salfry/5min threshold.

	Survey Year									Current Index	# of Annual Surveys Considered
IFI Code/ River	2007	2008	2009	2010	2011	2012	2013	2014	2015		
055/Lickey		12.37							14.14	13.26	2
057/Finisk		10.55								10.55	1
058/Glenshelane	22.72	10.96								16.84	2
060/Bride		10.40		24.70				19.85		18.32	3
061/Tourig						9.40				9.40	1
062/Womanagh		15.45						2.39		8.92	2
064/Owennacurra	15.76									15.76	1
066/Lower Lee (Cork)			0.26							0.26	1
070/Argideen	17.15									17.15	1
077/Mealagh						12.82				12.82	1
080/Glengarriff			5.93							5.93	1
081/Adrigole							4.01	1.33		2.67	2
082/Kealincha	0.00								0.00	0.00	2
083/Lough Fada	3.23								1.68	2.45	2
085/Owenshagh							4.32		6.73	5.53	2
086/Cloonee						16.18	33.06			24.62	2
088/Roughty					19.78					19.78	1
089/Finnihy						8.61	0.00			4.31	2
090/Blackwater (Kerry)	30.54	15.52	13.35					17.82		19.31	4
093/Owreagh	8.94						2.07	2.81		4.61	3
097/Currane								24.51		24.51	1
098/Inny	24.63		19.78							22.20	2
099/Emlaghmore	2.07								1.45	1.76	2
101/Carhan	15.76						6.05	8.61		10.14	3
102/Ferta	19.42							10.90		15.16	2
103/Behy	15.41	6.14	4.03	8.71	7.17					8.29	5
105/Cotteners		17.42								17.42	1
107/Maine	31.88	32.81	34.23							32.97	3
108/Emlagh	10.37	3.66	13.38	3.84	2.59					6.77	5
109/Owenascaul	20.41		22.27				16.08	16.28		18.76	4
110/Owenalondrig			21.90							21.90	1
111/Milltown (Kerry)		15.33		26.44			13.02		8.76	15.89	4

Table A.4.1.1: Catchment-wide Electrofishing data for SWRBD 2007- 2015 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

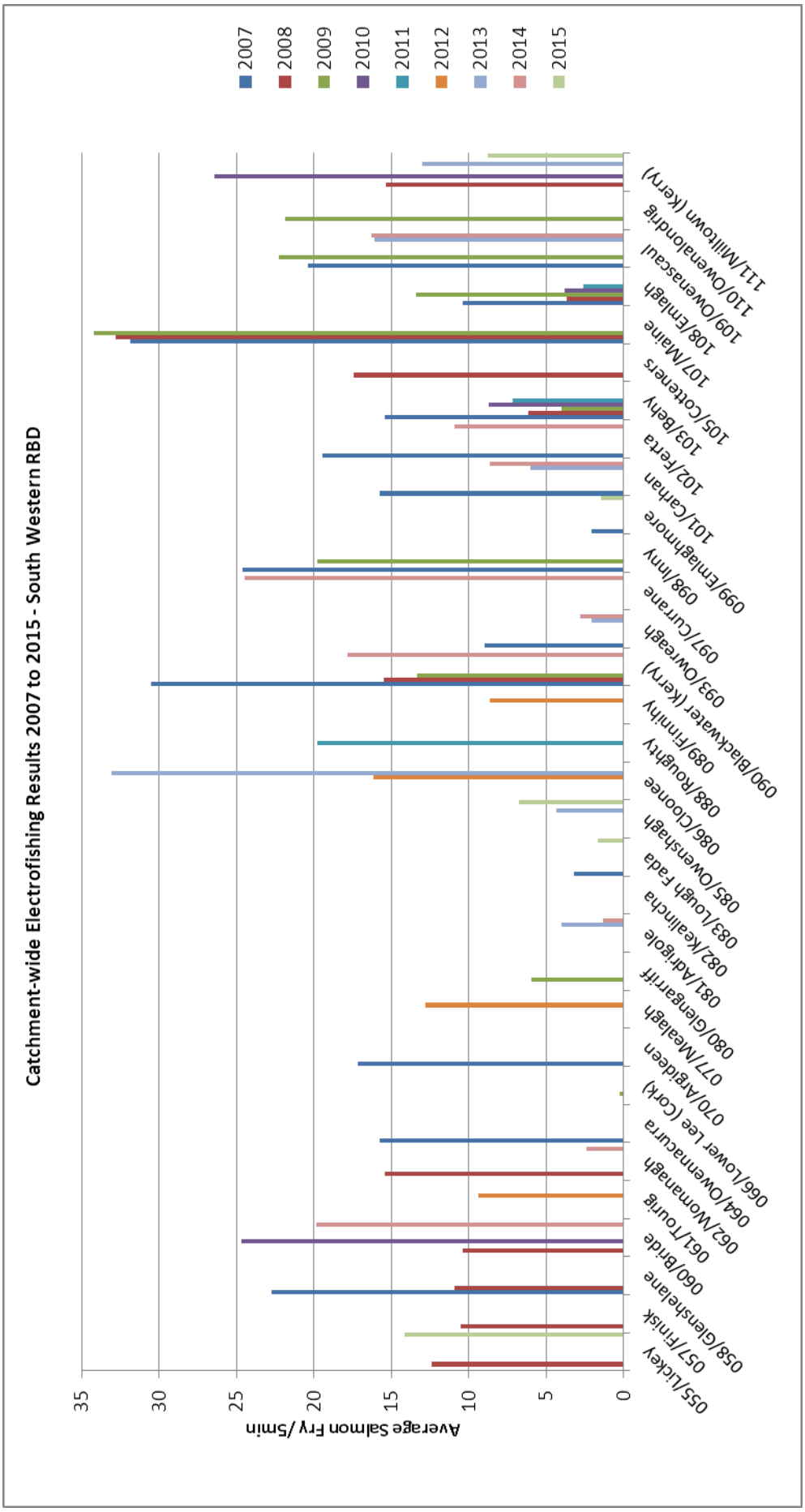


Figure A.4.1.1. Summary of CWEF results in SWRBD from 2007 to 2015

A.4.2 The Lickey River

IFI Salmon Catchment #: 55
2015 survey dates: 19/8/2015 - 19/8/2015
Mean Salmon Fry/5 min (2015): 14.14 fry/5min.
CWEF Index: 13.26 fry/5min.

Sampling carried out by:

Mick Mullane
Tony Holmes

Fish Species Present:

Brown Trout
European eel
Flounder
Salmon

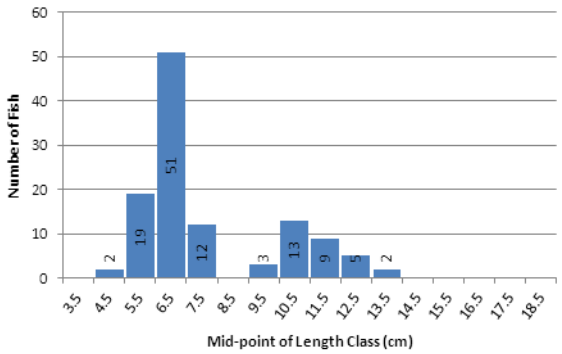


Figure A.4.2.1: Length distribution of salmon captured in 2015 CWEF survey on the Lickey Catchment.

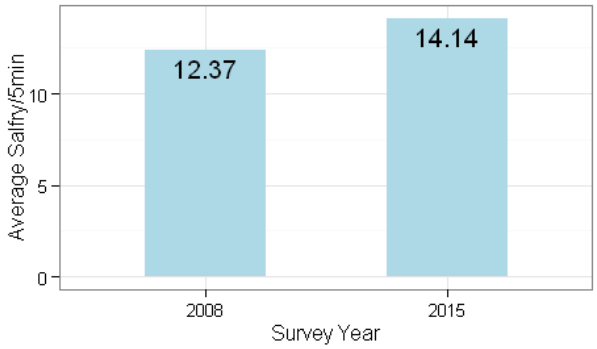


Figure A.4.2.2: Comparison of mean salfry/5 min for all surveys on the Lickey catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2008	3		1			4.92
2015	8		1			2.19

Table A.4.2.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	114	-70	Closed		
2010	2011	114	-70	Closed		
2011	2012	114	-70	Closed		
2012	2013	114	-70	Closed		
2013	2014	147	-111	Closed		
2014	2015	147	-112	Closed	14.14	13.26

Table A.4.2.2: Conservation limits and provisional returns on the Lickey catchment along with the 2015 CWEF fishing result.

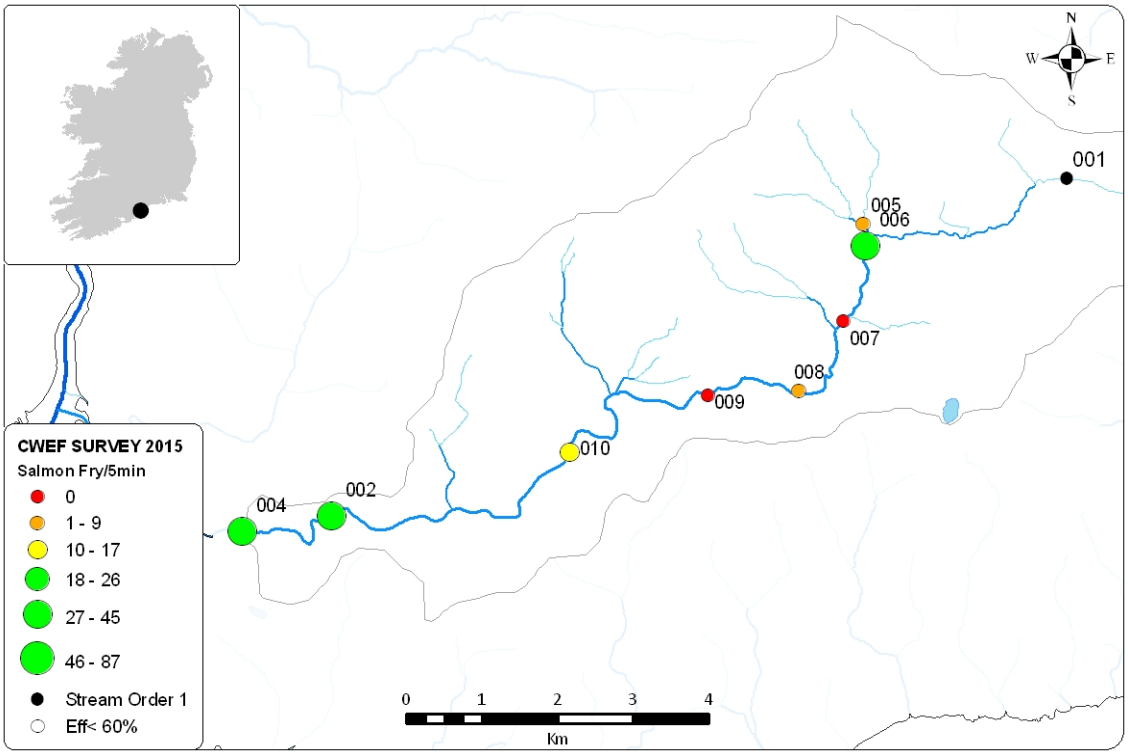
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during August 2015. The survey comprised 9 sites, 8 of which were included in the analysis giving a good coverage of 2.19km per survey site. Salmon fry were present at 6 sites. The maximum fry catch was 29 salmon at site 2. The mean catch of included sites was 14.14 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 6.5cm.

Conclusion

The Lickey had a mean catch of 14.14 salfry/5min in 2015 resulting in a combined annual average of 13.26 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	223307	87474	1	2	0	Stream order<2	
2	213570	83023	3	1	29	Include	38.67
4	212388	82822	3	1	20	Include	26.09
5	220618	86877	2	1	1	Include	1.13
6	220638	86583	3	2	16	Include	26.32
7	220353	85589	3	2	0	Include	0
8	219770	84669	3	2	4	Include	4.89
9	218555	84612	3	3	0	Include	0
10	216730	83861	3	2	14	Include	16

Table A.4.2.3: Site specific results of CWEF on the Lickey catchment in 2015.



Map A.4.2.1: CWEF survey site locations 2015 for the Lickey River.

A.4.3 The Kealincha River

IFI Salmon Catchment #: 82
2015 survey date: 18/8/2015
Mean Salmon Fry/5 min (2015): 0 fry/5min.
CWEF Index: 0 fry/5min.

Sampling carried out by:

Mick Mullane
Tony Holmes

Fish Species Present:

Brown Trout
European Eel
Flounder

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2007	3	0	0	0	0	7.9
2015	5	0	0	0	0	4.8

Table A.4.3.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2008	2009	123	19	Catch and Release		
2009	2010	123	19	Catch and Release		
2010	2011	123	19	Catch and Release		
2011	2012	123	19	Catch and Release		
2012	2013	123	19	Catch and Release		
2013	2014	128	-2	Catch and Release		
2014	2015	128	-2	Catch and Release	0	0.00

Table A.4.3.2: Conservation limits and provisional returns on the Kealincha catchment along with the 2015 CWEF fishing result.

This survey, the second of this catchment in the 2007 to 2015 period, was carried out during August 2015. The survey comprised 5 sites, all of which were included in the analysis giving a good coverage of 4.8km per survey site. Salmon (fry and parr) were absent from all 5 sites. The uppermost site was just below a waterfall, it is not expected that salmon would be capable of traversing these falls.

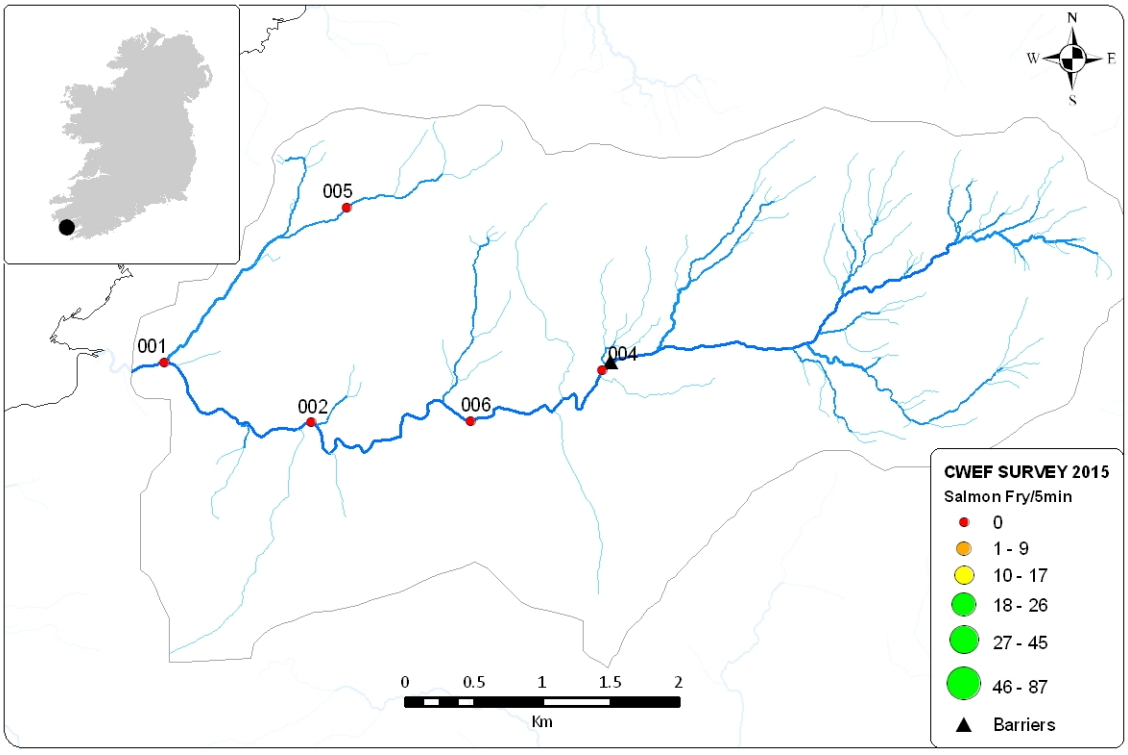
This is a small catchment, with an area of just over 20km^2, and a fluvial area of 7.3 ha (McGinnity et al. 2012), when the presence of an impassable waterfall is taken into account the accessible wetted area is reduced to around 4.6 ha, comprising about 0.03% of the national salmonid riverine habitat. Water quality was last assessed by the EPA at one site, located low down on the main on this river in 2012. The Q value was 4, (on a scale of 1-grossly polluted to 5-pristine unpolluted) indicating good water quality. Previous water quality surveys in 1997, 2000, 2003, 2006 and 2009 have indicated consistently good water quality at this and other sites.

Conclusion

The Kealincha was closed to angling in 2015. The CWEF survey of the catchment found no salmon whatsoever. The previous survey in 2007 found only 3 salmon parr, at one (site 1) of three sites surveyed.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
001	64319.511	50089.942	4	3	0	Include	0
002	65388.9	49650.492	4	1	0	Include	0
004	67519.019	50035.985	4	2	0	Include	0
005	65648.535	51218.484	2	1	0	Include	0
006	66555.005	49663.278	4	2	0	Include	0

Table A.4.3.3: Site specific results of CWEF on the Kealincha catchment in 2015.



Map A.4.3.1: CWEF survey site locations 2015 on the Kealincha catchment.

A.4.4 Lough Fada

IFI Salmon Catchment #: 83
2015 survey dates: 18/8/2015
Mean Salmon Fry/5 min (2015): 1.68 fry/5min.
CWEF Index: 2.45 fry/5min.

Sampling carried out by:

Mick Mullane
Tony Holmes

Species Present:

Brown Trout
European Eel
Salmon

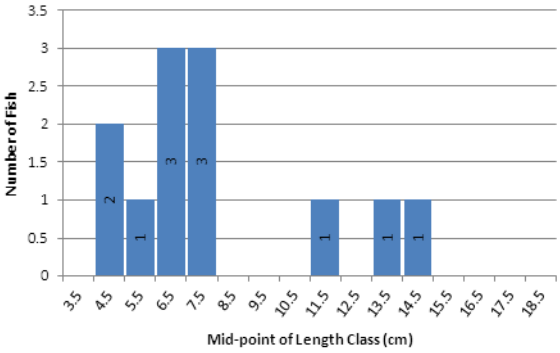


Figure A.4.4.1: Length distribution of Salmon captured in 2015 CWEF Survey on the Lough Fada Catchment.

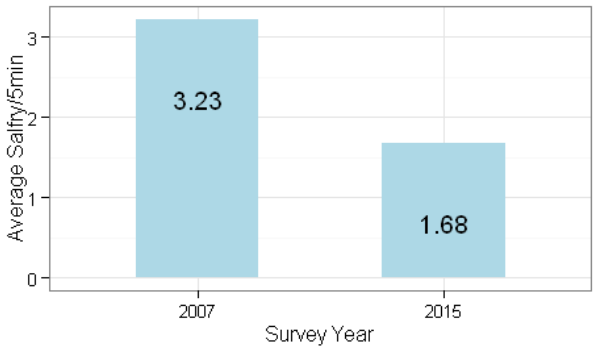


Figure A.4.4.2: Comparison of mean salfry/5 min for all surveys on the Lough Fada catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2007	4					5.15
2015	6					4.30

Table A.4.4.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2008	2009	90	13	Closed		
2009	2010	90	13	Closed		
2010	2011	90	13	Closed		
2011	2012	90	13	Closed		
2012	2013	90	13	Closed		
2013	2014	88	3	Closed		
2014	2015	87	3	Closed	1.68	1.68

Table A.4.4.2: Conservation limits and provisional returns on the Lough Fada catchment along with the 2015 CWEF fishing result.

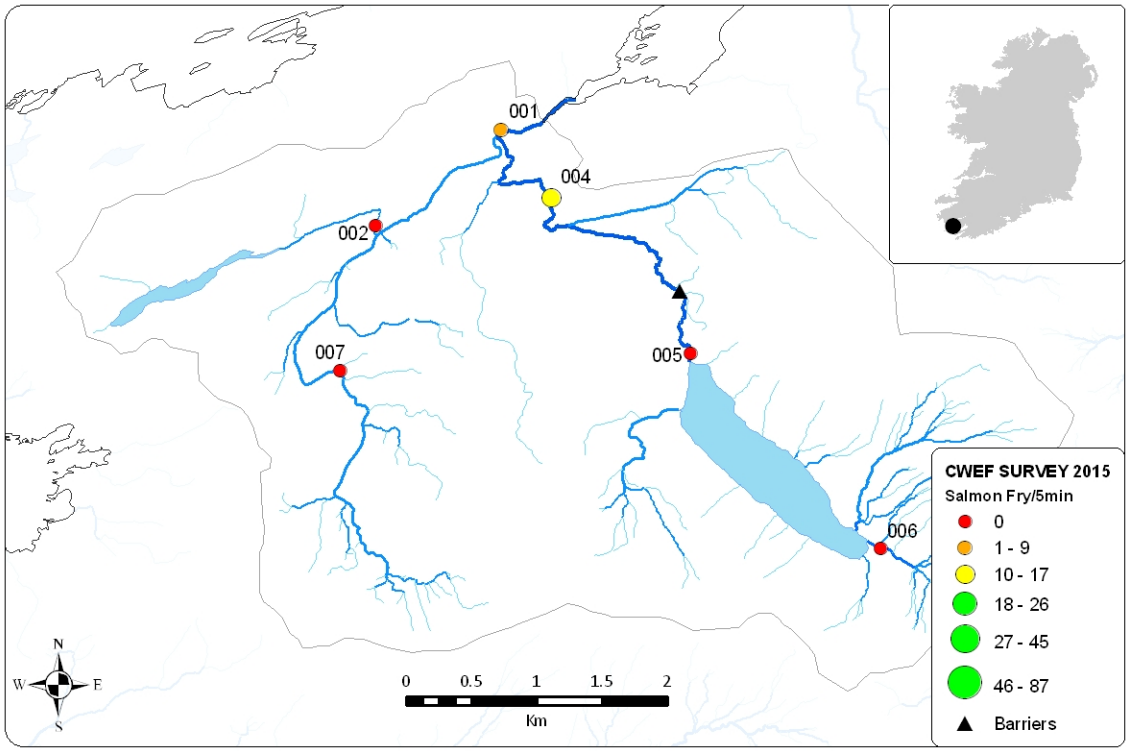
This is the second CWEF survey on this catchment; the first took place in 2007 and returned an average of 3.23 salmon fry/5min, salmon fry being present at three of the four sites surveyed. The 2015 survey found salmon fry at only two sites and in smaller number than the previous survey. Salmon parr were found at site 5 below Glenbeg lough, which indicates that the barriers below that point are passable to salmon. A survey at site 6, above the lough, found exceptionally high numbers of small trout fry, but no identifiable salmon fry. Site 7 at Barrees Bridge had eminently suitable salmon habitat but no salmon fry.

Conclusion

The Lough Fada catchment in 2015 had a mean catch of 1.68 salfry/5min resulting in a combined annualof 2.45 salmon fry/5min; this is well below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	68631	55591	5	2	1	Include	1
2	67662	54852	2	1	0	Include	0
4	69014	55065	5	2	8	Include	9.07
5	70079	53869	5	2	0	Include	0
6	71542	52371	4	1	0	Include	0
7	67390	53739	3	1	0	Include	0

Table A.4.4.3: Site specific results of CWEF on the Lough Fada catchment in 2015.



Map A.4.4.1: CWEF survey site locations 2015 on the Lough Fada catchment.

A.4.5 The Owenshagh River

IFI Salmon Catchment #: 85
2015 survey date: 14/8/2015
Mean Salmon Fry/5 min (2015): 6.73 fry/5min.
CWEF Index: 5.53 fry/5min.

Sampling carried out by:

Mick Mullane
Tony Holmes

Fish Species Present:

Brown Trout
European Eel
Salmon.

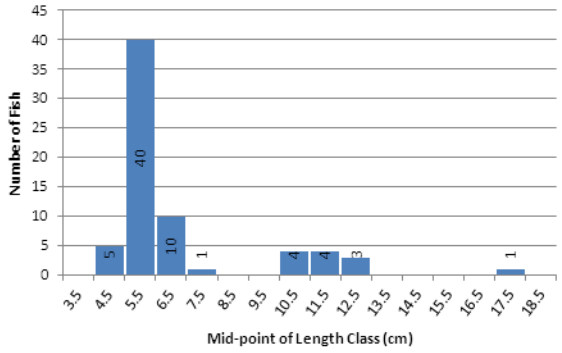


Figure A.4.5.1: Length distribution of Salmon captured in 2015 WEF Survey on the Owenshagh Catchment.

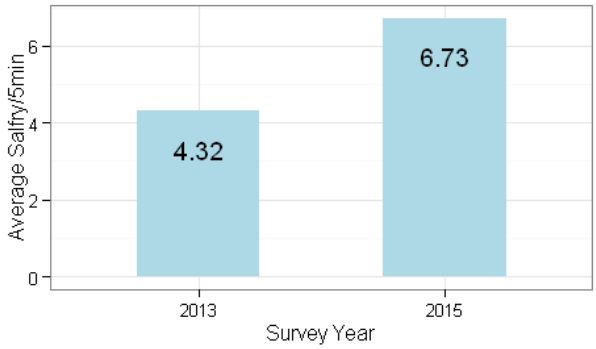


Figure A.4.5.2: Comparison of mean salfry/5 min for all surveys on the Owenshagh catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2013	11			5		4.8
2015	10					5.3

Table A.4.5.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2008	2009	323	-178	Closed		
2009	2010	323	-185	Closed		
2010	2011	323	-185	Closed		
2011	2012	323	-185	Closed		
2012	2013	323	-185	Closed	4.3	
2013	2014	302	-211	Closed		
2014	2015	304	-212	Closed	6.7	5.5

Table A.4.5.2: Conservation limits and provisional returns on the Owenshagh catchment along with the 2015 CWEF fishing result.

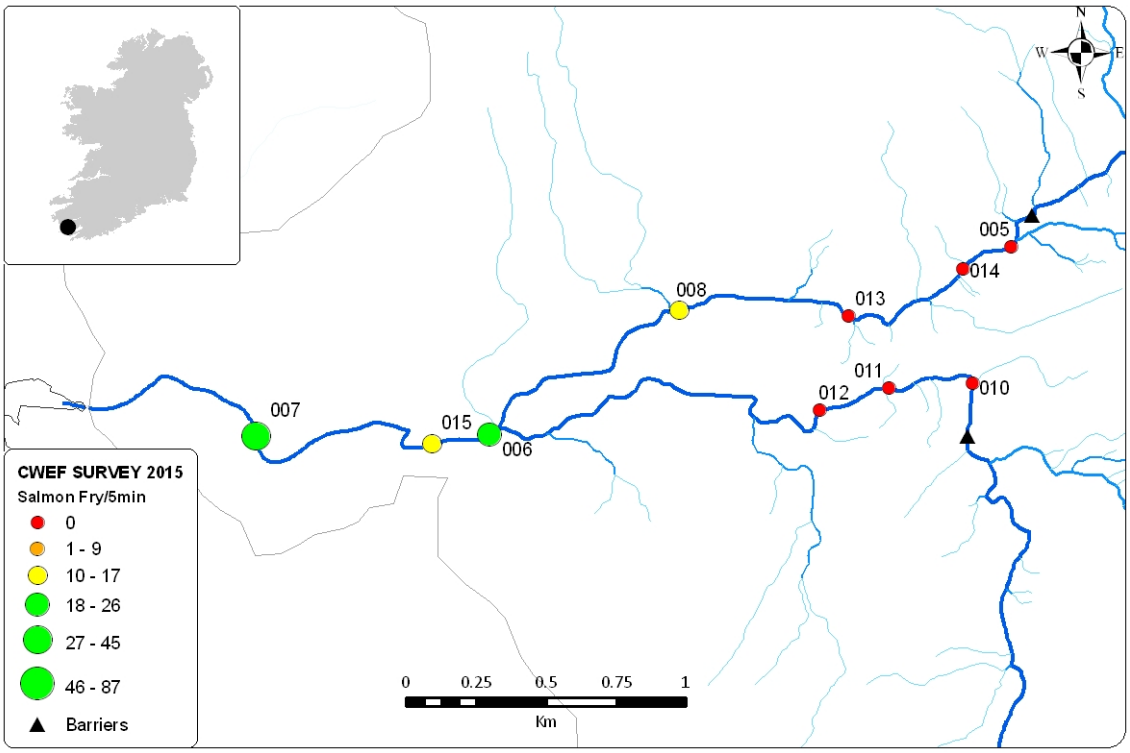
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during August 2015. The survey comprised 10 sites, all of which were included in the analysis giving a good coverage of 5.3km per site. Salmon fry were present at only 4 sites. The maximum fry catch was 21 salmon fry at site 7. The mean catch of included sites was 2.81 salmon fry/5min. Three cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 5.5cm. Salmon were absent from the uppermost three sites on each of the main tributaries, the rivers in this areas are characterised by numerous cascades and small falls which may hinder the progress of adult salmon.

Conclusion

The Owenshagh had a mean catch of 6.73 salfry/5min in 2015 resulting in a combined annual average of 5.53 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
5	80786	59017	5	1	0	Include	0
6	78924	58349	6	1	17	Include	19.55
7	78089	58342	6	1	21	Include	26.88
8	79601	58790	5	1	9	Include	9.64
10	80648	58529	5	1	0	Include	0
11	80349	58511	5	2	0	Include	0
12	80103	58432	5	2	0	Include	0
13	80205	58769	5	2	0	Include	0
14	80616	58937	5	1	0	Include	0
15	78719	58313	6	1	9	Include	11.25

Table A.4.5.3: Site specific results of CWEF on the Owenshagh catchment in 2015.



Map A.4.5.1: CWEF survey site locations 2015 on the Owenshagh River.

A.4.6 The Emlaghmore River

IFI Salmon Catchment #: 99
2015 survey dates: 17/08/2015
Mean Salmon Fry/5 min (2015): 1.45 fry/5min.
CWEF Index: 1.76 fry/5min.

Sampling carried out by:

Mick Mullane
Tony Holmes

Fish Species Present:

Brown Trout
European Eel
Salmon

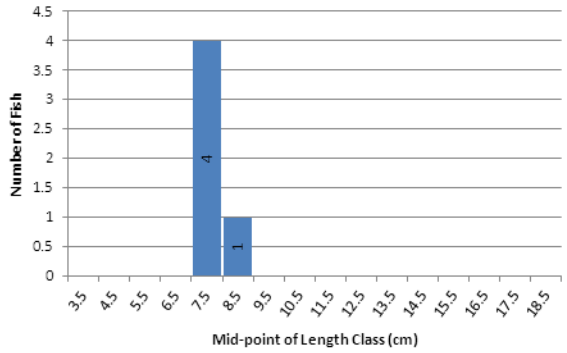


Figure A.4.6.1: Length distribution of salmon captured in 2015 CWEF Survey on the Emlaghmore Catchment.

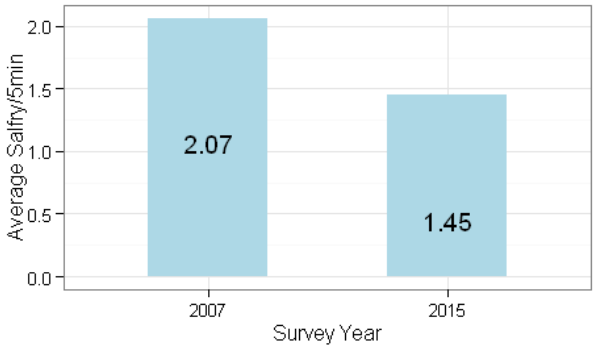


Figure A.4.6.2: Comparison of Mean Salfry/5min for all surveys on the Emlaghmore catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2007	3	1	1			3.7
2015	4					3.7

Table A.4.6.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2007	2008	73	-29	Closed		
2008	2009	73	-29	Closed		
2009	2010	73	-33	Closed		
2010	2011	73	-33	Closed		
2011	2012	73	-33	Closed		
2012	2013	73	-33	Closed		
2013	2014	68	-39	Closed		
2014	2015	67	-39	Closed	1.4	1.4

Table A.4.6.2: Conservation limits and provisional returns on the Emlaghmore catchment along with the 2015 CWEF fishing result.

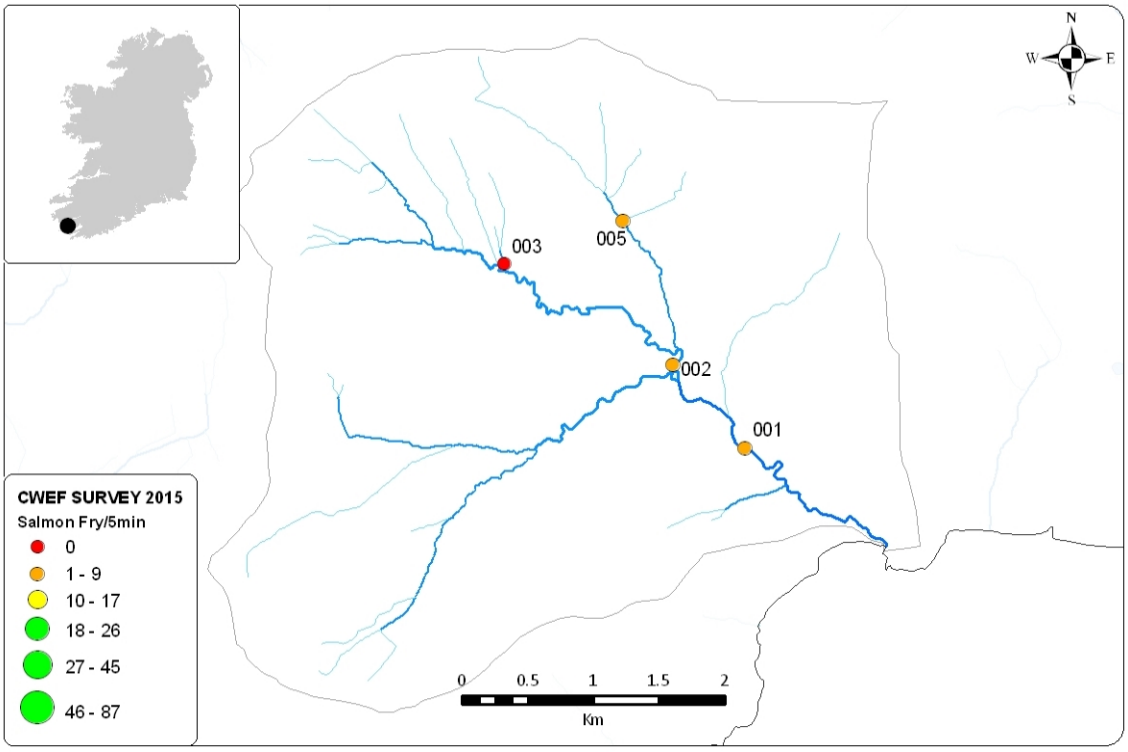
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during August 2015. The survey comprised 4 sites, all of which were included in the analysis giving coverage of 2.7 km per survey site. Salmon fry were present at 3 sites. The maximum fry catch was 3 salmon at site 1 on the lower main channel. The mean catch of included sites was just 1.45 salmon fry/5min. The salmon fry captured were relatively large; the modal length category of 0+ fry caught was 7.5cm.

Conclusion

The Emlaghmore had a mean catch 1.45 salfry/5min in 2015 resulting in a combined annual average of 1.76 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	44567	68787	4	1	3	Include	3.43
2	44020	69419	3	1	1	Include	1.07
3	42732	70187	2	1	0	Include	0
5	43639	70517	2	1	1	Include	1.29

Table A.4.6.3: Site specific results of CWEF on the Emlaghmore catchment in 2015.



Map A.4.6.1: CWEF survey site locations 2015 on the Emlaghmore River.

A.4.7 The Milltown River (Kerry)

IFI Salmon Catchment #: 111
2015 survey date: 13/8/2015
Mean Salmon Fry/5 min (2015): 8.76 fry/5min.
CWEF Index: 15.89 fry/5min.

Sampling carried out by:

Mick Mullane
Tony Holmes

Fish Species Present:

Brown Trout
European Eel
Salmon

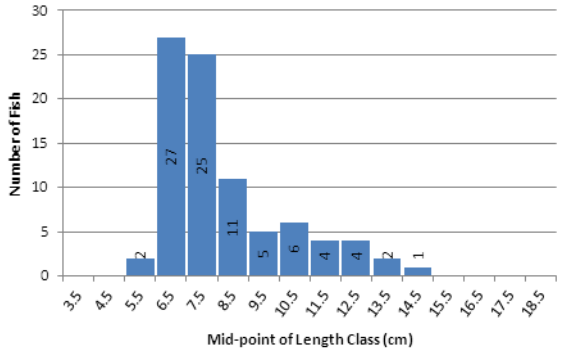


Figure A.4.7.1: Length distribution of salmon captured in 2015 CWEF survey on the Milltown Catchment.

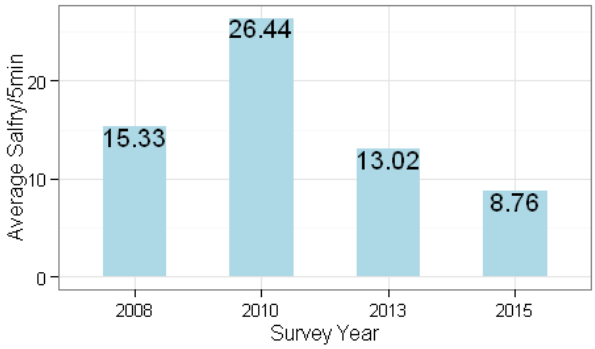


Figure A.4.7.2: Comparison of mean salfry/5 min for all surveys on the Milltown catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2008	5			1		3.3
2010	7	1				2
2013	8			1		2
2015	8					2

Table A.4.7.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2007	2008	82	-33	Catch and Release	15.3	
2008	2009	82	-33	Catch and Release		
2009	2010	82	-37	Catch and Release	26.4	
2010	2011	82	-37	Catch and Release		
2011	2012	82	-37	Catch and Release		
2012	2013	82	-37	Catch and Release	13.0	
2013	2014	87	-52	Catch and Release		
2014	2015	87	-52	Catch and Release	8.8	10.9

Table A.4.7.2: Conservation limits and provisional returns on the Milltown catchment along with the 2015 CWEF fishing result.

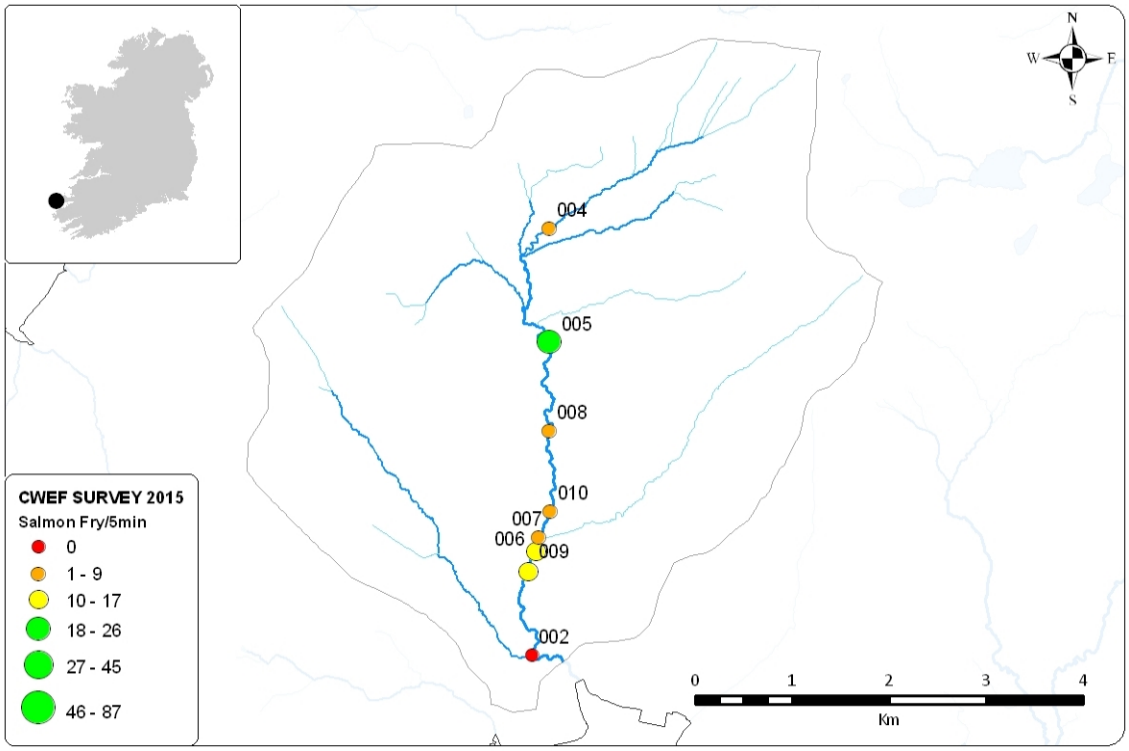
This survey, the fourth of this catchment in the 2007 to 2015 period, was carried out during August 2015. The survey comprised 8 sites, all of which were included in the analysis giving a good coverage of 2 km per survey site. Salmon fry were present at seven sites. The maximum fry catch was 16 salmon at site 5. The mean catch of included sites was 8.76 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 6.5cm.

Conclusion

The Milltown had a mean catch 8.76 salfry/5min in 2015 resulting in a combined annual average of 15.89 salmon fry/5min; this is now below the threshold of 17 salmon fry per 5 minutes and represents a change in its status compared to previous periods.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
2	42925	101570	2	1	0	Include	0
4	43103	105975	2	1	2	Include	2.24
5	43107	104801	3	1	16	Include	20.44
6	42963	102639	3	1	12	Include	14.57
7	42999	102786	3	2	5	Include	7.14
8	43106	103885	3	1	5	Include	7.14
9	42891	102424	3	1	8	Include	11.56
10	43114	103054	3	2	7	Include	7

Table A.4.7.3: Site specific results of CWEF on the Milltown catchment in 2015.



Map A.4.7.1: CWEF survey site locations 2015 on Milltown River.

A.5 Shannon River Basin District.

A.5.1 Summary

Since 2007, eighteen catchments or sub catchments have been surveyed in the Shannon River Basin District as part of the on-going catchment-wide electrofishing surveys. These are presented in table A.5.1.1. Only two rivers currently have a survey average salmon fry capture rate of greater than 17 fry per 5min, while thirteen fall below that level. Four catchments were surveyed in 2015: The Quin, Fergus, Skivaleen and Inagh; all were below the threshold of 17salfry/5min.

	Survey Year									Current Index	# of Annual Surveys Considered
IFI Code/ River	2007	2008	2009	2010	2011	2012	2013	2014	2015		
112/Feohanagh			16.61				3.20	12.09		10.64	3
114/Owenmore (Kerry)	25.07									25.07	1
117/Lee (Kerry)		0.67						0.68		0.67	2
118/Brick	0.00									0.00	1
119/Feale							24.15			24.15	1
120/Galey			12.99							12.99	1
125/Deel					0.14			0.18		0.16	2
126/Maigue			2.82	16.05			12.05			10.31	3
128/Shannon Kilcrow				0.69						0.69	1
128/Shannon Graney				0.19						0.19	1
128/Shannon Woodford				0.00						0.00	1
130/Owenagarney (Ratty)							16.97	9.97		13.47	2
130.1/Quin									7.48	7.48	1
131/Fergus	12.96		4.10	6.84			5.89		6.66	7.29	5
133/Doonbeg				12.91				18.54		15.72	2
134/Skivaleen					14.82				12.00	13.41	2
135/Annageeragh							1.82	9.24		5.53	2
142/Inagh								5.31	3.59	4.45	2

Table A.5.1.1. Catchment-wide Electrofishing data for SHRBD 2007-2015 and the average salmon fry captured /5min each year. Also shown is the CWEF Index.

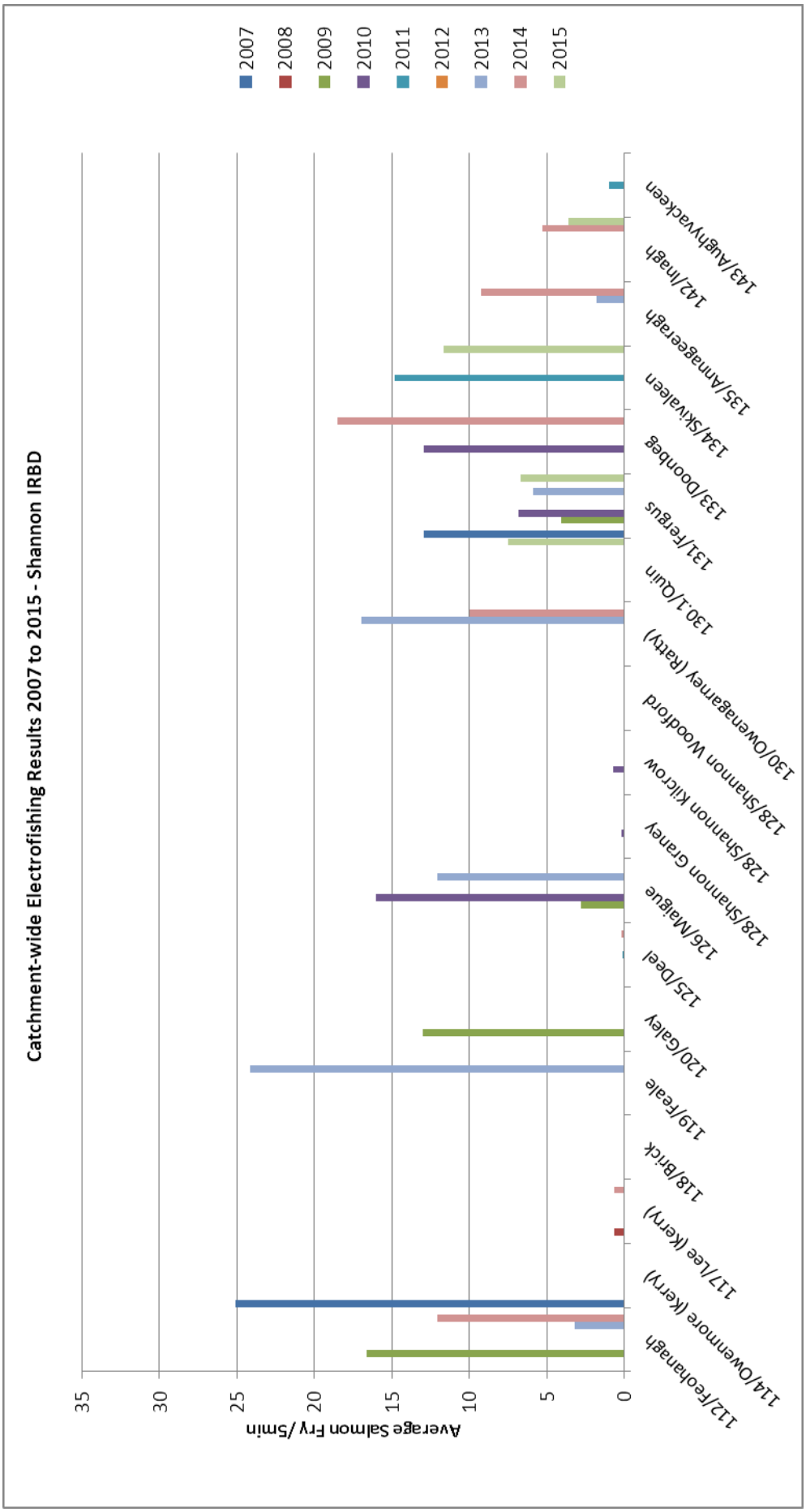


Figure A.5.1.1. Summary of CWEF results in SHRBD from 2007 to 2015.

A.5.1 Quin River

IFI Salmon Catchment #:
2015 survey dates: 29/8/2015-28/9/2015
Mean Salmon Fry/5 min (2015): 7.48 fry/5min.
CWEF Index: 7.48 fry/5min.

Sampling carried out by:

Ken O'Neil
Marcus McMahon
Ray Byrne

Fish Species Present:

Brown Trout
European Eel
Salmon

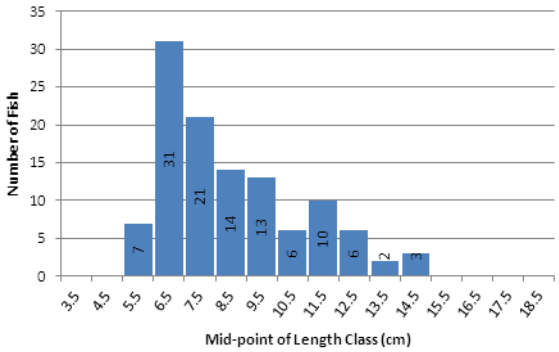


Figure A.5.1.1: Length distribution of salmon captured in 2015 CWEF survey on the Quin Catchment.

This is the only CWEF survey to date on this catchment; it was carried out in August and September 2015. The survey comprised 21 sites, 6 sites were deemed unsuitable and were not electrofished, 15 sites were surveyed 13 of which were included in the analysis. Salmon fry were present at 8 sites. The maximum fry catch was 17 salmon at site 26. The mean catch of included sites was 7.48 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 6.5cm.

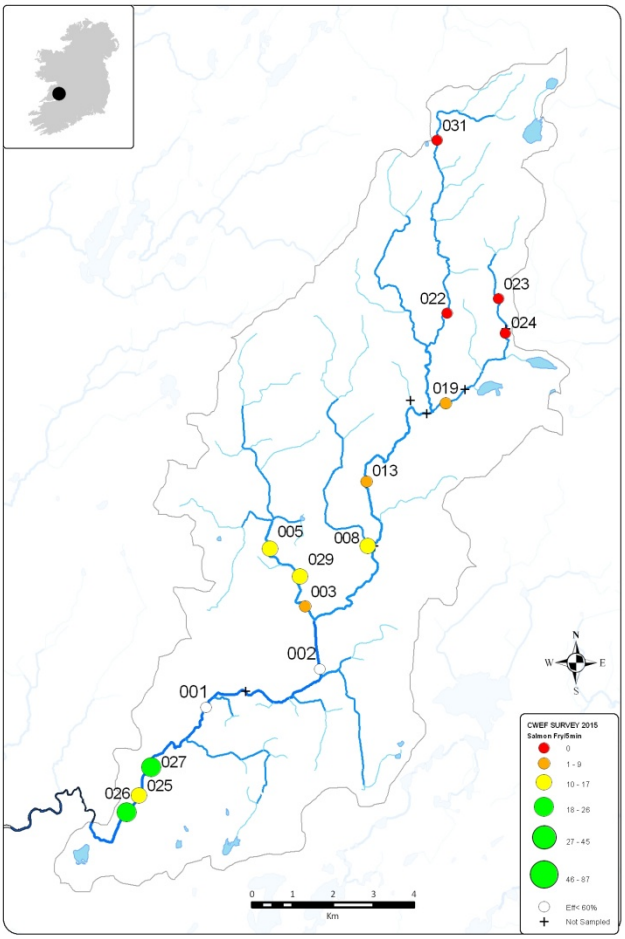
Conclusion

The Quin River (named as the River Rine on OS Discovery map) enters the sea within the Fergus estuary and is a separate entity. The wetted area report classifies it as being not considered a significant producer of salmonids (McGinnity et al 2003). The Quin River is not currently used in the estimation of the wetted area for the Fergus. It is not assessed by the SSCS and has no conservation limit.

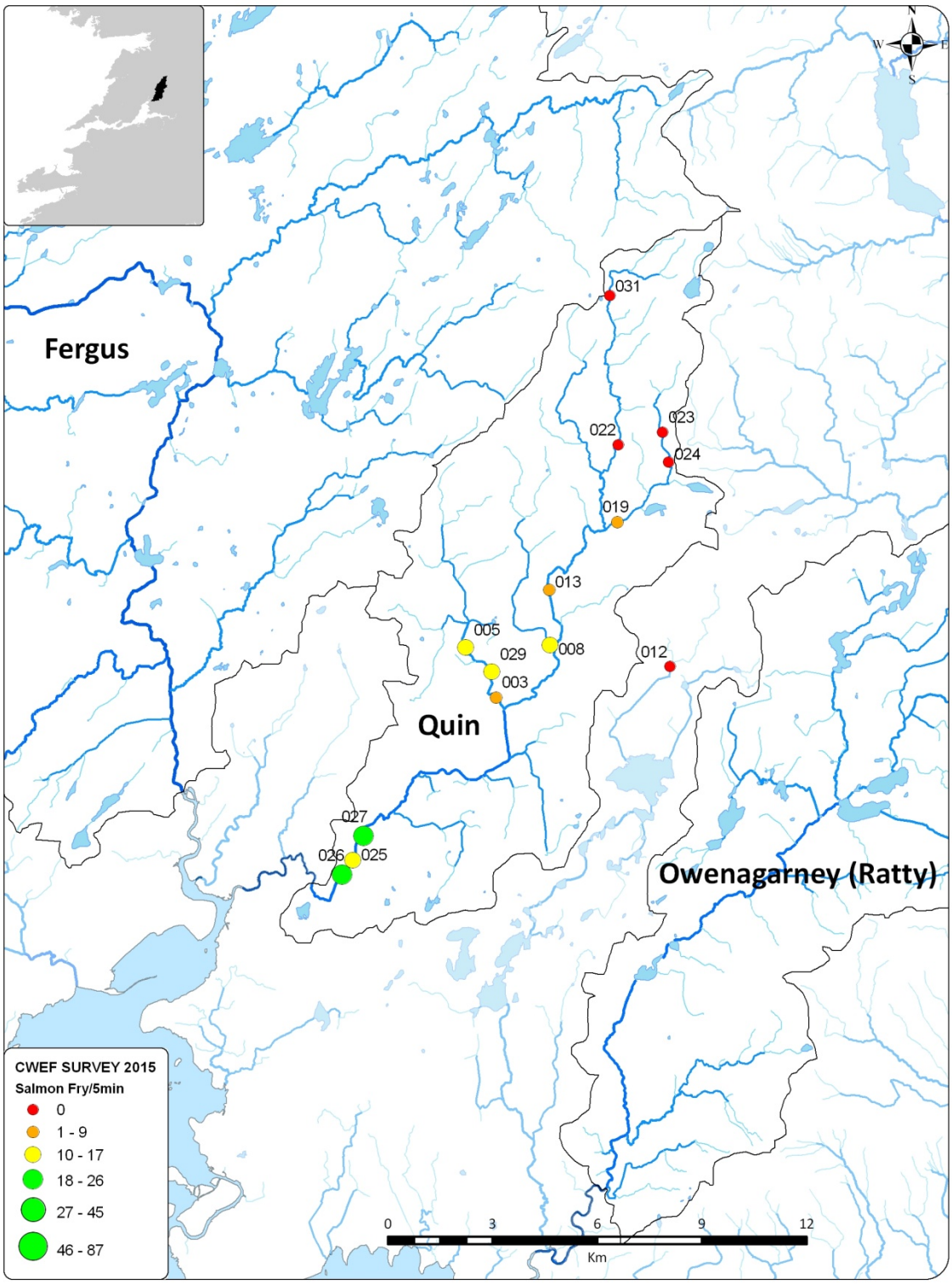
The Quin had a mean catch of 7.48 salfry/5min in 2015.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
3	144205.48	176923.86	3	2	5	Include	5.83
5	143335.52	178357.69	3	2	8	Include	9.41
8	145755.81	178428.59	2	2	10	Include	13.64
13	145724.05	180006.63	3	3	3	Include	4.13
19	147674.7	181946.47	2	1	0	Include	0
22	147710.44	184168.01	2	1	0	Include	0
23	148982.82	184527.96	2	1	0	Include	0
24	149155.4	183669.66	2	1	0	Include	0
25	140102.93	172261.01	4	1	12	Include	14.09
26	139795.65	171851.89	4	1	17	Include	19.62
27	140405.46	172957.56	4	1	17	Include	21.25
29	144081.57	177665.61	3	2	8	Include	9.33
31	147464.59	188437.83	2	1	0	Include	0
1	141752.67	174429.42	4	2	7	Efficiency below 60%	
2	144560.62	175378.2	4	2	1	Efficiency below 60%	
9	145904.92	178426.54	3	3	0	Not Sampled	
20	147210.32	181696.62	3		0	Not Sampled	
21	146806	182020	1		0	Not Sampled	
24	149161.95	183788.88	2		0	Not Sampled	
28	142731.33	174837.81	4	3	0	Not Sampled	
30	148156.15	182286.49	2		0	Not Sampled	

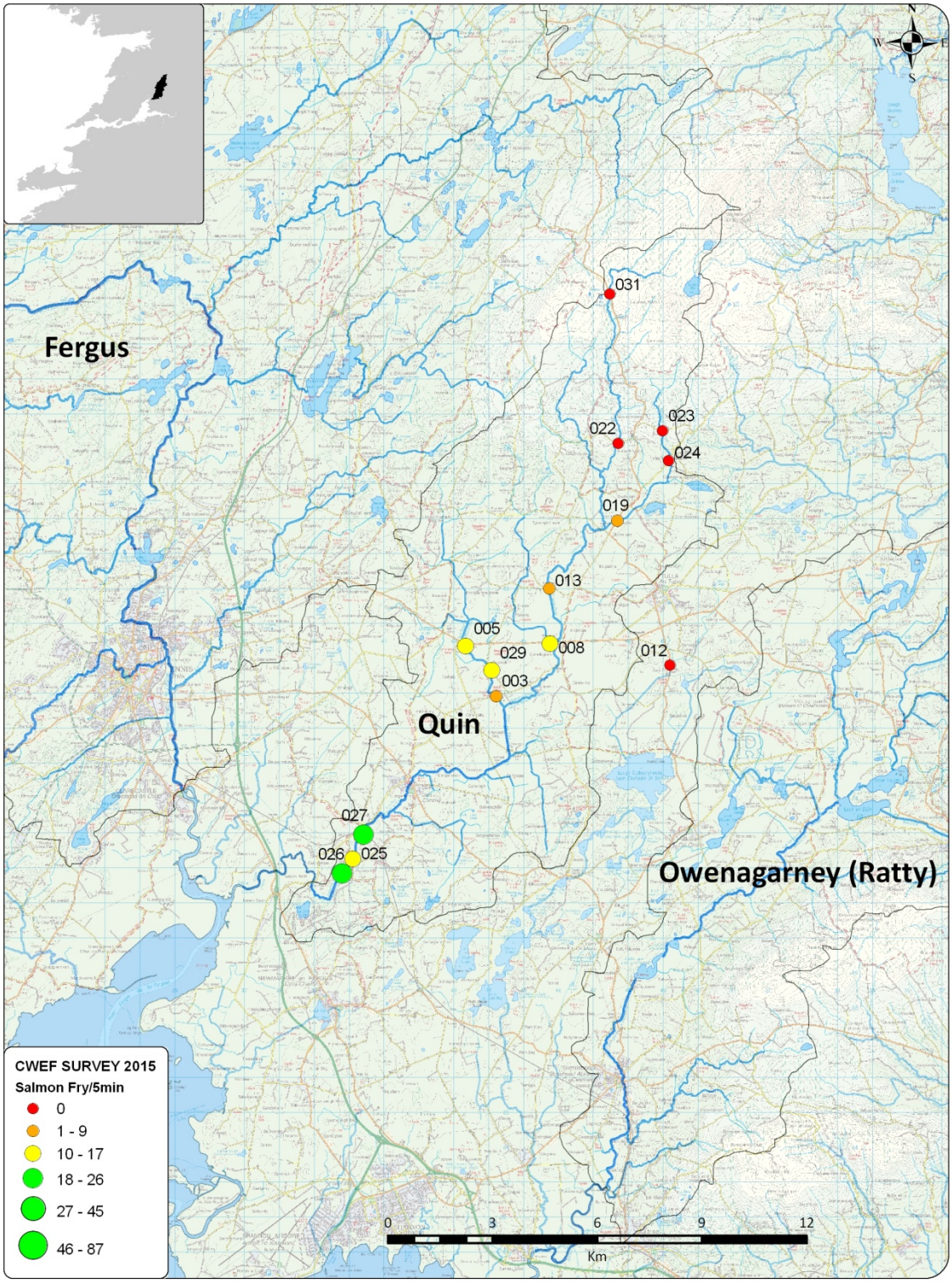
Table A.5.1.3: Site specific results of CWEF on the Quin catchment in 2015.



Map A.5.1.1: CWEF survey site locations 2015 on the Quin River.



Map A.5.1.2: CWEF survey site locations on the Quin River showing its location within the north Shannon estuary



Map A.5.1.3: CWEF survey site locations on the Quin River (OS Discovery Map)

A.5.2 The Fergus River

IFI Salmon Catchment #: 131
2015 survey dates: 4/8/2015 – 10/9/2015
Mean Salmon Fry/5 min (2015): 6.66 fry/5min.
CWEF Index: 7.29 fry/5min.

Sampling carried out by:

David Germaine
Jane Gilleran
Ken O'Neill
Ray Byrne

Fish Species Present:

Brown Trout
European Eel
Salmon
Stone Loach
Flounder
Perch
Pike
Crayfish
Three-spined Stickleback
Lamprey

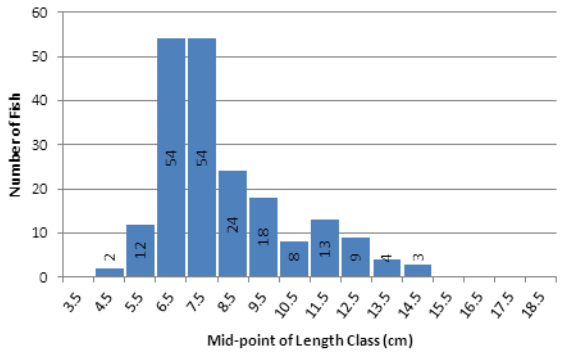


Figure A.5.2.1: Length distribution of salmon captured in 2015 CWEF survey on the Fergus Catchment.

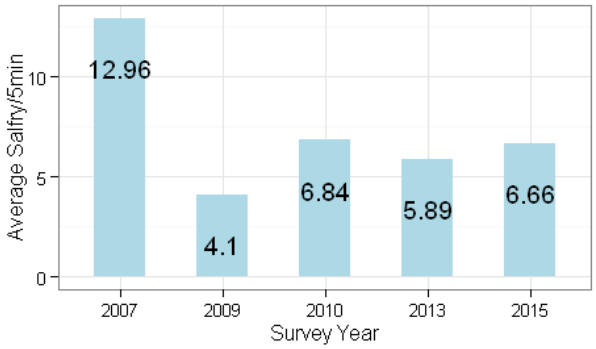


Figure A.5.2.2: Comparison of mean salfry/5 min for all surveys on the Fergus catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2007	19					12.28
2009	29	1	1	5		6.48
2010	32			1	6	5.98
2013	43	5		11	15	3.15
2015	27	1			25	4.40

Table A.5.2.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	2391	-1670	Closed	6.84	
2010	2011	2391	-1669	Closed		
2011	2012	2391	-1669	Closed		
2012	2013	2391	-1703	Closed	5.89	
2013	2014	2448	-2222	Closed		
2014	2015	2445	-2224	Closed	6.66	7.29

Table A.5.2.2: Conservation limits and provisional returns on the Fergus catchment along with the 2015 CWEF fishing result.

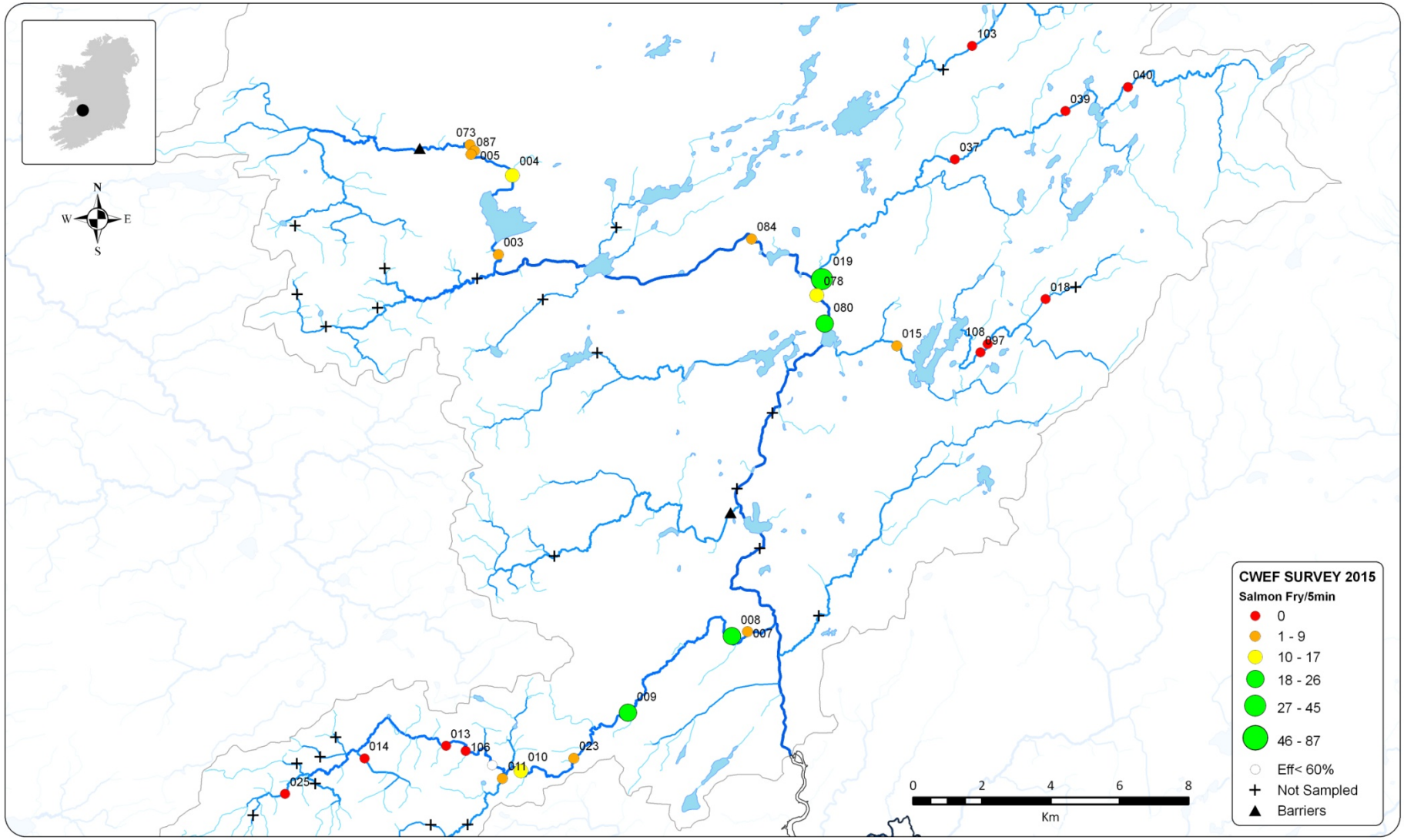
This survey, the fifth of this catchment in the 2007 to 2015 period, was carried out during August and September 2015. Survey teams visited 53 sites and sampled 28 of these, 27 of the surveyed sites were used in the analysis. Resulting in a good coverage of 4.4 km per survey site. Salmon fry were present at all but one site. The maximum fry catch was 27 salmon at site 19. The mean catch of included sites was 6.66 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 6.5cm.

Conclusion

The Fergus had a mean catch of 6.66 salfry/5min in 2015 resulting in a combined annual average of 7.29 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
3	126722	188781	4	1	7	Include	8.56
4	127127	191088	4	1	9	Include	11.25
5	126032	191794	4	2	5	Include	5.67
7	133961	177825	4	1	4	Include	4
8	133501	177703	4	1	20	Include	20
9	130479	175469	4	1	15	Include	18.33
10	127375	173771	4	1	17	Include	17
11	126840	173552	3	1	3	Include	3
13	125195	174508	4	1	0	Include	0
14	122826	174144	3	3	0	Include	0
15	138296	186127	3	1	3	Include	3.27
18	142618	187490	2	2	0	Include	0
19	136127	188070	3	1	27	Include	31.61
23	128917	174137	4	1	2	Include	2
25	120521	173109	3	1	0	Include	0
37	139985	191556	3	2	0	Include	0
39	143200	192958	3	1	0	Include	0
40	145013	193658	3	1	0	Include	0
73	125890	191967	4	1	7	Include	7
78	135973	187601	5		9	Include	12.6
80	136198	186778	5	1	21	Include	24.5
84	134078	189234	5	2	5	Include	6.11
87	125923	191694	4	2	5	Include	5
97	140723	185941	3	1	0	Include	0
103	140487	194852	3	2	0	Include	0
106	125770	174362	4	2	0	Include	0
108	140938	186190	3	1	0	Include	0
24	126536	173950	4	1	2	Efficiency below 60%	
12	125835	172214	3		0	Not Sampled	
26	121409	173409	3		0	Not Sampled	
29	128354	180014	3	2	0	Not Sampled	
43	128023	187479	2	3	0	Not Sampled	
45	123219	187237	1		0	Not Sampled	
59	143509	187838	2	1	0	Not Sampled	
61	121998	174749	2		0	Not Sampled	
62	121546	174182	2		0	Not Sampled	
63	120868	173986	2		0	Not Sampled	
64	119602	172486	2		0	Not Sampled	
65	124760	172206	2	3	0	Not Sampled	
69	136036	178289	3		0	Not Sampled	
71	130151	189565	2		0	Not Sampled	
81	134693	184180	5		0	Not Sampled	
86	134327	180247	5	1	0	Not Sampled	
88	129598	185929	2	3	0	Not Sampled	
98	123427	188384	1	3	0	Not Sampled	
99	121716	186692	2	3	0	Not Sampled	
100	120878	187625	2		0	Not Sampled	
101	120821	189616	1		0	Not Sampled	
102	139658	194156	3		0	Not Sampled	
104	0	0			0	Not Sampled	
105	0	0			0	Not Sampled	
107	133662	181975	5	1	0	Not Sampled	
109	126112	188091	4		0	Not Sampled	

Table A.5.2.3: Site specific results of CWEF on the Fergus catchment in 2015.



Map A.5.2.1: CWEF site survey locations on Fergus River.

A.5.3 The Skivaleen River

IFI Salmon Catchment #: 134
2015 survey dates: 18/8/2015 - 9/9/2015
Mean Salmon Fry/5 min (2015): 11.68 fry/5min.
CWEF Index: 13.25 fry/5min.

Sampling carried out by:

David Germaine
Ray Byrne

Fish Species Present:

Brown Trout
European Eel
Flounder
Salmon

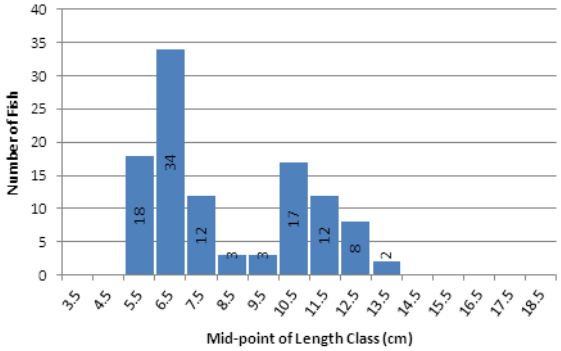


Figure A.5.3.1: Length distribution of salmon captured in 2015 CWEF survey on the Skivaleen Catchment.

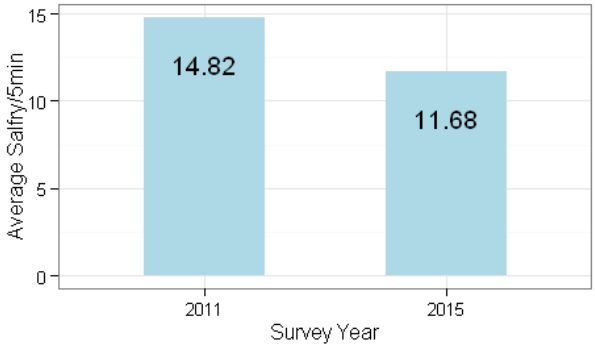


Figure A.5.3.2: Comparison of mean salfry/5 min for all surveys on the Skivaleen catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2011	5	4			7	2.49
2015	7				3	2.99

Table A.5.3.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	372	-180	Closed		
2010	2011	372	-180	Closed	14.82	
2011	2012	372	-180	Closed		
2012	2013	372	-180	Closed		
2013	2014	457	-299	Closed		
2014	2015	457	-299	Catch and Release	11.68	13.25

Table A.5.3.2: Conservation limits and provisional returns on the Skivaleen catchment along with the 2015 CWEF fishing result.

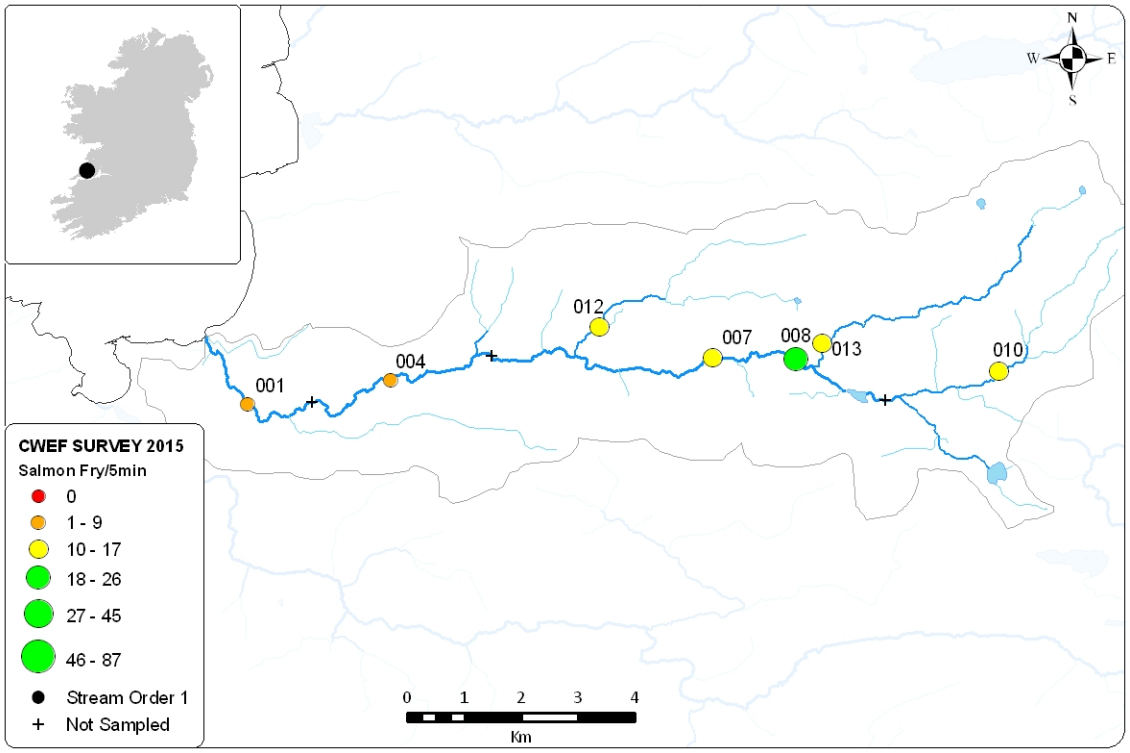
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during August 2015. The survey teams visited 10 sites and sampled 7 of these, all of which were used in the analysis resulting in a good coverage of 2.99km per survey site. Salmon fry were present at all 7 surveyed sites. The maximum fry catch was 19 salmon at site 8. The mean catch of included sites was 11.68 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 6.5cm.

Conclusion

The Skivaleen had a mean catch of 11.68 salfry/5min in 2015 resulting in a combined annual average of 13.25 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	99119	166013	3	2	6	Include	6.67
3	100253	166051	3		0	Not Sampled	
4	101636	166442	3	2	5	Include	5.83
5	103412	166868	3		0	Not Sampled	
7	107298	166821	3	1	12	Include	13.78
8	108779	166811	3	1	19	Include	21.62
9	110353	166078	3		0	Not Sampled	
10	112336	166592	2	1	11	Include	12.38
12	105306	167362	2	1	8	Include	9.45
13	109227	167082	2	1	10	Include	12

Table A.5.3.3: Site specific results of CWEF on the Skivaleen catchment in 2015.



Map A.5.3.1: CWEF site survey locations 2015 on the Skivaleen.

A.5.4 The Inagh River

IFI Salmon Catchment #: 142
2015 survey dates: 20/8/2014 - 9/9/2014
Mean Salmon Fry/5 min (2015): 3.59 fry/5min.
CWEF Index: 4.45 fry/5min.

Sampling carried out by:

David Germaine
Flan Ryan
Ray Byrne
Ken O'Niell

Fish Species Present:

Brown Trout
Salmon
Stone Loach
Three-spined Stickleback

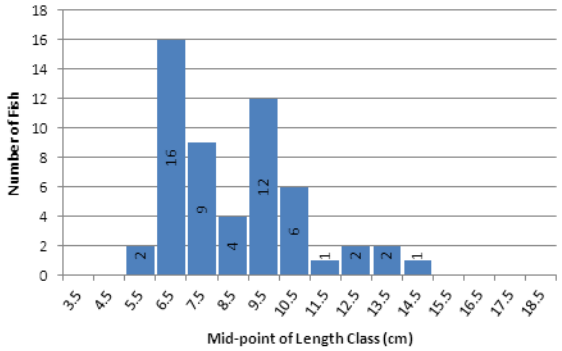


Figure A.5.4.1: Length distribution of salmon captured in 2015 CWEF survey on the Inagh Catchment.

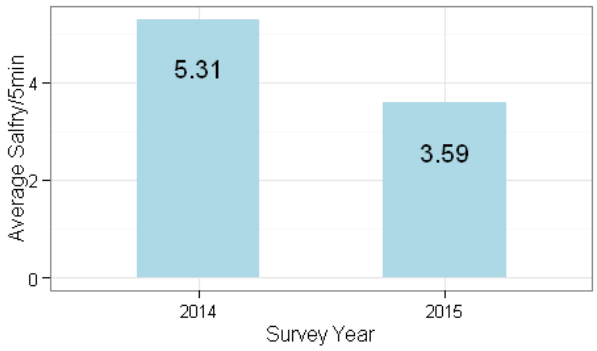


Figure A.5.4.2: Comparison of mean salfry/5 min for all surveys on the Inagh catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2014	19				11	4.02
2015	17				6	5.25

Table A.5.4.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	1032	-665	Closed		
2010	2011	1032	-665	Closed		
2011	2012	1032	-665	Closed		
2012	2013	1032	-669	Closed		
2013	2014	1095	-861	Closed	5.31	
2014	2015	1095	-859	Closed	3.59	4.45

Table A.5.4.2: Conservation limits and provisional returns on the Inagh catchment along with the 2015 CWEF fishing result.

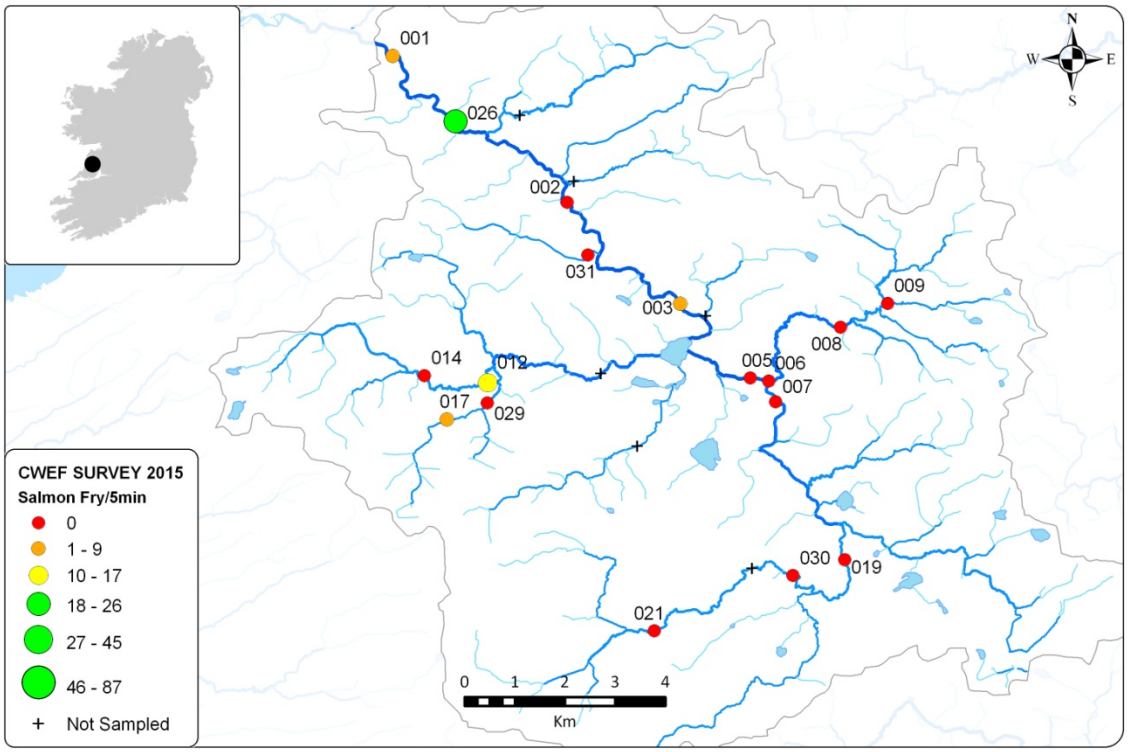
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during August and September 2015. Twenty three sites were visited, though due to lack of suitable habitat only 17 were sampled. All 17 were included in the analysis giving coverage of 5.25km per survey site. Salmon fry were present at only 5 sites. The maximum fry catch was 25 salmon at site 26. The mean catch of included sites was 3.59 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 6.5cm.

Conclusion

The Inagh had a mean catch of 3.59 salfry/5min in 2015 resulting in a combined annual average of 4.45salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	113194	188193	5	1	7	Include	8.27
2	116675	185281	5	1	0	Include	0
3	118937	183248	5	2	3	Include	3.75
5	120326	181775	5	1	0	Include	0
6	120695	181717	4	1	0	Include	0
7	120836	181305	4	2	0	Include	0
8	122129	182790	4	1	0	Include	0
9	123070	183267	3	1	0	Include	0
12	115090	181677	3	1	14	Include	17
14	113825	181823	3	1	0	Include	0
17	114273	180944	2	1	7	Include	7
19	122211	178154	3	2	0	Include	0
21	118416	176734	3		0	Include	0
26	114441	186894	5	1	25	Include	25
29	115079	181280	3	1	0	Include	0
30	121182	177835	3	1	0	Include	0
31	117090	184228	2	2	0	Include	0
4	119443	183013	2		0	Not Sampled	
10	117351	181860	4	3	0	Not Sampled	
20	120367	177978	3		0	Not Sampled	
24	116812	185690	2	1	0	Not Sampled	
25	115733	187009	3	1	0	Not Sampled	
27	118078	180412	2		0	Not Sampled	

Table A.5.4.3: Site specific results of CWEF on the Inagh catchment in 2015.



Map A.5.4.1: CWEF survey site locations on the Inagh River.

A.6 Western River Basin District

A.6.1 Summary

Since 2007, twenty eight rivers have been surveyed in the Western River Basin District (WRFB) as part of the on-going catchment-wide electrofishing surveys. These are presented in table A.6.1. Six rivers currently have a survey average salmon fry capture rate of greater than 17 fry per 5min, these are the Culfin, the Erriff, Carrownisky, Owenmore, Carrowmore and Drumcliff. Six catchments were surveyed in 2015. The Erriff had good numbers of salmon fry; low abundance was recorded returned from the other rivers; the survey on Lough Na Furnace stream found no salmon at all.

	Survey Year									Current Index	# of Annual Surveys Considered
IFI Code/ River	2007	2008	2009	2010	2011	2012	2013	2014	2015		
145/Kilcolgan			2.51							2.51	1
146/Clarinbridge					7.26					7.26	1
147/Corrib	15.75									15.75	1
148/Knock					12.53					12.53	1
149/Owenboliska (Spiddal)		4.06						4.52		4.29	2
152/Cashla							10.83			10.83	1
154/L. Na Furnace stream									0.00	0.00	1
163/Owenglin			11.57							11.57	1
167/Culfin		30.83								30.83	1
168/Erriff	29.51	24.10	16.03	20.43	20.86	24.45	27.45	24.90	28.52	25.24	5
171/Carrownisky		18.25				20.60	18.22			19.03	3
172/Bunowen			13.62							13.62	1
173/Owenwee (Belclare)				8.47	7.25	15.27				10.33	3
178/Newport (L. Beltra)	16.06		5.53					17.36		12.99	3
179/Srahmore			4.33							4.33	1
181/Owengarve			5.51					6.19	0.72	4.14	3
186/Owenmore - MC (Bangor)							28.76			28.76	1
185/Owenduff (Bangor)			6.00					6.20		6.10	2
186/Owenmore- Carrowmore							23.07			23.07	1
187/Glenamoy	28.16		5.65							16.91	2
188/Muingnabo	0.78								1.88	1.33	2
193/Ballinglen	10.65				15.09		6.37			10.70	3
194/Cloonaghmore (Palmerstown)		8.96		9.71	22.27	17.32	15.02			14.65	5
196/Brusna			4.70				14.16	14.74		11.20	3
198/Leaffony	5.76		7.95						1.73	5.15	3
203/Garvogue (Bonnet)	18.41	13.26	16.83	11.31	7.08	18.54				13.41	5
205/Drumcliff				17.72						17.72	1
207/Grange	5.75		3.29						4.56	4.53	3

Table A.6.1.1: Catchment-wide Electrofishing data for WRBD 2007- 2015 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

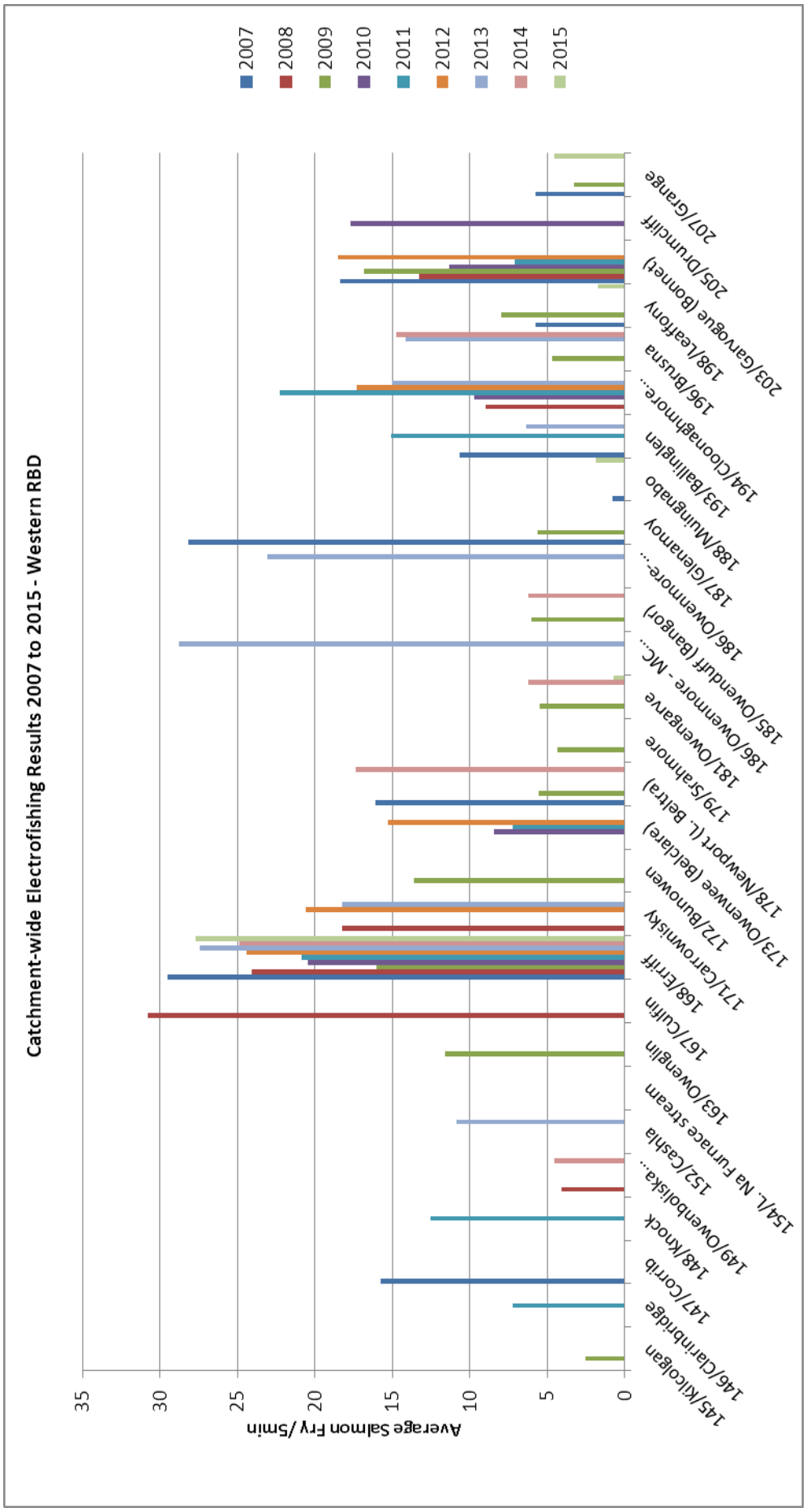


Chart A.6.1: Summary of CWEF results in WRFB from 2007 to 2015.

A.6.2 The Lough Na Furnace Stream

IFI Salmon Catchment #: 154
2015 survey dates: 30/9/2015
Mean Salmon Fry/5 min (2015): 0 fry/5min.
CWEF Index: 0 fry/5min.

Sampling carried out by:

Paddy Gargan
Kevin Kerrigan

Fish Species Present:

Brown Trout
European Eel

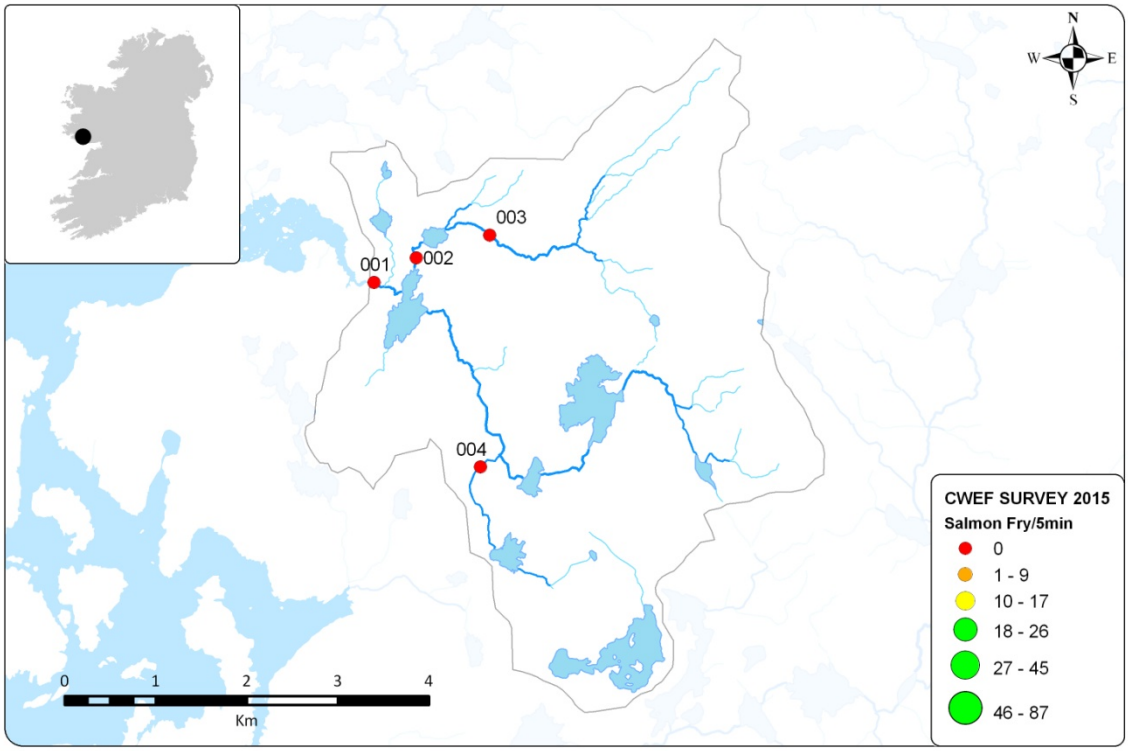
This is the first CWEF survey of this catchment in the 2007 to 2015 period and it was carried out during September 2015. The survey comprised 4 sites, all of which were included in the analysis giving a good coverage of 2.93 km per survey site. Salmon fry were absent from all sites. Trout were present at all sites and eels were present at two. This catchment has 3.1 ha of river accessible to salmon (McGinnity et al., 2012), comprising about 0.03% of the national salmonid riverine habitat. Most other rivers of this size are not considered to be significant producers of salmon, and are not open for angling.

Conclusion

The survey on Lough Na Furnace steam produced no salmon at all. Trout were present at all sites. It is unlikely that this river has a resident population of salmon.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	97222	237256	3	3	0	Include	0
2	97685	237525	3	2	0	Include	0
3	98490	237776	3	1	0	Include	0
4	98389	235229	2	3	0	Include	0

Table A.6.2.3: Site specific results of CWEF on the L. Na Furnace catchment in 2015.



Map A.6.2.1: CWEF survey site location 2015 on L. Na Furnace Stream.

A.6.3 The Erriff River

IFI Salmon Catchment #: 168
2015 survey dates: 7/9/2015 - 10/9/2015
Mean Salmon Fry/5 min (2015): 28.52 fry/5min.
CWEF Index: 25.24 fry/5min.

Sampling carried out by:

Declan Doyle
Donovan Brinklow
John Flanagan
Paddy Gargan
Tony Holmes
John Kilcoyne

Fish Species Present:

Brown Trout
European Eel
Minnow
Salmon
Three Spined Stickleback

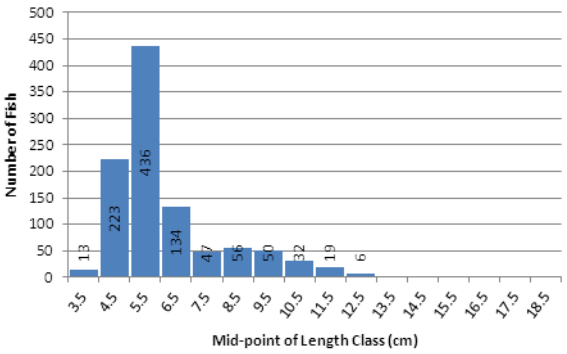


Figure A.6.3.1: Length distribution of salmon captured in 2015 CWEF survey on the Erriff Catchment.

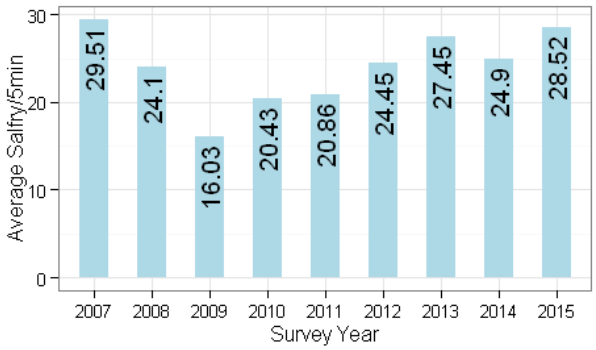


Figure A.6.3.2: Comparison of Mean Salfry/5 min for surveys on the Erriff catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2011	32		1	1	1	4.05
2012	33		1	1		4.05
2013	33		1			4.17
2014	34		1			4.05
2015	35		1	1		3.83

Table A.6.3.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	1299	715	Open	20.43	
2010	2011	1299	512	Open	20.86	
2011	2012	1299	605	Open	24.45	
2012	2013	1299	592	Open	27.45	
2013	2014	1382	520	Open	24.90	
2014	2015	1382	669	Open	28.52	25.24

Table A.6.3.2: Conservation limits and provisional returns on the Erriff catchment along with the 2015 CWEF fishing result.

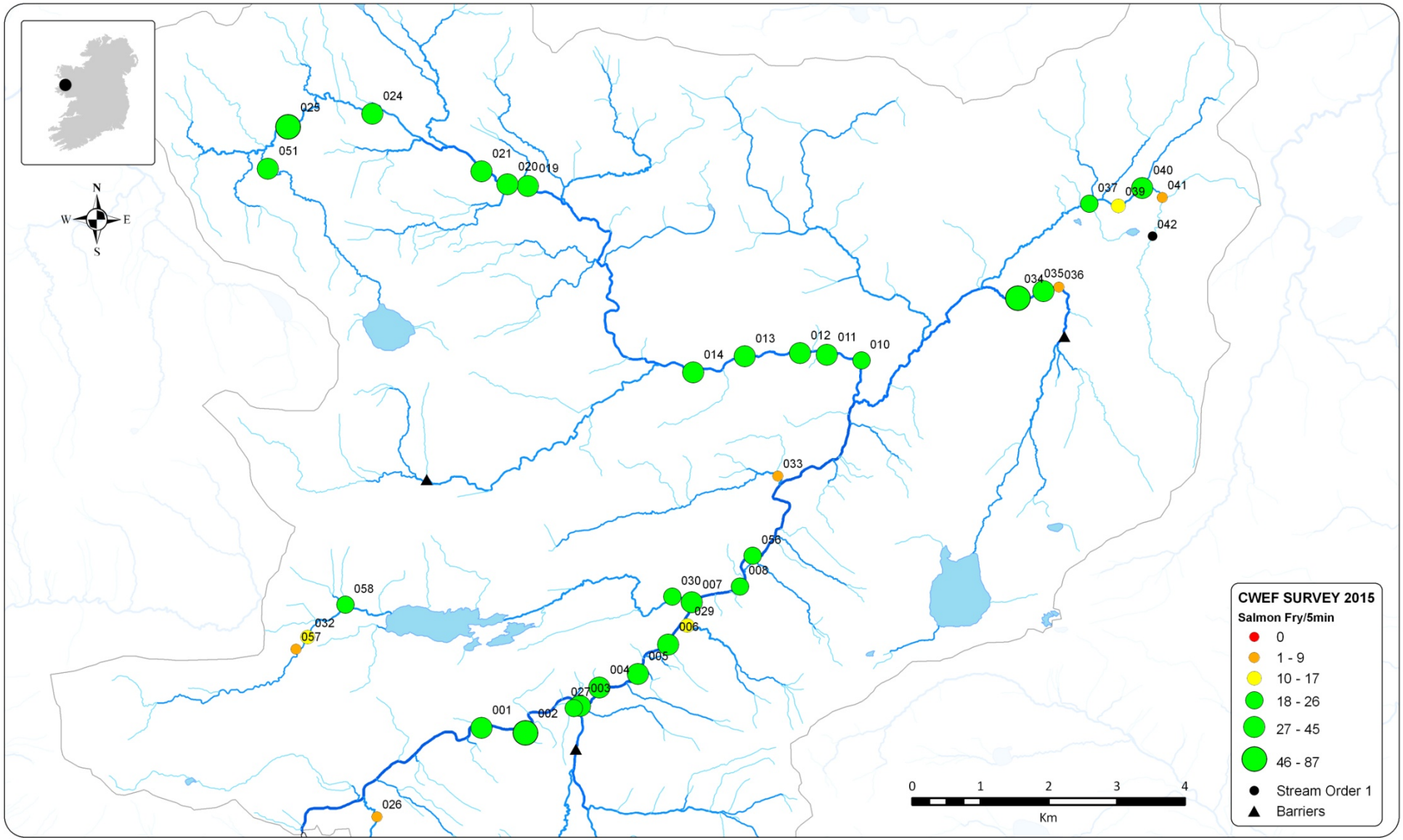
This survey of IFI's National Salmonid Index Catchment, the eighth in the 2007 to 2015 period, was carried out during September 2015. The survey comprised 36 sites, 35 of which were included in the analysis giving a good coverage of 3.83 km per survey site. Salmon fry were present at all sites. The maximum fry catch was 54 salmon at site 2. The mean catch of included sites was 28.52 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 5.5cm.

Conclusion

The Erriff had a mean catch of 28.52 salfry/5min in 2015 resulting in a combined annual average of 25.24 salmon fry/5min.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	92057	265797	5	1	24	Include	28
2	92702	265721	5	2	54	Include	60
3	93503	266122	5	2	33	Include	39
4	93785	266390	5	1	33	Include	38
5	94353	266590	5	2	38	Include	40.92
6	94798	267020	5	2	28	Include	35
7	95142	267641	5	2	36	Include	40
8	95847	267875	5	2	20	Include	25
10	97631	271190	4	2	20	Include	24
11	97126	271270	4	2	26	Include	35.29
12	96732	271296	4	1	22	Include	27
13	95920	271252	4	1	27	Include	31.82
14	95163	271013	4	1	22	Include	32
19	92740	273749	4	1	31	Include	41.25
20	92439	273774	4	1	19	Include	28.05
21	92057	273962	4	2	26	Include	35.29
24	90455	274810	3	2	25	Include	31.73
25	89217	274613	3	1	40	Include	52.38
26	90525	264492	3	2	6	Include	6.86
27	93408	266092	4	1	22	Include	26
29	95077	267299	3	3	10	Include	12
30	94855	267725	3	3	21	Include	25.77
32	89507	267128	2	2	9	Include	11.77
33	96407	269493	3	2	7	Include	8.4
34	99926	272098	4	1	40	Include	60
35	100302	272204	4	1	28	Include	36
36	100529	272264	4	2	6	Include	8.57
37	100973	273488	3	2	15	Include	17.25
39	101401	273457	3	3	13	Include	16.25
40	101753	273718	3	1	24	Include	28.44
41	102047	273579	2	1	4	Include	4
42	101904	273012	1	3	2	Stream order<2	
51	88924	274002	2	2	34	Include	38.86
56	96035	268325	5	2	22	Include	26
57	89337	266953	2	2	3	Include	3.6
58	90058	267606	3	1	19	Include	22.8

Table A.6.3.3: Site specific results of CWEF on the Erriff catchment in 2015.



Map A.6.3.1: CWEF survey site locations 2015 on the Erriff River.

A.6.4 The Owengarve River

IFI Salmon Catchment #: 181
2015 survey dates: 28/9/2015
Mean Salmon Fry/5 min (2015): 0.72 fry/5min.
CWEF Index: 4.14 fry/5min.

Sampling carried out by:

Tommy Ginnelly
A. Cusack

Fish Species Present:

Brown Trout Salmon
European Eel

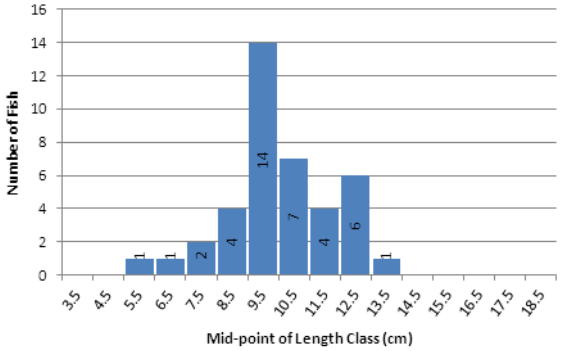


Figure A.6.4.1: Length distribution of salmon captured in 2015 CWEF survey on the Owengarve Catchment.

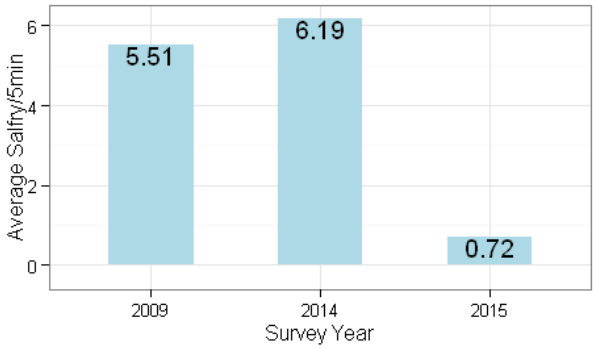


Figure A.6.4.2: Comparison of mean salfry/5 min for all surveys on the Owengarve catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2009	3	1				6.24
2014	9					2.77
2015	5					4.99

Table A.6.4.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	193	-90	Closed		
2010	2011	193	-90	Closed		
2011	2012	193	-90	Closed		
2012	2013	193	-90	Closed		
2013	2014	226	-143	Closed	6.19	
2014	2015	226	-143	Closed	0.72	4.14

Table A.6.4.2: Conservation limits and provisional returns on the Owengarve catchment along with the 2015 CWEF fishing result.

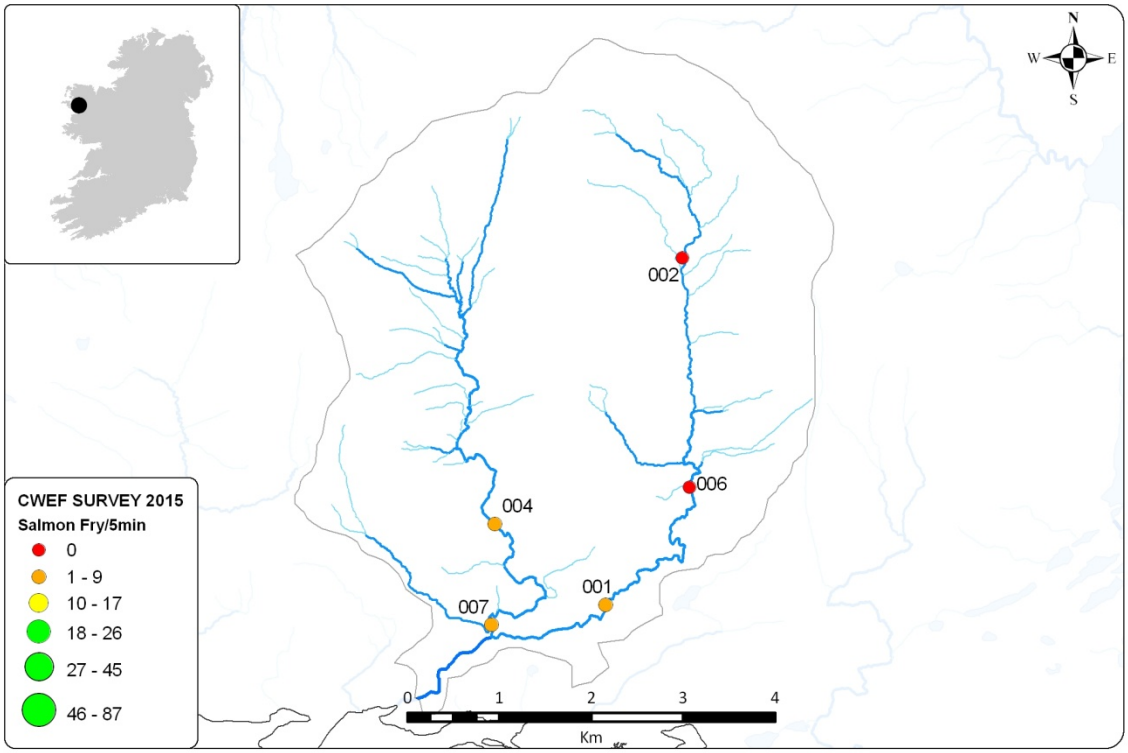
This survey, the third of this catchment in the 2007 to 2015 period, was carried out during September 2015. The survey comprised 5 sites, all of which were included in the analysis giving a good coverage of 4.99 km per survey site. Salmon fry were present at 3 sites. The maximum fry catch was only 1 salmon at each of the sites where salmon was present. The mean catch of included sites was 0.72 salmon fry/5min. The modal length category of juvenile salmon caught was 8.5 cm.

Conclusion

The Owengarve had a mean catch of 0.72 salfry/5min in 2015 resulting in a combined annual average of 4.14 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	90429	297020	3	3	1	Include	1.25
2	91264	300790	2	2	0	Include	0
4	89226	297897	3	2	1	Include	1.33
6	91346	298297	3	3	0	Include	0
7	89185	296804	3	1	1	Include	1

Table A.6.4.3: Site specific results of CWEF on the Owengarve catchment in 2015.



Map A.6.4.1: CWEF survey site locations 2015 on the Owengarve River.

A.6.5 The Muingnabo River

IFI Salmon Catchment #: 188
2015 survey dates: 29/9/2015
Mean Salmon Fry/5 min (2015): 1.88 fry/5min.
CWEF Index: 1.33 fry/5min.

Sampling carried out by:

A. Cusack
Tommy Ginnelly

Fish Species Present:

Brown Trout
European Eel
Salmon
Three-spined Stickleback

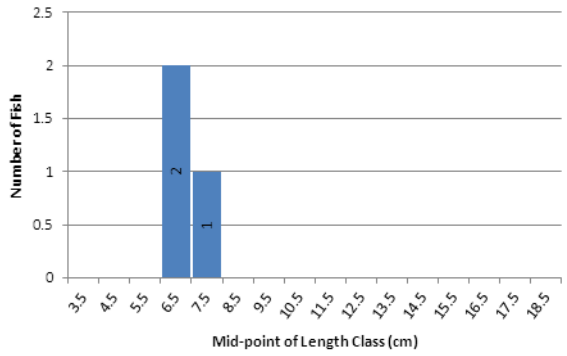


Figure A.6.5.1: Length distribution of salmon captured in 2015 CWEF survey on the Muingnabo Catchment.

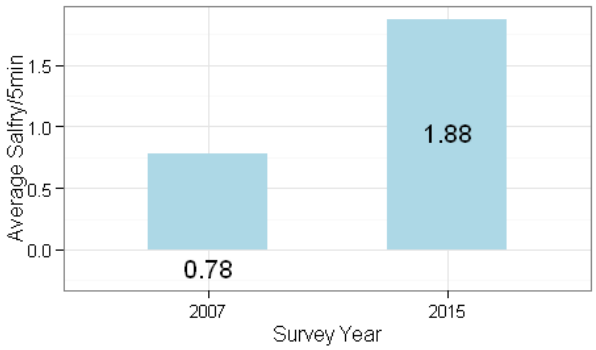


Figure A.6.5.2: Comparison of mean salfry/5 min for all surveys on the Muingnabo catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2007	4	1				8.44
2013	2					16.88

Table A.6.5.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	350	-162	Closed		
2010	2011	350	-162	Closed		
2011	2012	350	-162	Closed		
2012	2013	350	-162	Closed		
2013	2014	336	-199	Closed		
2014	2015	336	-199	Closed	1.88	1.33

Table A.6.5.2: Conservation limits and provisional returns on the Muingnabo catchment along with the 2015 CWEF fishing result.

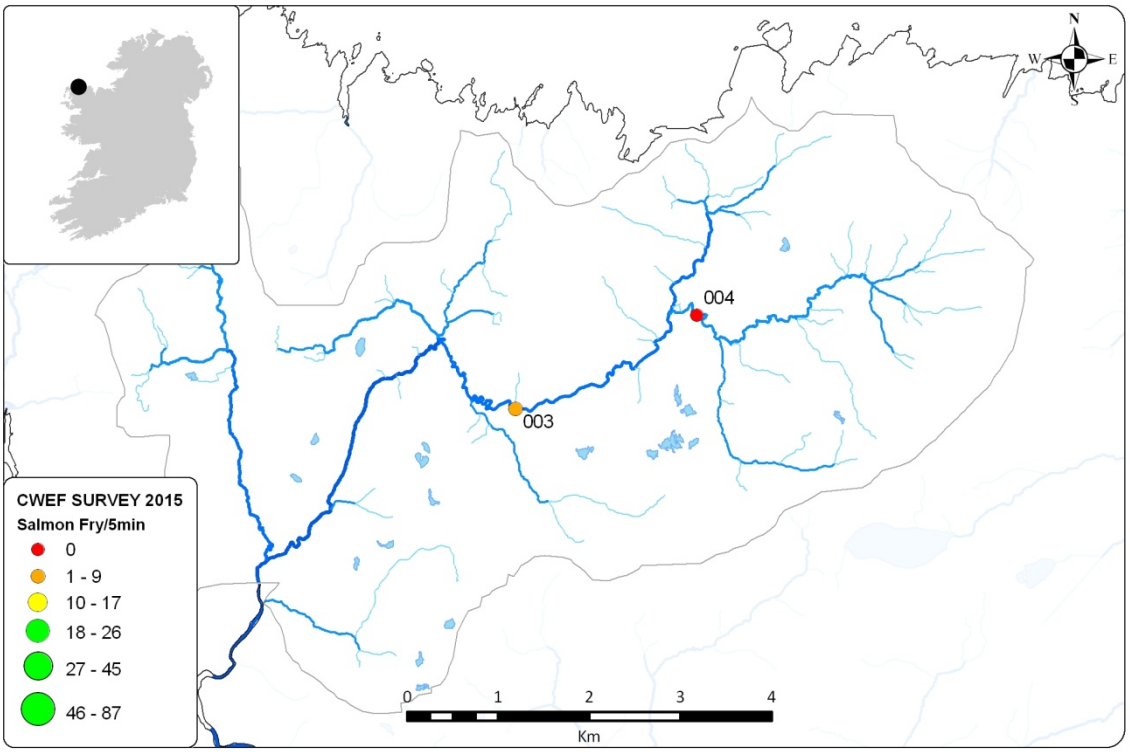
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during in September 2015. The survey comprised just 2 sites, both of which were included in the analysis. Salmon fry were present at one site. The total salmon catch was three fry. The mean catch was 1.88 salmon fry/5min. The modal length category of fry caught was 6.5cm.

Conclusion

The Muingnabo had a mean catch of 1.88 salfry/5min in 2015 resulting in a combined annual average of 1.33 Salmon fry/5min; this is substantially below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
3	90622	339077	4	2	3	Include	3.75
4	92616	340115	3	3	0	Include	0

Table A.6.5.3: Site specific results of CWEF on the Muingnabo catchment in 2015.



Map A.6.5.1: CWEF survey site locations 2015 on the Muingnabo River.

A.6.6 The Leaffony River

IFI Salmon Catchment #: 198
2015 survey dates: 7/8/2015 - 12/8/2015
Mean Salmon Fry/5 min (2015): 1.73 fry/5min.
CWEF Index: 5.15 fry/5min.

Sampling carried out by:

Brian Flannerry
Eddie Doherty
Padraic Traynor
Peter Meenaghan

Fish Species Present:

Brown Trout
European Eel
Salmon
Three-spined Stickleback

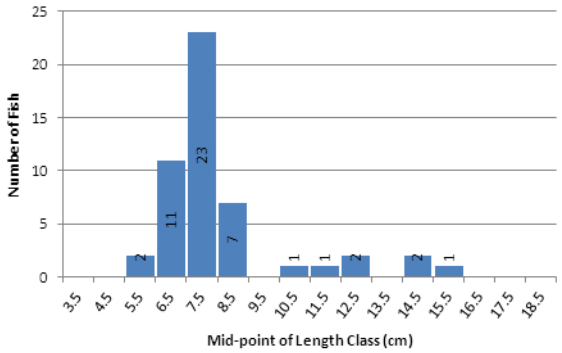


Figure A.6.6.1: Length distribution of salmon captured in 2015 CWEF survey on the Leaffony Catchment.

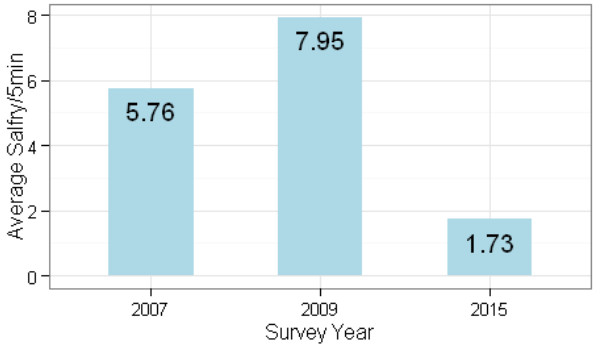


Figure A.6.6.2: Comparison of mean salfry/5 min for all surveys on the Leaffony catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2007	6					4.20
2013	12	2				1.80
2014	13	1				1.80

Table A.6.6.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	217	-136	Closed		
2010	2011	217	-136	Closed		
2011	2012	217	-136	Closed		
2012	2013	217	-136	Closed		
2013	2014	240	-184	Closed		
2014	2015	240	-185	Closed	1.73	4.84

Table A.6.6.2: Conservation limits and provisional returns on the Leaffony catchment along with the 2015 CWEF fishing result.

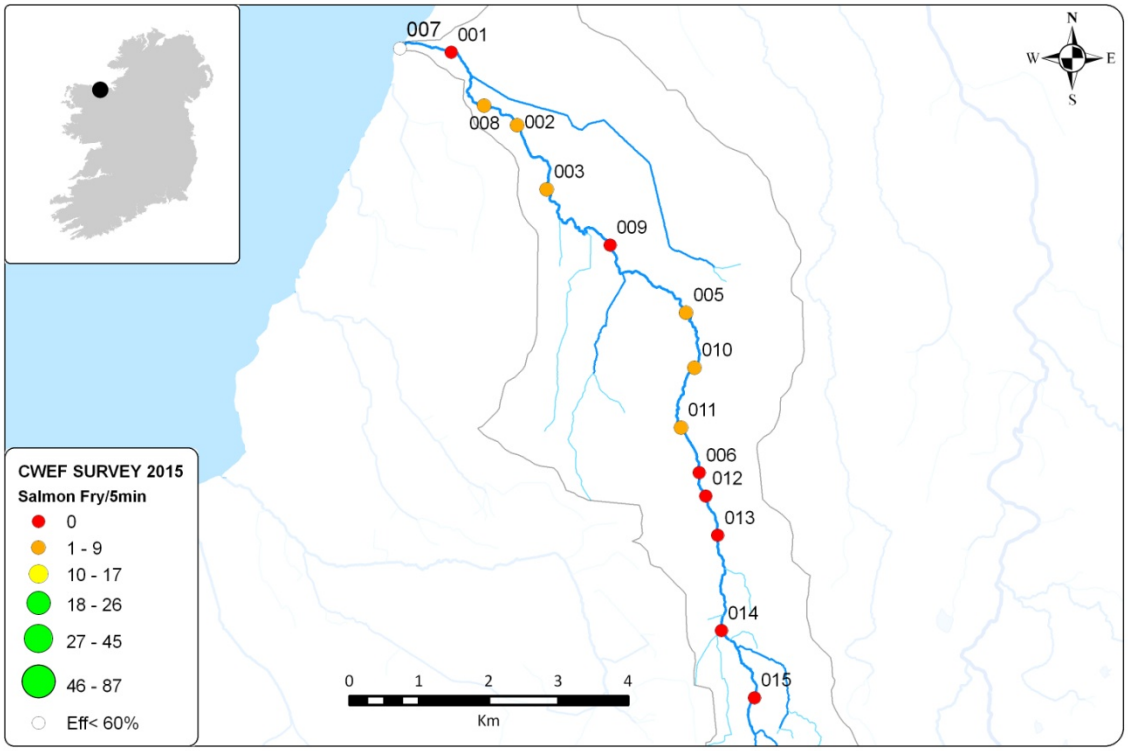
This survey, the third of this catchment in the 2007 to 2015 period, was carried out during August 2015. The survey comprised 14 sites, 13 of which were included in the analysis giving a good coverage of 1.8 km per survey site. Salmon fry were present at 7 sites. The maximum fry catch was 5 salmon at site 11. The mean catch of included sites was 1.73 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 7.5cm.

Conclusion

The Leaffony had a mean catch of 1.73 salfry/5min in 2015 resulting in a combined annual average of 5.15 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	131581	335849	3	1	0	Include	0
2	132532	334795	3	2	3	Include	3.75
3	132956	333877	3		1	Include	1
5	134957	332105	3	1	1	Include	1.55
6	135147	329815	3	2	0	Include	0
7	130841	335904	3	1	1	Efficiency below 60%	
8	132055	335080	3	1	4	Include	5.6
9	133864	333084	3	2	0	Include	0
10	135077	331318	3		4	Include	5.6
11	134885	330459	3	2	5	Include	5
12	135237	329482	3	2	0	Include	0
13	135411	328915	3	1	0	Include	0
14	135464	327549	3	2	0	Include	0
15	135938	326585	3	2	0	Include	0

Table A.6.6.3: Site specific results of CWEF on the Leaffony catchment in 2015.



Map A.6.6.1: CWEF survey site locations 2015 on the Leaffony River.

A.6.7 The Grange River

IFI Salmon Catchment #: 207
2015 survey dates: 2/9/2015
Mean Salmon Fry/5 min (2015): 4.56 fry/5min.
CWEF Index: 4.53 fry/5min.

Sampling carried out by:

Lee Hancox
Tony Holmes

Fish Species Present:

Brown Trout
European Eel
Salmon
Flounder
Three-Spined Stickleback

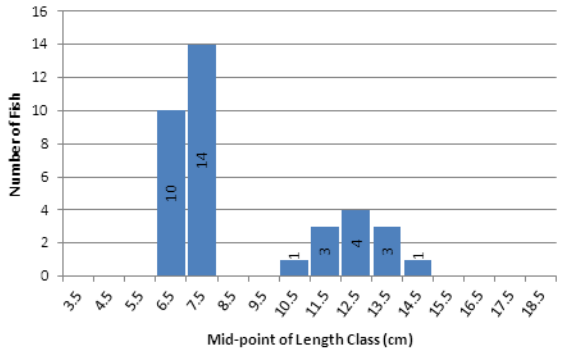


Figure A.6.7.1: Length distribution of salmon captured in 2015 CWEF survey on the Grange Catchment.

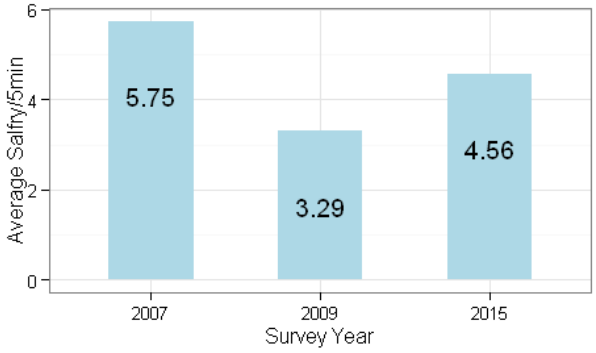


Figure A.6.7.2: Comparison of mean salfry/5 min for all surveys on the Grange catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2007	4	1				8.40
2009	6					7.00
2015	6	1				6.00

Table A.6.7.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	356	-139	Catch and Release		
2010	2011	356	-114	Catch and Release		
2011	2012	356	-114	Catch and Release		
2012	2013	356	-112	Not Salmon River		
2013	2014	330	-141	Not Salmon River		
2014	2015	329	-141	Closed	4.56	3.93

Table A.6.7.2: Conservation limits and provisional returns on the Grange catchment along with the 2015 CWEF fishing result.

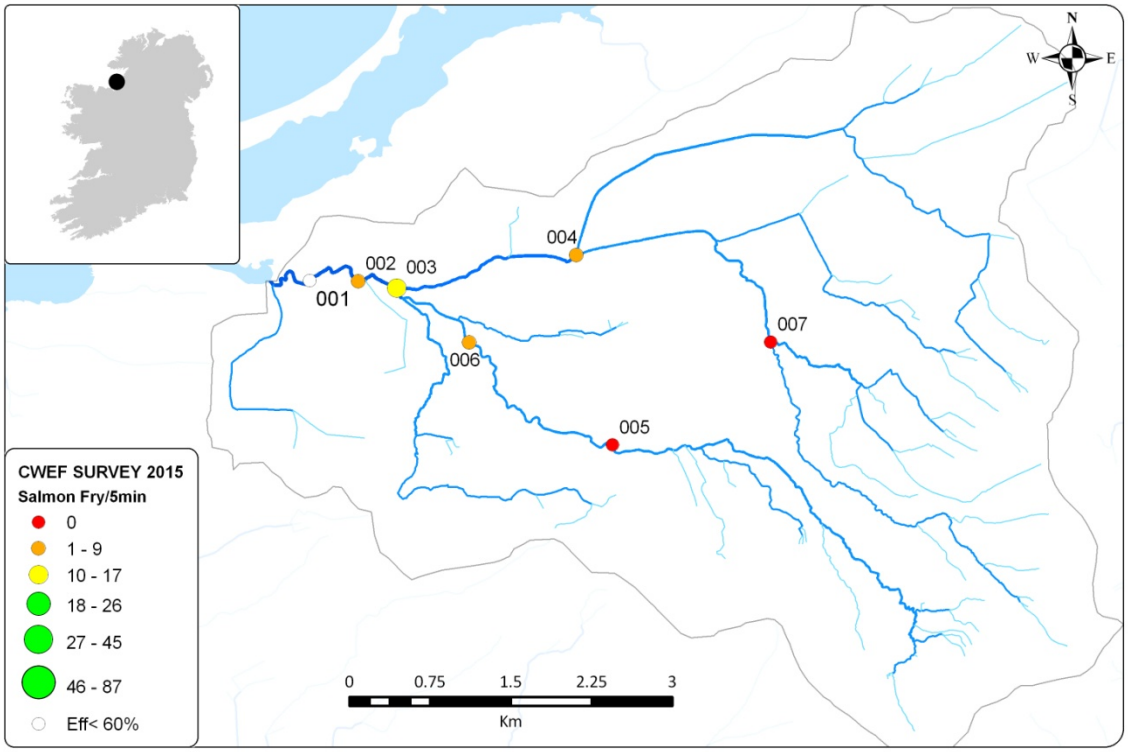
The survey was carried out during September 2015. The survey comprised 7 sites, 6 of which were included in the analysis. Salmon fry were present at 5 sites. The maximum fry catch was 11 salmon at site 3. The mean catch of included sites was 4.56 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 7.5cm.

Conclusion

The Grange had a mean catch of 4.56 salfry/5min in 2015 resulting in a combined annual average of 4.53 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	165066	349508	5	1	2	Efficiency below 60%	
2	165519	349497	5	2	6	Include	7.8
3	165876	349438	5	1	11	Include	13.59
4	167545	349739	3	1	3	Include	3.55
5	167884	347984	3	1	0	Include	0
6	166552	348930	3	1	2	Include	2.43
7	169353	348938		2	0	Include	0

Table A.6.7.3: Site specific results of CWEF on the Grange catchment in 2015.



Map A.6.7.1: CWEF survey site locations 2015 on the Grange River.

A.7 North Western River Basin District

A.7.1 Summary

Since 2007, thirty one rivers have been surveyed in the North Western River Basin District (NWRBD) as part of the on-going catchment-wide electrofishing surveys. These are presented in table A.4.7.1.1. Nine rivers including the Abbey, Eany, Oily, Bungosteen, Glen, Owentocker, Clady, the Lackagh and the Leannan currently have a survey average salmon fry abundance exceeding 17 fry per 5min. Ten rivers were surveyed in 2015; only the Glen had survey results above 17 salmon fry/5min for this survey. The Erne, Clonmany, and Donagh had poor results; the Mill, Straid and Culoort surveys found no salmon fry.

	Survey Year									Current Index	# of Annual Surveys Considered
IFI Code/ River	2007	2008	2009	2010	2011	2012	2013	2014	2015		
208/Duff	7.84	9.31	18.59	25.16						15.23	4
210/Erne		7.37	0.17	0.08	0.00	0.00	0.00	1.60	1.16	0.55	5
211/Abbey							7.20	28.14		17.67	2
212/Ballintra			10.27				13.40	18.07		13.91	3
213/Laghy			8.58				14.97	11.02		11.52	3
214/Eske		13.10	16.99	16.30					13.45	14.96	4
215/Eany				15.86		30.08			12.89	19.61	3
216/Oily			9.49		33.68			16.62		19.93	3
217/Bungosteen					25.12		17.09			21.11	2
219/Glen (Ballyshannon)				19.44					18.37	18.91	2
220/Owenwee (Yellow R)	21.45	5.00	14.81			20.31	19.65			16.24	5
221/Bracky		10.82				21.57		12.24		14.88	3
222/Owentocker		20.06								20.06	1
226/Owenamarve			3.76				2.64	1.00		2.47	3
228/Gweedore (Crolly R.)		15.99			11.32					13.65	2
229/Clady		16.12				37.21				26.67	2
234/Glenna			16.80		3.77		7.77			9.45	3
235/Tullaghobegly		8.33		9.05						8.69	2
236/Ray		6.43			14.89			17.31		12.88	3
240/Lackagh		18.86	15.82		19.20	23.57				19.36	4
248/Leannan	9.47	7.41	8.73	16.71	12.36	21.51	19.51	20.87	15.27	17.90	5
249/Swilly		9.33	7.36				18.08	8.05		10.71	4
250/Isle (Burn)						2.12				2.12	1
251/Burnfoot		7.77		2.90						5.33	2
252/Mill (Letterkenny)				0.00					0.00	0.00	2
253/Crana			15.74							15.74	1
256/Clonmany		16.61		6.59					4.21	9.14	3
257/Straid				0.20					0.00	0.10	2
258/Donagh				4.25					0.68	2.46	2
259/Glennagannon			16.65		4.05		7.13			9.28	3
261/Culoort				4.03					0.00	2.02	2

Table A.7.1.1: Catchment-wide Electrofishing data for NWRBD 2007- 2015 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

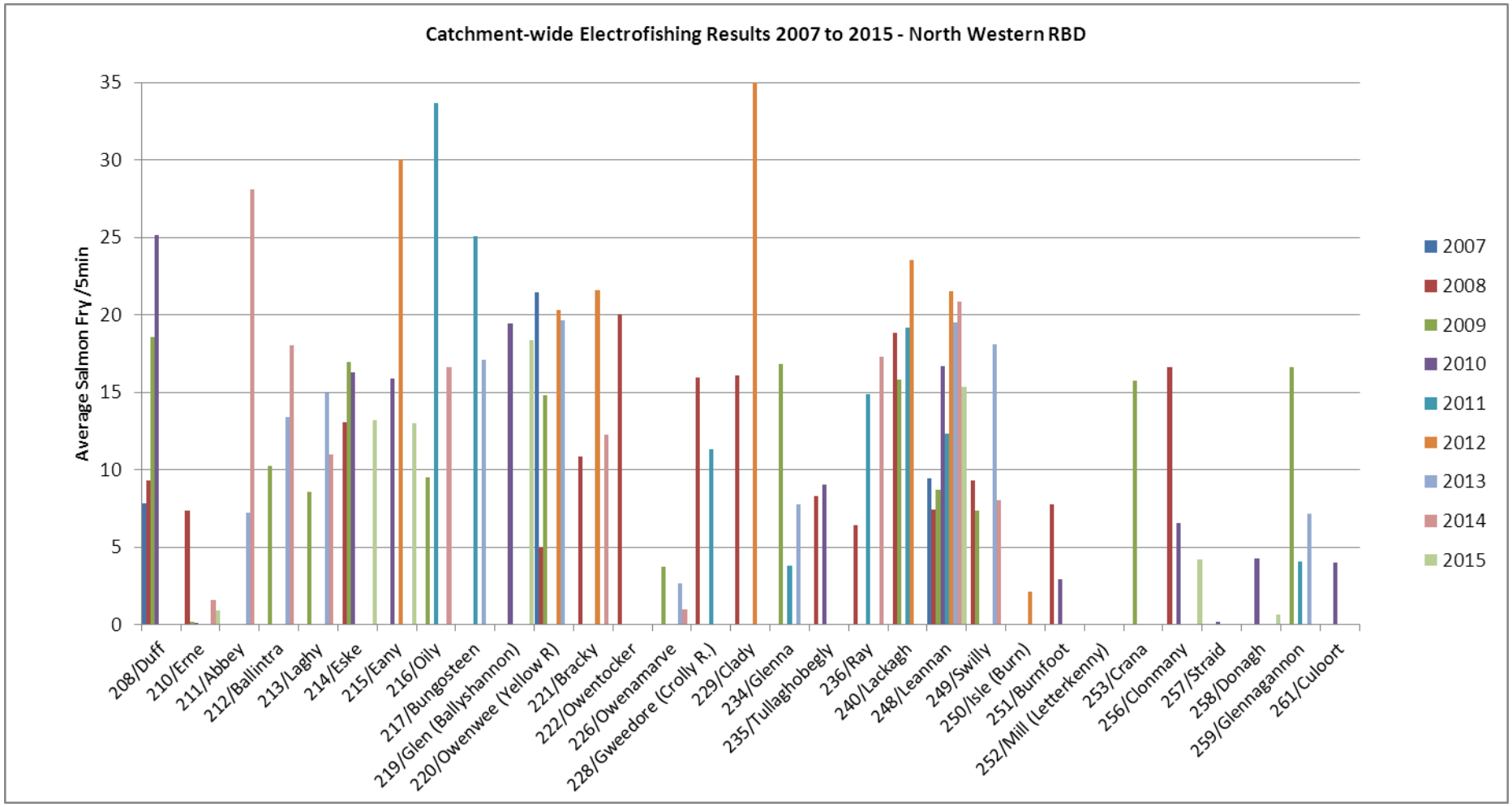


Chart A.7.1: Summary of CWEF results in NWRFB from 2007 to 2015.

A.7.2 River Erne

IFI Salmon Catchment #: 210
2015 survey dates: 14/8/2015 – 18/9/2015
Mean Salmon Fry/5 min (2015): 1.16 fry/5min.
CWEF Index: 0.55 fry/5min.

Sampling carried out by:

Frank Greene
Kevin Murphy
Val Fitzpatrick
Paul Gallagher
Ollie Conlon

Fish Species Present:

Salmon
Brown Trout
European Eel
Minnow
Gudgeon
Margaritifera
Pike
Roach

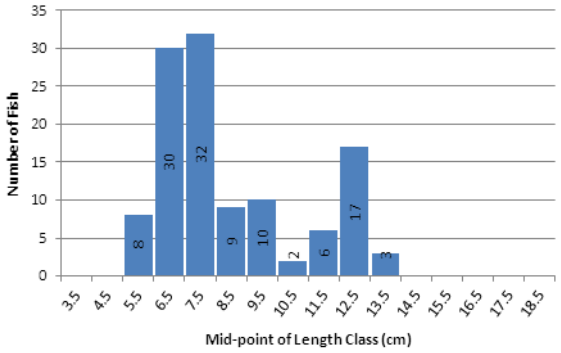


Figure A.7.2.1: Length distribution of salmon captured in 2015 CWEF survey on the Erne Catchment.

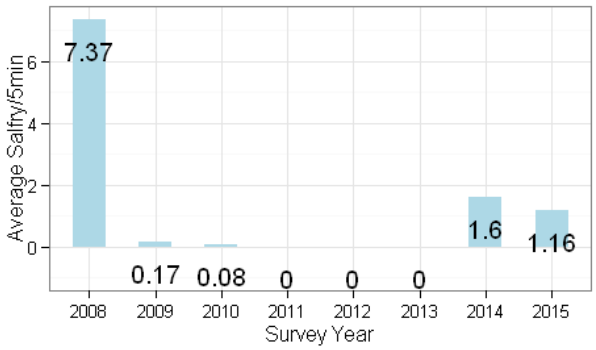


Figure A.7.2.2: Comparison of mean salfry/5 min for all surveys on the Erne catchment to 2015.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2007	2008			Closed	7.37	
2008	2009			Closed	0.17	
2009	2010			Closed	0.08	
2010	2011			Closed	0.00	
2011	2012			Closed	0.00	
2012	2013			Closed	0.00	
2013	2014	16554	-14692	Closed	1.60	
2014	201	16586	-14823	Closed	1.16	0.55

Table A.7.2.1: Conservation limits and provisional returns on the Erne catchment along with the 2015 CWEF fishing result.

This regular partial survey, the eighth of this catchment in the 2007 to 2015 period, was carried out from July to September 2015. Surveys were undertaken on 7 tributaries within the system and comprised 73 sites, 71 of which were included in the analysis. Salmon fry were found in 5 of the tributaries and were present at 14 sites. The Waterfoot River had the greatest numbers of salmon; the maximum fry catch was 18 salmon at site 103. Three sites on the Termon had salmon fry; the best site had 8 fry. Only one salmon fry was found on the Aghacashlaun. 3 sites on the Swanlinbar had salmon; the best site had 8 fry. Two sites on the Glenfarne had salmon; the best site produced 5 fry. No salmon fry were found on either the Ominey or Blackwater rivers. The mean catch of included sites overall was 1.16 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 7.5cm.

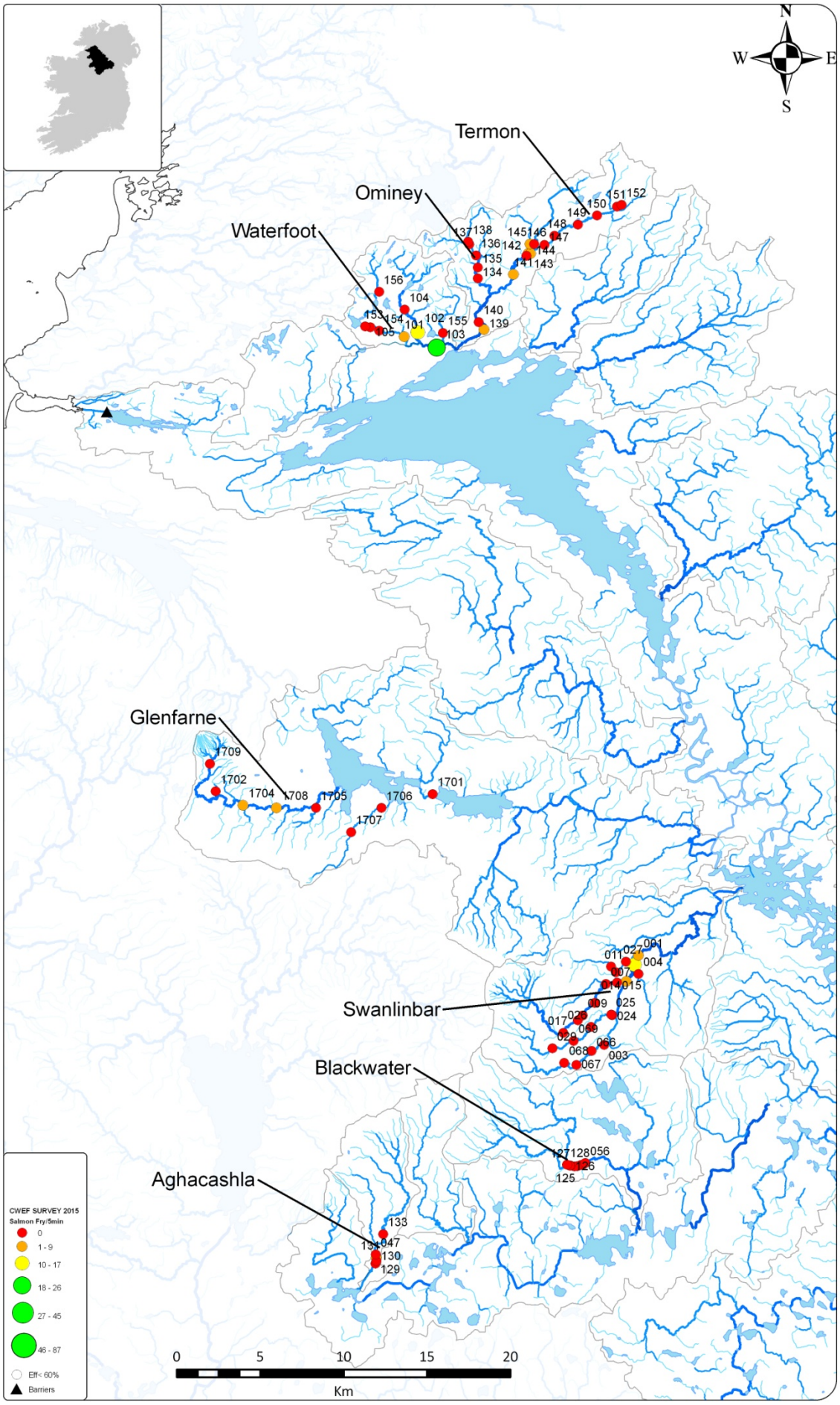
Conclusion

The Erne had a mean catch of 1.16 salfry/5min in 2015 resulting in a combined annual average of 0.55 salmon fry/5min; this is well below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min	Sub Catchment
101	206599	365753	1	1	Include	1	Waterfoot
102	207401	366037	1	11	Include	13	Waterfoot
103	208535	365135	1	18	Include	19.89	Waterfoot
104	206617	367402	2	0	Include	0	Waterfoot
105	204567	366343	1	0	Include	0	Waterfoot
153	204256	366392	2	0	Include	0	Waterfoot
154	205099	366137	2	0	Include	0	Waterfoot
155	208910	366001	1	0	Include	0	Waterfoot
156	205091	368458	3	0	Include	0	Waterfoot
134	210998	369268	1	0	Include	0	Ominey
135	210998	369927	1	0	Include	0	Ominey
136	210900	370645	2	0	Include	0	Ominey
137	210482	371312	2	0	Include	0	Ominey
138	210413	371456	2	0	Include	0	Ominey
157	211447	368899	3	0	Include	0	Ominey
139	211374	366197	2	3	Include	3	Termon
140	211055	366651	1	0	Include	0	Termon
141	213139	369486	3	2	Include	2.5	Termon
142	213906	370621	1	0	Include	0	Termon
143	214040	370746	1	8	Include	8.42	Termon
144	214167	370746	1	6	Include	6	Termon
145	214130	371303	1	3	Include	3	Termon
146	214381	371324	1	0	Include	0	Termon
147	214990	371273	3	0	Include	0	Termon
148	215584	371828	1	0	Include	0	Termon
149	216997	372496	3	0	Include	0	Termon
150	218137	373031	2	0	Include	0	Termon
151	219339	373568	1	0	Include	0	Termon
152	219618	373677	1	0	Include	0	Termon
47	204890	310815	1	0	Include	0	Aghacashlaun
129	204877	310265	1	0	Include	0	Aghacashlaun
130	204926	310428	1	0	Include	0	Aghacashlaun
131	204923	310611	1	1	Include	1	Aghacashlaun
56	217441	316289	2	0	Include	0	Blackwater
122	217293	316197	2	0	Include	0	Blackwater
123	217191	316177	2	0	Include	0	Blackwater
124	216968	316105	2	0	Include	0	Blackwater
125	216787	316084	2	0	Include	0	Blackwater
126	216558	316140	2	0	Include	0	Blackwater
127	216503	316144	2	0	Include	0	Blackwater
128	216348	316190	2	0	Include	0	Blackwater
1	220618	328716	1	2	Include	3.2	Swanlinbar
3	218566	323374	3	0	Include	0	Swanlinbar
4	220627	327620	3	0	Include	0	Swanlinbar
7	218675	327016	3	0	Include	0	Swanlinbar
8	217998	325889	3	0	Include	0	Swanlinbar
9	217283	325132	3	0	Include	0	Swanlinbar
10	219270	327713	3	0	Include	0	Swanlinbar
11	218983	328057	3	0	Include	0	Swanlinbar
13	220392	328156	3	8	Include	11.56	Swanlinbar
14	219907	327154	2	3	Include	3	Swanlinbar
15	219344	327106	3	0	Include	0	Swanlinbar
16	216989	324839	3	0	Include	0	Swanlinbar
17	216128	324088	3	0	Include	0	Swanlinbar
23	219648	326787	3	0	Too high, unfishable		Swanlinbar
24	219055	325147	3	0	Include	0	Swanlinbar

Site Number	X	Y	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min	Sub Catchment
25	218993	325188	3	0	Include	0	Swanlinbar
26	217779	324445	3	0	Include	0	Swanlinbar
27	219877	328355	3	0	Include	0	Swanlinbar
28	218647	327625	2	0	Stream order<2		Swanlinbar
29	215467	323163	3	0	Include	0	Swanlinbar
66	217823	323003	3	0	Include	0	Swanlinbar
67	216911	322178	3	0	Include	0	Swanlinbar
68	216170	322296	3	0	Include	0	Swanlinbar
69	216739	323613	2	0	Include	0	Swanlinbar
1701	208302	338386	2	0	Include	0	Glenfarne
1702	195300	338550	2	0	Include	0	Glenfarne
1704	196948	337701	3	5	Include	5	Glenfarne
1705	201308	337557	2	0	Include	0	Glenfarne
1706	205233	337557	3	0	Include	0	Glenfarne
1707	203411	336111	2	0	Include	0	Glenfarne
1708	198954	337549	3	2	Include	2	Glenfarne
1709	194956	340199	2	0	Include	0	Glenfarne

Table A.7.2.3: Site specific results of CWEF on the Erne catchment in 2015.



Map A.7.2.1: CWEF survey site locations on the Erne System.

A.7.3 The Eske River .

IFI Salmon Catchment #: 214
2015 survey dates: 22/6/2015- 16/8/2015
Mean Salmon Fry/5 min (2015): 13.45 fry/5min.
CWEF Index: 14.96 fry/5min.

Sampling carried out by:

Ollie Conlon
Paul Gallagher

Fish Species Present:

Brown Trout
European Eel
Salmon

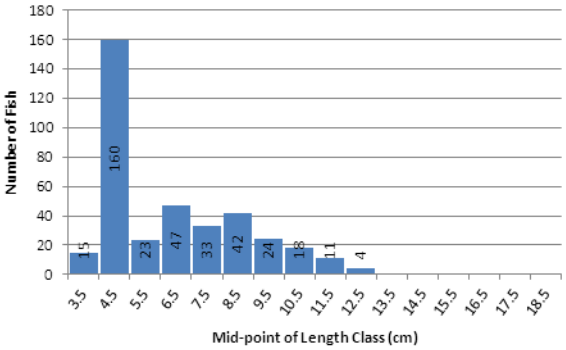


Figure A.7.3.1: Length distribution of salmon captured in 2015 CWEF survey on the Eske Catchment.

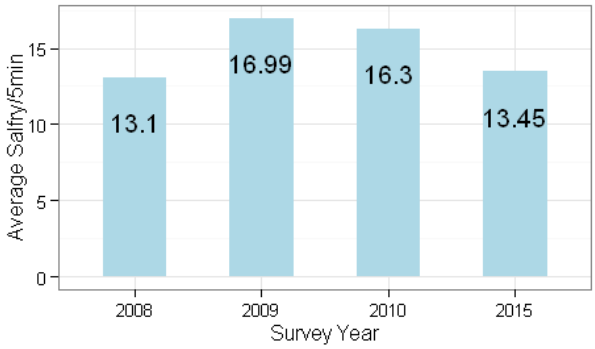


Figure A.7.3.2: Comparison of mean salfry/5 min for all surveys on the Eske catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2008	14					8.27
2009	14	2				7.24
2010	17					6.81
2015	23					5.03

Table A.7.3.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	823	38	Open	16.30	
2010	2011	823	-124	Open		
2011	2012	823	118	Open		
2012	2013	823	260	Brown Tag		
2013	2014	601	99	Brown Tag		
2014	2015	731	45	Brown Tag	13.45	14.96

Table A.7.3.2: Conservation limits and provisional returns on the Eske catchment along with the 2015 CWEF fishing result.

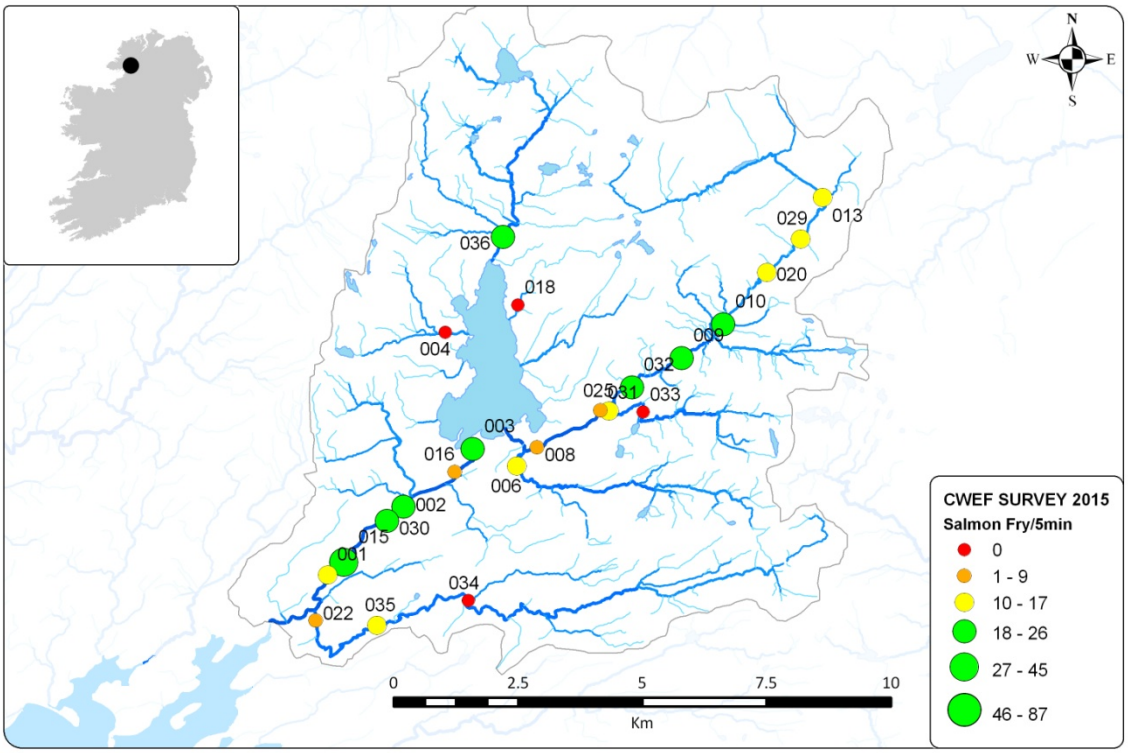
This survey, the fourth of this catchment in the 2007 to 2015 period, was carried out from July to September 2015. The survey comprised 23 sites, all of which were included in the analysis giving coverage of 5.03 km per survey site. Salmon fry were present at 19 sites. The maximum fry catch was 30 salmon at site 15. The mean catch of included sites was 13.45 salmon fry/5min. The modal length category of 0+ fry caught was 4.5cm.

Conclusion

The Eske had a mean catch of 13.45 salfry/5min in 2015 resulting in a combined annual average of 14.96 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	193998	379498	5	1	14	Include	16
2	195525	380871	5	1	21	Include	25.57
3	196914	382030	5	1	19	Include	22
4	196369	384373	3	2	0	Include	0
6	197806	381687	4	1	15	Include	17
8	198218	382059	5	2	9	Include	9
9	201119	383857	4	1	20	Include	22
10	201957	384535	3	1	20	Include	22
13	203957	387080	3	3	10	Include	11
15	194326	379755	5	1	30	Include	33
16	196564	381560	5	3	8	Include	9
18	197828	384924	2	1	0	Include	0
20	202836	385571	3	1	11	Include	13
22	193761	378577	4	2	1	Include	1
25	199659	382787	4	1	12	Include	13
29	203519	386249	3	2	13	Include	17
30	195206	380577	5	1	19	Include	22
31	199486	382800	6	1	8	Include	8.47
32	200121	383268	4	2	16	Include	18
33	200349	382772	3	2	0	Include	0
34	196832	378986	3	1	0	Include	0
35	194991	378484	4	1	10	Include	11.43
36	197526	386294	3	1	17	Include	19

Table A.7.3.3: Site specific results of CWEF on the Eske catchment in 2015.



Map A.7.3.1: CWEF survey site locations 2015 on the Eske River.

A.7.4 The Eany River

IFI Salmon Catchment #: 215
2015 survey dates: 18/8/2015- 16/9/2015
Mean Salmon Fry/5 min (2015): 12.89 fry/5min.
CWEF Index: 19.61 fry/5min.

Sampling carried out by:

Paul Gallagher
Ollie Conlon

Fish Species Present:

Brown Trout
European Eel
Salmon

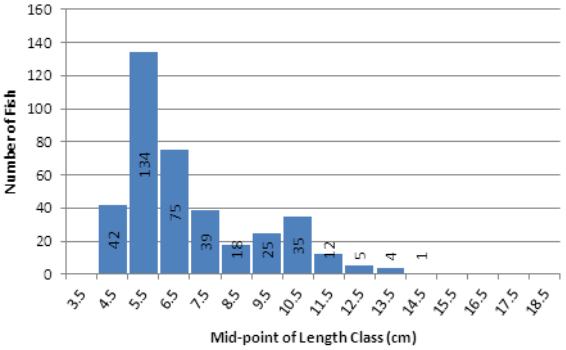


Figure A.7.4.1: Length distribution of salmon captured in 2015 CWEF survey on the Eany Catchment.

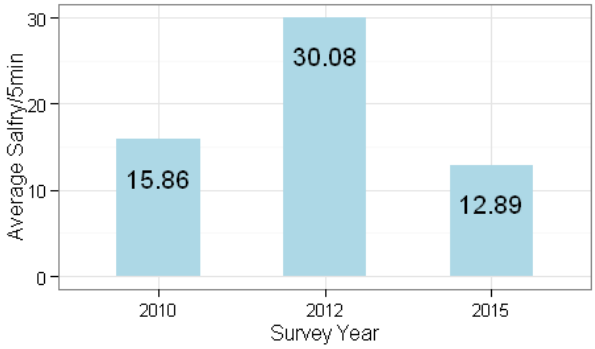


Figure A.7.4.2: Comparison of mean salfry/5 min for all surveys on the Eany catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2010	30					4.80
2012	21					6.86
2015	25					5.76

Table A.7.4.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	1740	807	Open	15.86	
2010	2011	1740	283	Open		
2011	2012	1740	194	Open	30.08	
2012	2013	1740	652	Open		
2013	2014	1316	326	Open		
2014	2015	1312	135	Brown Tag	12.89	19.61

Table A.7.4.2: Conservation limits and provisional returns on the Eany catchment along with the 2015 CWEF fishing result.

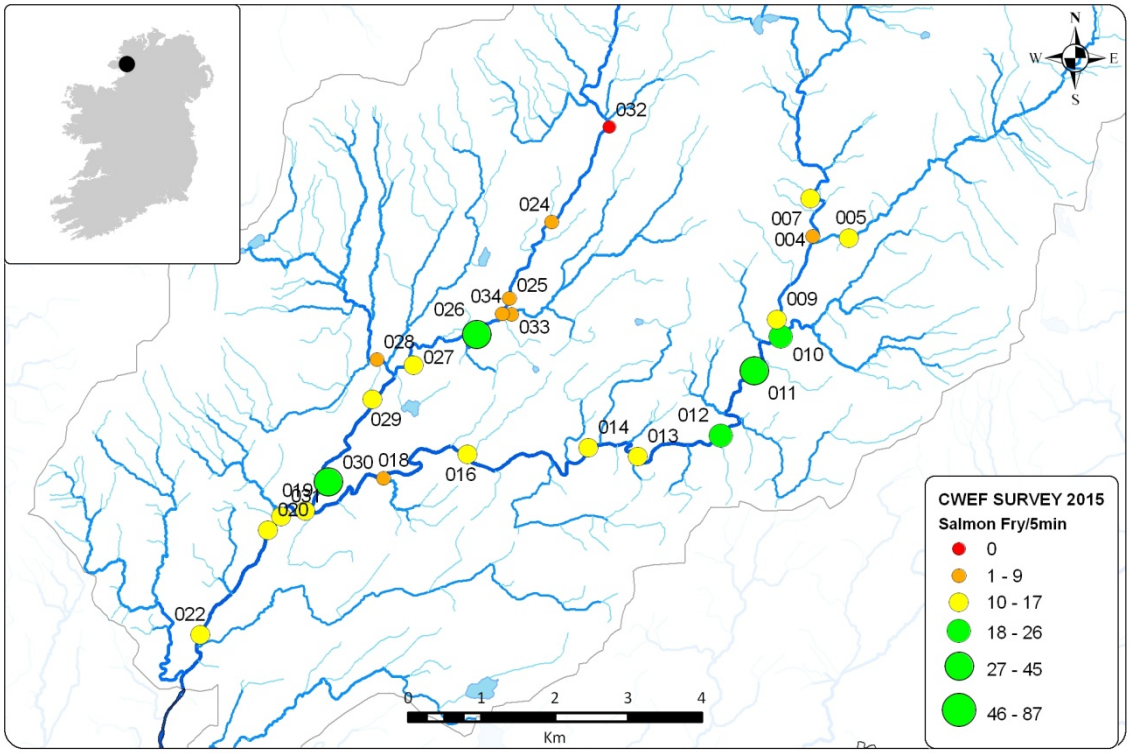
This survey, the third of this catchment in the 2007 to 2015 period, was carried out during August and September 2015. The survey comprised 25 sites, all of which were included in the analysis giving coverage of 5.76 km per survey site. Salmon fry were present at all but one site. The maximum fry catch was 31 salmon at site 26. The mean catch of included sites was 12.89 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 5.5cm.

Conclusion

The Eany had a mean catch of 12.89 salfry/5min in 2015 resulting in a combined annual average of 19.61 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
4	191042	385186	4	1	6	Include	6.86
5	191538	385164	3	2	9	Include	10.8
7	191012	385708	4	2	9	Include	9.9
9	190552	384060	4	1	12	Include	14
10	190609	383823	4	1	24	Include	24
11	190235	383351	5	1	23	Include	26
12	189789	382475	5	1	16	Include	17.88
13	188655	382188	5	1	15	Include	17
14	187983	382310	5	1	12	Include	14
16	186332	382219	5	2	10	Include	11
18	185183	381894	5	2	3	Include	3
19	184124	381445	5	1	11	Include	11
20	183615	381186	6	1	14	Include	16.8
22	182694	379763	6	1	11	Include	14
24	187478	385381	4	2	5	Include	5.83
25	186905	384341	4	3	5	Include	6
26	186457	383849	4	1	31	Include	31.97
27	185601	383433	4	1	10	Include	12
28	185096	383507	4	3	6	Include	6.86
29	185034	382966	5	2	9	Include	9.9
30	184432	381836	5	1	30	Include	32
31	183791	381370		1	11	Include	13
32	188266	386676		2	0	Include	0
33	186934	384127		2	7	Include	7.78
34	186806	384127		2	1	Include	1

Table A.7.4.3: Site specific results of CWEF on the Eany catchment in 2015.



Map A.7.4.1: CWEF survey site locations 2015 on the Eany River.

A.7.5 The Glen River

IFI Salmon Catchment #: 219
2015 survey dates: 29/7/2015 - 30/9/2015
Mean Salmon Fry/5 min (2015): 18.37 fry/5min.
CWEF Index: 18.91 fry/5min.

Sampling carried out by:

Paul Gallagher
Dara Timpson

Fish Species Present:

Brown Trout
European Eel
Salmon

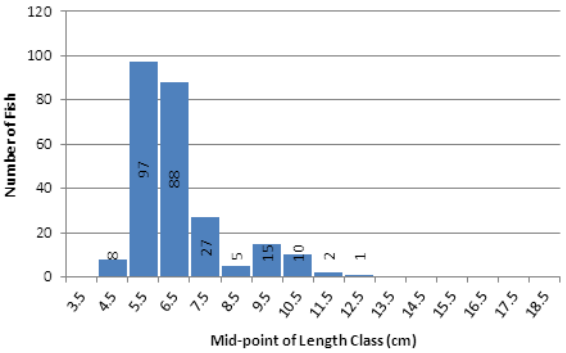


Figure A.7.4.1: Length distribution of salmon captured in 2015 CWEF survey on the Glen Catchment.

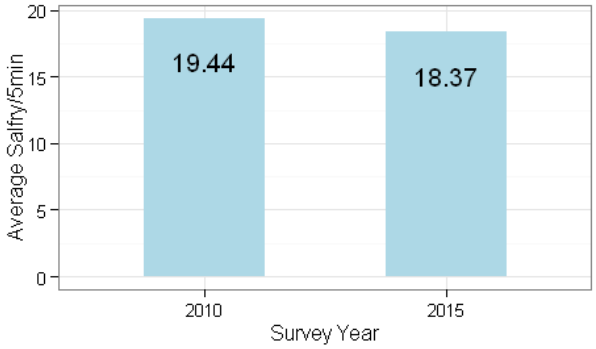


Figure A.7.4.2: Comparison of mean salfry/5 min for all surveys on the Glen catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2010	18					4.56
2015	14					5.86

Table A.7.5.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	957	809	Open	19.44	
2010	2011	957	256	Open		
2011	2012	957	558	Open		
2012	2013	957	505	Open		
2013	2014	1017	351	Open		
2014	2015	1196	224	Open	18.37	18.91

Table A.7.5.2: Conservation limits and provisional returns on the Glen catchment along with the 2015 CWEF fishing result.

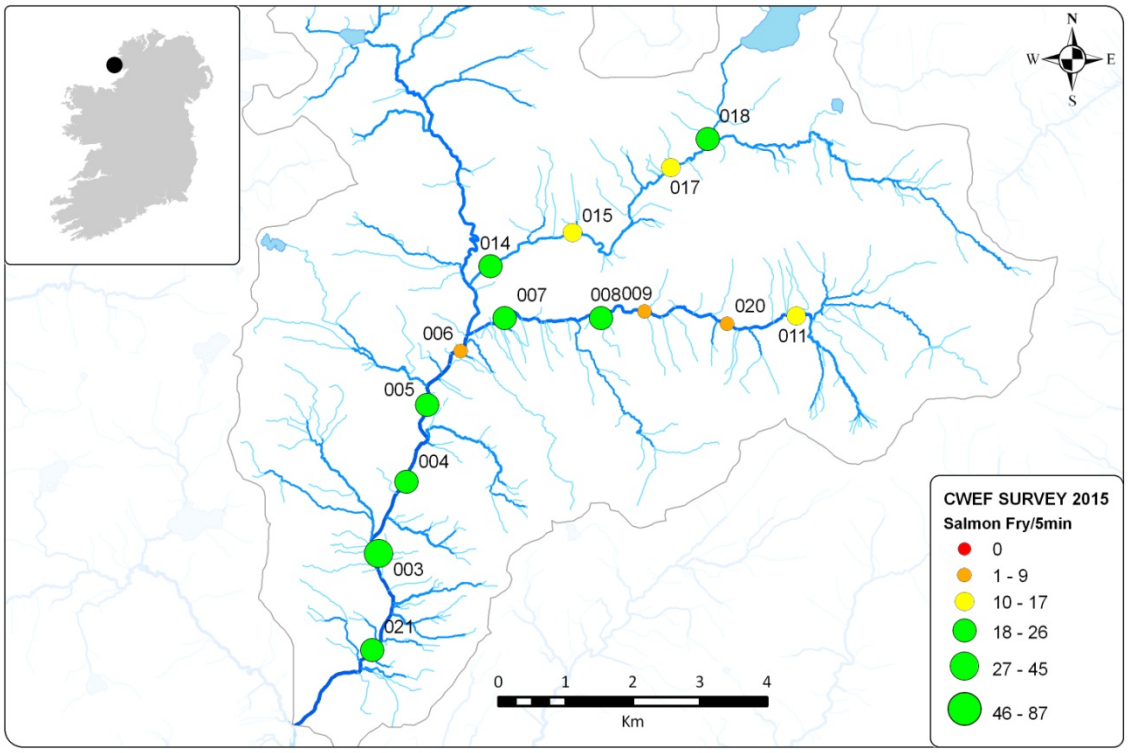
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during September 2015. The survey comprised 14 sites, all of which were included in the analysis giving coverage of 5.86 km per survey site. Salmon fry were present at all sites. The maximum fry catch was 35 salmon at site 3. The mean catch of included sites was 18.37 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 5.5cm.

Conclusion

The Glen had a mean catch of 18.37 salfry/5min in 2015 resulting in a combined annual average of 18.91 salmon fry/5min; this is above the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
3	159782	380749	5	1	35	Include	39.27
4	160197	381821	5	1	20	Include	22.5
5	160503	382964	5	1	18	Include	22
6	161005	383761	5	2	7	Include	7
7	161659	384258	4	2	19	Include	21.19
8	163096	384260	4	2	19	Include	22
9	163749	384349	4	2	8	Include	9
11	166006	384287	4	2	8	Include	10
14	161449	385029	3	1	23	Include	25.88
15	162673	385530	3	2	11	Include	11.85
17	164136	386495	3	2	11	Include	13
18	164683	386923		1	21	Include	24
20	164980	384168		2	6	Include	6.67
21	159683	379317			19	Include	22.8

Table A.7.5.3: Site specific results of CWEF on the Glen catchment in 2015.



Map A.7.5.1: CWEF survey site locations 2015 on the Glen River.

A.7.6 The Mill River (Letterkenny).

IFI Salmon Catchment #: 252
2015 survey dates: 28/9/2015
Mean Salmon Fry/5 min (2015): 0 fry/5min.
CWEF Index: 0 fry/5min.

Sampling carried out by:

Cornelius McMullan
James Doherty

Fish Species Present:

Brown Trout
European Eel

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2010	3					9.73
2015	3					9.73

Table A.7.6.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	271	-114	Closed	0.00	
2010	2011	271	-114	Closed		
2011	2012	271	-114	Closed		
2012	2013	271	-114	Closed		
2013	2014	312	-186	Closed		
2014	2015	311	-185	Closed	0.00	0.00

Table A.7.6.2: Conservation limits and provisional returns on the Mill catchment along with the 2015 CWEF fishing result.

This survey, the second of this catchment in the 2007 to 2015 period, was carried out on 28 Sept 2015. The survey comprised 3 sites, all of which were included in the analysis giving coverage of 9.73 km per survey site. Salmon fry and parr were absent from all sites.

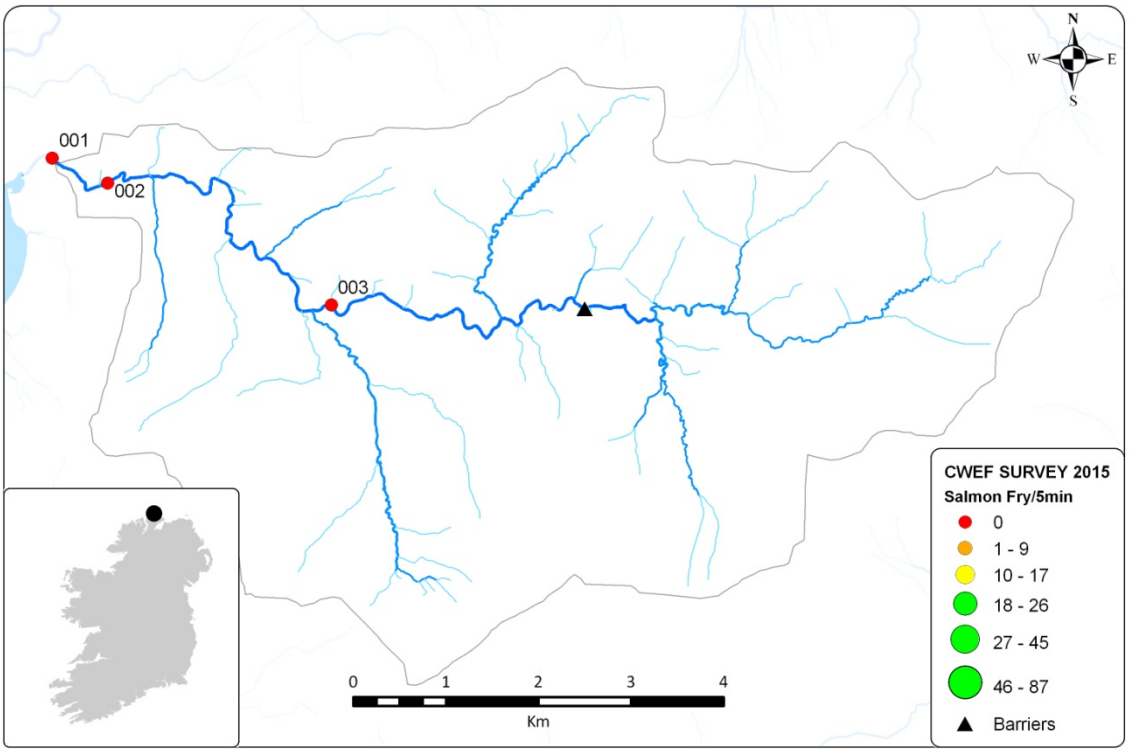
Water quality was last assessed by the EPA at one site on the main channel just upstream of site 1 of the CWEF survey on this river in 2013. The Q value was found to be 3-4, (on a scale of 1-grossly polluted to 5-pristine unpolluted) indicating slight pollution that might cause risk to salmonid fish. This catchment has 9.1 ha of river accessible to salmon (McGinnity et al., 2012), comprising about 0.07% of the national salmonid riverine habitat.

Conclusion

Neither of the annual surveys conducted on the Mill encountered any salmon fry.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Sal Parr Captured	Trout Fry Captured	Trout Fry Captured	Site Status	SalFry/5min
1	234943.88	431660.94	4	3	0	0	2	1	Include	0
2	235543.25	431391.72	4	3	0	0	4	1	Include	0
3	237961.54	430070.8	4	3	0	0	0	11	Include	0

Table A.7.6.3: Site specific results of CWEF on the Mill catchment in 2015.



Map A.7.6.1: CWEF survey site locations 2015 on the Mill River.

A.7.7 The Leannan River

IFI Salmon Catchment #: 248
2015 survey dates: 16/7/2015– 30/9/2015
Mean Salmon Fry/5 min (2015): 15.27 fry/5min.
CWEF Index: 17.90 fry/5min.

Sampling carried out by:

Cornelius McMullan
Gabriel Timoney
James Doherty
Tony Holmes

Fish Species Present:

Brown Trout
Salmon

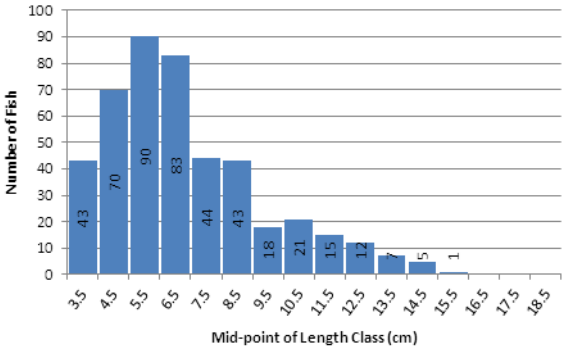


Figure A.7.7.1: Length distribution of salmon captured in 2015 CWEF survey on the Leannan Catchment.

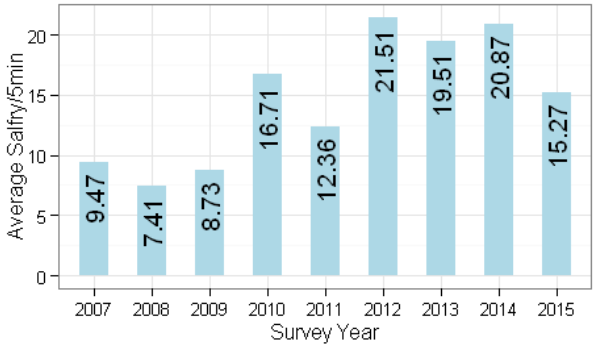


Figure A.7.7.2: Comparison of mean salfry/5 min for all surveys on the Leannan catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2011	28	1				7.55
2012	28				1	7.55
2013	26					8.42
2014	26					8.42
2015	25	1				8.42

Table A.7.7.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	3618	-2619	Closed	16.71	
2010	2011	3618	-2609	Closed	12.36	
2011	2012	3618	-2612	Closed	21.51	
2012	2013	3618	-2612	Closed	19.51	
2013	2014	516	-410	Closed	20.87	
2014	2015	516	-409	Closed	15.27	17.90

Table A.7.7.2: Conservation limits and provisional returns on the Leannan catchment along with the 2015 CWEF fishing result.

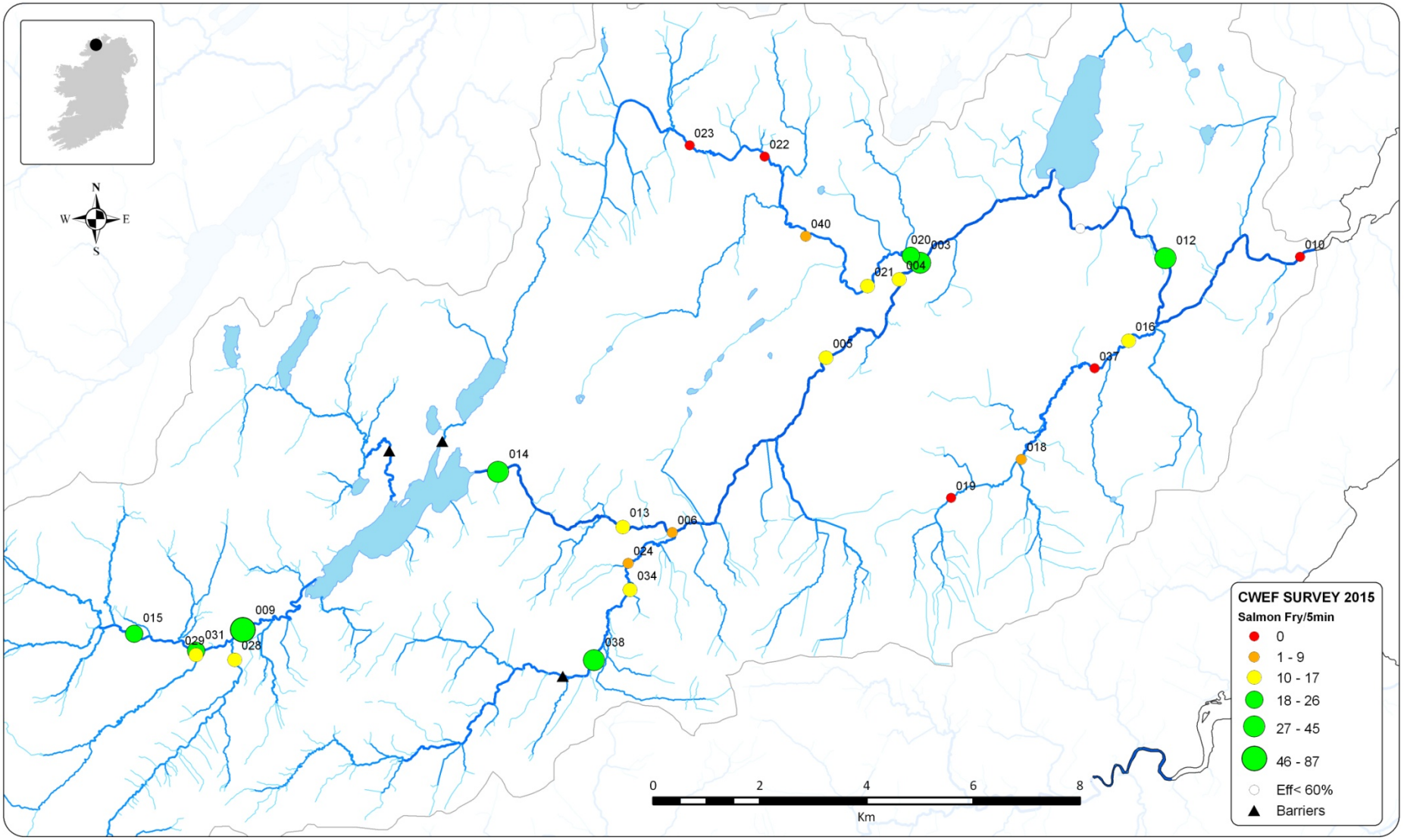
This survey, the ninth of this catchment in the 2007 to 2015 period, was carried out from July to Sept 2015. The survey comprised 26 sites, all but one were included in the analysis giving a coverage of 8.42 km per survey site. Salmon fry were present at 21 sites. The maximum fry catch was 47 salmon at site 9. The mean catch of included sites was 15.35 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 5.5cm.

Conclusion

The Leannan had a mean catch of 15.27 salfry/5min in 2015 resulting in a combined annual average of 17.90 salmon fry/5min; this is above the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
2	218110.54	421555.29	5	3	4	Efficiency below 60%	
3	215115.19	420910.55	5	1	31	Include	37.78
4	214722.51	420597.69	5	1	11	Include	16.5
5	213349.41	419129.46	5	3	13	Include	13
6	210471	415850.96	5	1	9	Include	9
9	202422.47	414028.32	4	1	47	Include	51
10	222234.86	421028.98	5	2	0	Include	0
12	219710.42	421001.21	5	1	25	Include	29.81
13	209540.41	415957.5	5	3	8	Include	13
14	207206.36	416991.39	5	1	23	Include	35
15	200385.16	413956.29	4	2	14	Include	17.5
16	219019.68	419448.33	4	3	9	Include	10.57
18	217013.65	417222.4	4	1	1	Include	1
19	215696.31	416505.18	3	2	0	Include	0
20	214938.01	421045.51	4	1	25	Include	25
21	214125.83	420475.25	4	2	16	Include	16
22	212199.02	422907.9	4	2	0	Include	0
23	210793.42	423117.23	4	2	0	Include	0
24	209643.4	415275.12	4	1	3	Include	3.9
28	202269.26	413466.43	3	1	15	Include	16.88
29	201542.59	413558.63	3	1	14	Include	16.21
31	201544.17	413637.21	4	1	24	Include	24
34	209680.32	414776.85	4	3	8	Include	13
37	218382.99	418934.18	4	3	0	Include	0
38	209004.33	413462.72	4	2	23	Include	28.31
40	212972.97	421411.55	4	3	3	Include	4.29

Table A.7.7.3: Site specific results of CWEF on the Leannan catchment in 2015.



Map A.7.7.1: CWEF site survey locations 2015 on the Leannan River.

A.7.8 The Clonmany River

IFI Salmon Catchment #: 256
2015 survey dates: 18/9/2015 - 29/9/2015
Mean Salmon Fry/5 min (2015): 4.21 fry/5min.
CWEF Index: 9.14 fry/5min.

Sampling carried out by:

Cornelius McMullan
Gabriel Timoney
James Doherty

Fish Species Present:

Brown Trout
Salmon

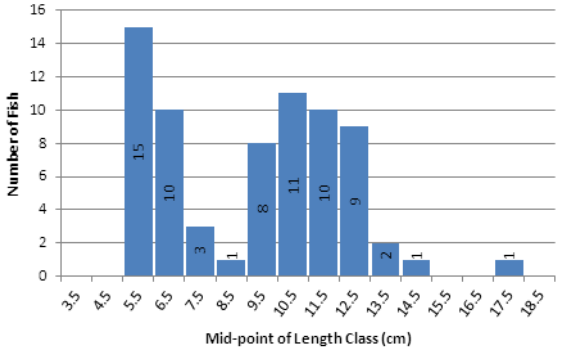


Figure A.7.8.1: Length distribution of salmon captured in 2015 CWEF survey on the Clonmany Catchment.

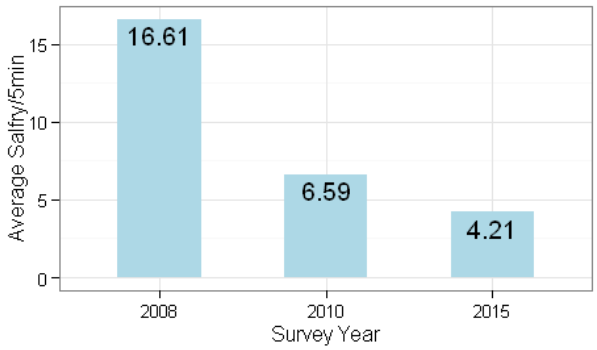


Figure A.7.8.2: Comparison of mean salfry/5 min for all surveys on the Clonmany catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2008	4					8.83
2010	12					2.94
2015	7	2				3.92

Table A.7.8.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	465	-195	Closed	6.59	
2010	2011	465	-195	Closed		
2011	2012	465	-195	Closed		
2012	2013	465	-195	Closed		
2013	2014	442	-243	Closed		
2014	2015	442	-244	Closed	4.21	9.14

Table A.7.8.2: Conservation limits and provisional returns on the Clonmany catchment along with the 2015 CWEF fishing result.

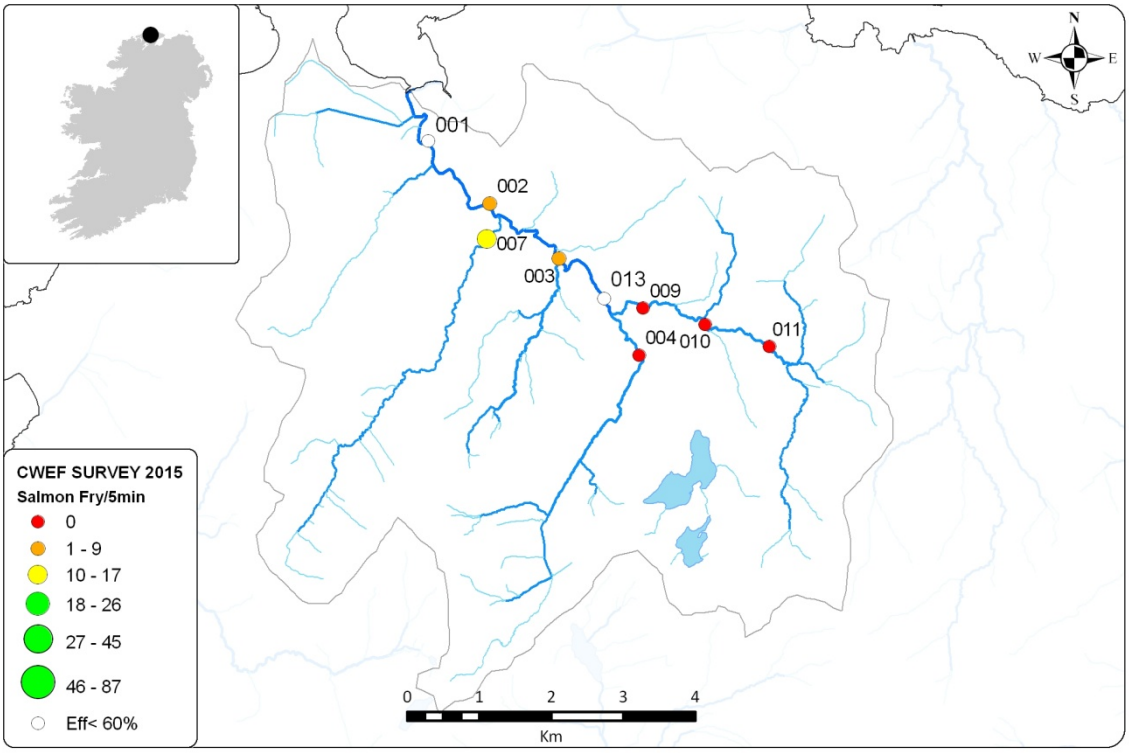
This survey, the third of this catchment in the 2007 to 2015 period, was carried out during September 2015. The survey comprised 9 sites, 7 of which were included in the analysis giving a good coverage of 3.92 km per survey site. Salmon fry were present at 5 sites. The maximum fry catch was 13 salmon at site 7. The mean catch of included sites was 4.21 salmon fry/5min. The modal length category of 0+ fry caught was 5.5cm.

Conclusion

The Clonmany had a mean catch of 4.12 salfry/5min in 2015 resulting in a combined annual average of 9.14 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
1	236111.64	447419.24	4	2	4	Efficiency below 60%	
2	236967.77	446545.99	4	3	5	Include	7.5
3	237925.66	445783.13	4	3	5	Include	7
4	239039.07	444440.11	3	2	0	Include	0
7	236929.73	446054.55	2	2	13	Include	14.95
9	239098.21	445094.11	3	3	0	Include	0
10	239954.4	444867.62	3	3	0	Include	0
11	240848.72	444559.14	3	3	0	Include	0
13	238552.35	445227.32	4	3	1	Efficiency below 60%	

Table A.7.8.3: Site specific results of CWEF on the Clonmany catchment in 2015.



Map A.7.8.1: CWEF site survey locations 2015 on the Clonmany River.

A.7.9 The Straid River.

IFI Salmon Catchment #: 257
2015 survey dates: 28/9/2015 - 29/9/2015
Mean Salmon Fry/5 min (2015): 0 fry/5min.
CWEF Index: 0.1 fry/5min.

Sampling carried out by:

Cornelius McMullan
James Doherty

Fish Species Present:

Brown Trout
European Eel

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2010	5					4.51
2015	5					4.51

Table A.7.9.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	196	-82	Closed	6.59	
2010	2011	196	-82	Closed		
2011	2012	196	-82	Closed		
2012	2013	196	-82	Closed		
2013	2014	184	-101	Closed		
2014	2015	184	-101	Closed	4.21	9.14

Table A.7.9.2: Conservation limits and provisional returns on the Straid catchment along with the 2015 CWEF fishing result.

This survey, the second of this catchment in the 2007 to 2015 period, was carried out during September 2015. The survey comprised 5 sites, all of which were included in the analysis giving a good coverage of 4.51 km per survey site. Salmon fry and parr were absent from all sites. The previous survey on this catchment visited the same sites and found only one fry and one parr, both at site 1.

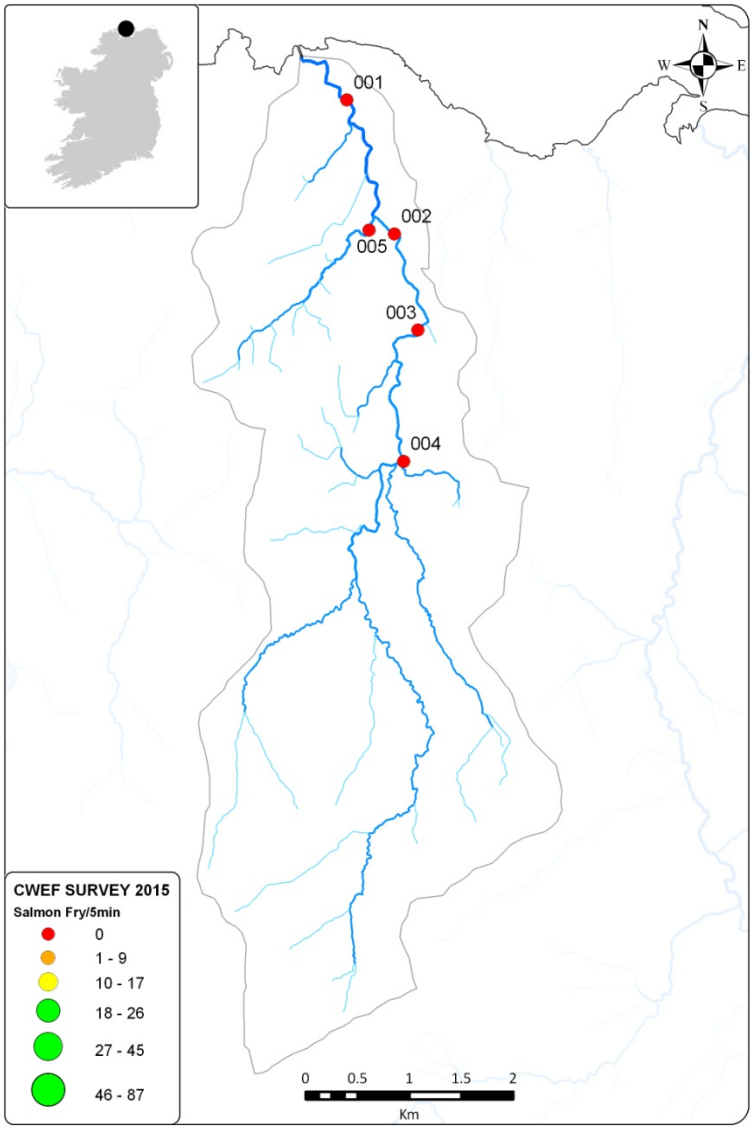
Water quality was last assessed by the EPA at one site on the main channel on this river in 2013. The Q value was found to be 4, (on a scale of 1-grossly polluted to 5-pristine unpolluted) indicating good water quality. This catchment has 7.3 ha of river accessible to salmon (McGinnity et al., 2012), comprising about 0.06% of the national salmonid riverine habitat.

Conclusion

The Straid had a mean catch of zero salfry/5min in 2015 resulting in a combined annual average of 0.1 salmon fry/5min; this is below the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Sal Parr Captured	Trout Fry Captured	Trout Parr Captured	Site Status	SalFry/5min
1	243300	448382	4	1	0	0	3	9	Include	0
2	243759	447093	3	3	0	0	1	12	Include	0
3	243984	446166	3	3	0	0	3	7	Include	0
4	243847	444902	3	2	0	0	6	18	Include	0
5	243515	447130	3	2	0	0	12	1	Include	0

Table A.7.9.3: Site specific results of CWEF on the Straid catchment in 2015.



Map A.7.9.1: CWEF site survey locations 2015 on the Straid River.

A.7.10 The Donagh River

IFI Salmon Catchment #: 258
2015 survey dates: 8/9/2015 - 29/9/2015
Mean Salmon Fry/5 min (2015): 0.68 fry/5min.
CWEF Index: 2.46 fry/5min.

Sampling carried out by:

Cornelius McMullan
Gabriel Timoney
James Doherty

Fish Species Present:

Brown Trout
Sea Trout
European Eel
Flounder
Salmon

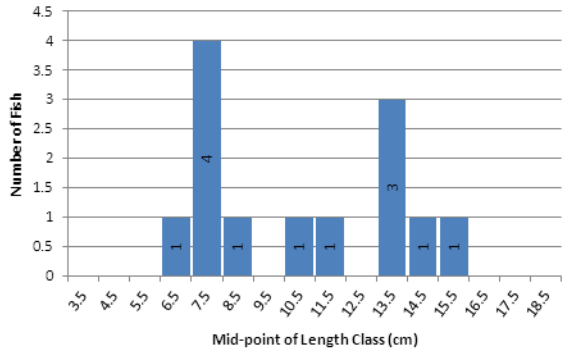


Figure A.7.10.1: Length distribution of salmon captured in 2015 CWEF survey on the Donagh Catchment.

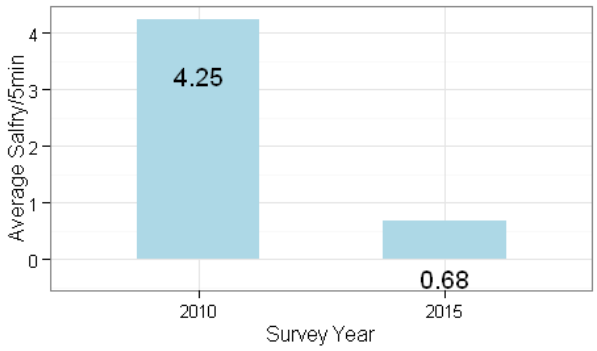


Figure A.7.10.2: Comparison of mean salfry/5 min for all surveys on the Donagh catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2010	10					3.07
2015	8	1				3.41

Table A.7.10.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	418	-176	Closed	4.25	
2010	2011	418	-176	Closed		
2011	2012	418	-176	Closed		
2012	2013	418	-176	Closed		
2013	2014	427	-244	Closed		
2014	2015	429	-246	Closed	0.68	2.46

Table A.7.10.2: Conservation limits and provisional returns on the Donagh catchment along with the 2015 CWEF fishing result.

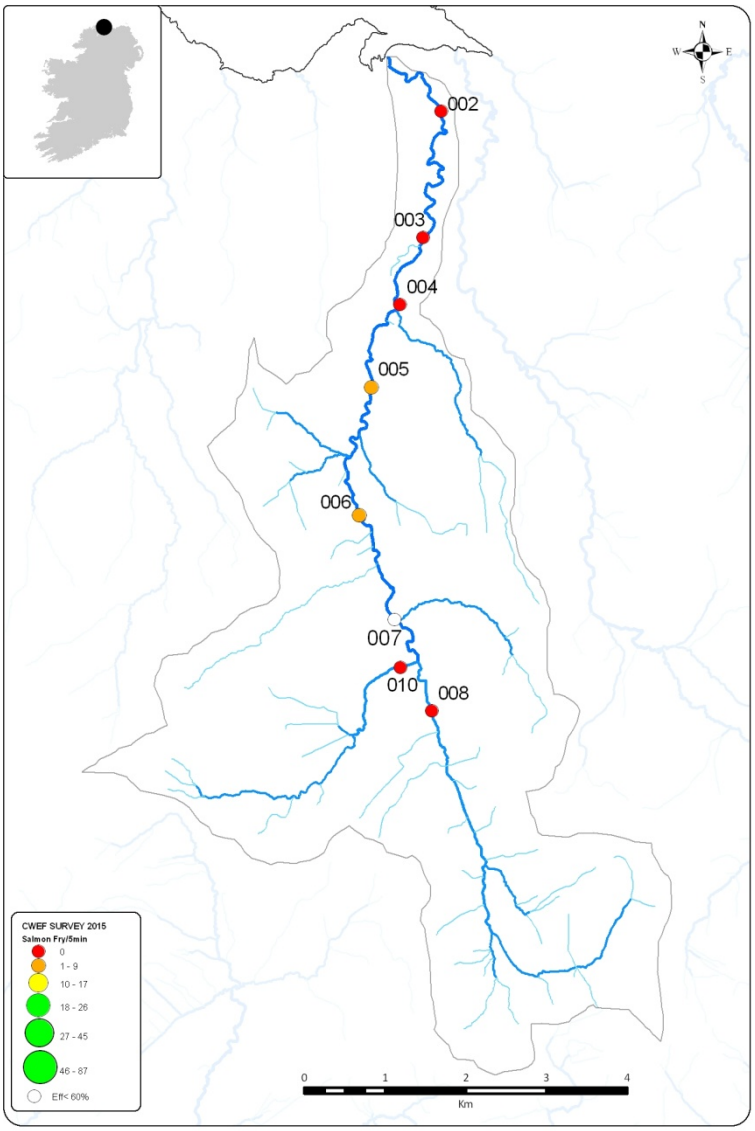
This survey, the second of this catchment in the 2007 to 2015 period, was carried out during September 2015. The survey comprised 9 sites, 8 of which were included in the analysis giving a good coverage averaging 3.41 km between survey sites. Salmon fry were present at 3 sites. The maximum fry catch was 3 salmon at site 6. The mean catch of included sites was 0.68 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 7.5cm.

Conclusion

The Donagh had a mean catch of 0.68 salfry/5min in 2015 resulting in a combined annual average of 2.46 salmon fry/5min; this is below above the threshold of 17 salmon fry per 5 minutes.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Site Status	SalFry/5min
2	247369.77	447452.69	4	1	0	Include	0
3	247148.84	445887.21	4	3	0	Include	0
4	246861.61	445055.63	4	3	0	Include	0
5	246504.91	444023.52	4	3	1	Include	1.4
6	246351.72	442434.59	4	3	3	Include	4
7	246792.53	441137.07	4	2	1	Efficiency below 60%	
8	247255.56	440004.2	3	1	0	Include	0
10	246868.29	440542.72	3	2	0	Include	0
20	0	0		1	0	Include	0

Table A.7.10.3: Site specific results of CWEF on the Donagh catchment in 2015.



Map A.7.10.1: CWEF survey site locations on the Donagh River.

A.7.11 The Culoort River.

IFI Salmon Catchment #: 261
2015 survey dates: 7/8/2015
Mean Salmon Fry/5 min (2015): 0 fry/5min.
CWEF Index: 2.2 fry/5min.

Sampling carried out by:

Cornelius McMullan
James Doherty

Fish Species Present:

Brown Trout
European Eel
Three-spined Stickleback

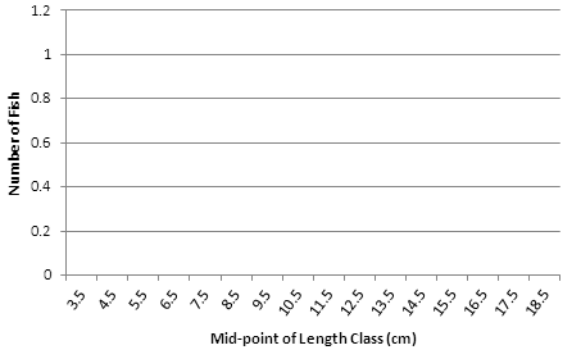


Figure A.7.11.1: Length distribution of salmon captured in 2015 CWEF survey on the Culoort Catchment.

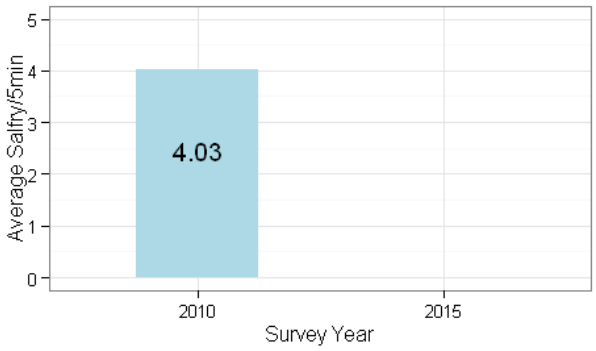


Figure A.7.11.2: Comparison of mean salfry/5 min for all surveys on the Culoort catchment to 2015.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2010	6		2			2.26
2015	2		1			6.02

Table A.7.11.1: Details of numbers of sites included in the analysis and site density of the CWEF survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	2010	222	-94	Closed	4.03	
2010	2011	222	-94	Closed		
2011	2012	222	-94	Closed		
2012	2013	222	-94	Closed		
2013	2014	252	-150	Closed		
2014	2015	251	-149	Closed	0.00	2.02

Table A.7.11.2: Conservation limits and provisional returns on the Culoort catchment along with the 2015 CWEF fishing result.

This survey, the second of this catchment in the 2007 to 2015 period, was carried out on 7th Sept 2015. Due to time constraints caused by poor weather the survey was limited comprising 3 sites, one of which was on a stream order 1 channel. Salmon fry and parr were absent from all sites. Trout fry were present at site three; trout parr were present at all sites.

The previous survey of this catchment comprised eight sites and found a total of 19 salmon at three sites, 15 fry were located at site 1, and three at site 3, a single fry was found at site two, located between sites 1 and 3. Sites 1 and 3 were fished in the 2015 survey though neither site produced salmon.

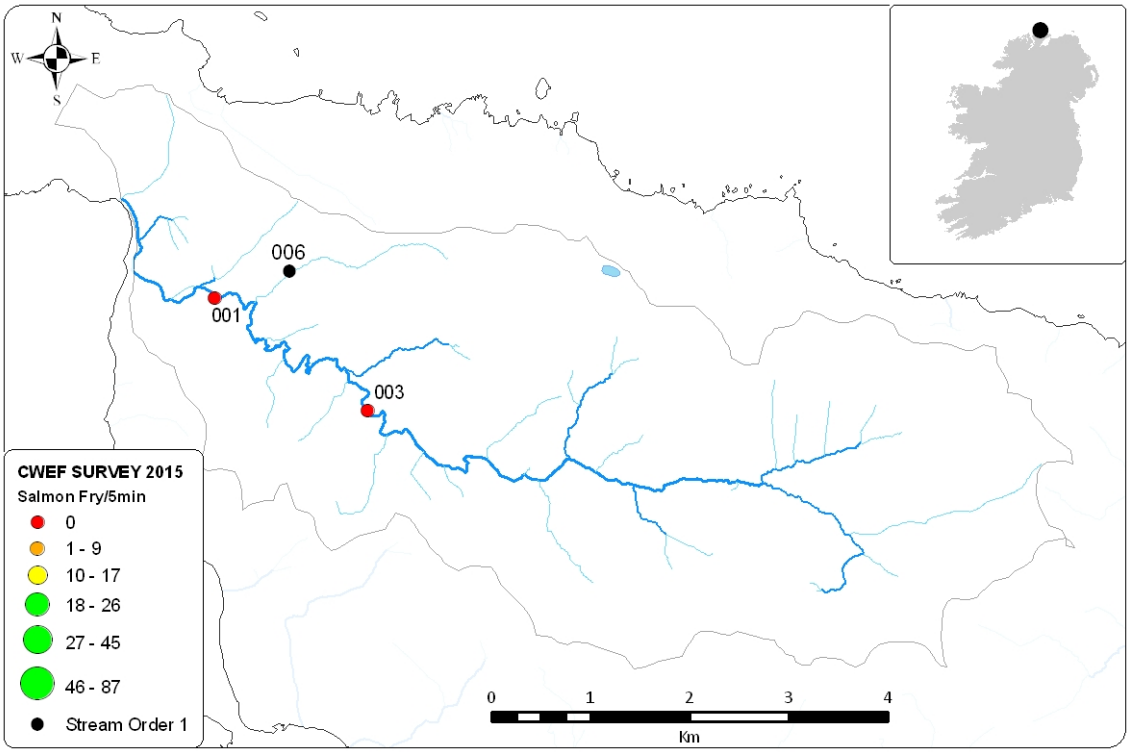
Water quality was last assessed by the EPA at two sites on the main channel on this river in 2013. The Q value at each site was found to be 4, (on a scale of 1-grossly polluted to 5-pristine unpolluted) indicating good water quality at both sites. This catchment has 7.5 ha of river accessible to salmon (McGinnity 2012), comprising about 0.06% of the national salmonid riverine habitat.

Conclusion

A limited survey was conducted in 2015 and no salmon were found at any site. This results in a combined annual average of 2.02 salmon fry/5min; this is well below the threshold of 17 salmon fry per 5 minutes. This system should be resurveyed in 2016.

Site Number	X	Y	Stream Order	Riffle Grade	Sal Fry Captured	Sal Parr Captured	Trout Fry Captured	Trout Fry Captured	Site Status	SalFry/5min
1	242253.74	456174.32	3	2	0	0	0	6	Include	0
3	243797.4	455036.62	3	1	0	0	17	18	Include	0
6	243016.03	456447.78	1	1	0	0	0	3	Stream order<2	

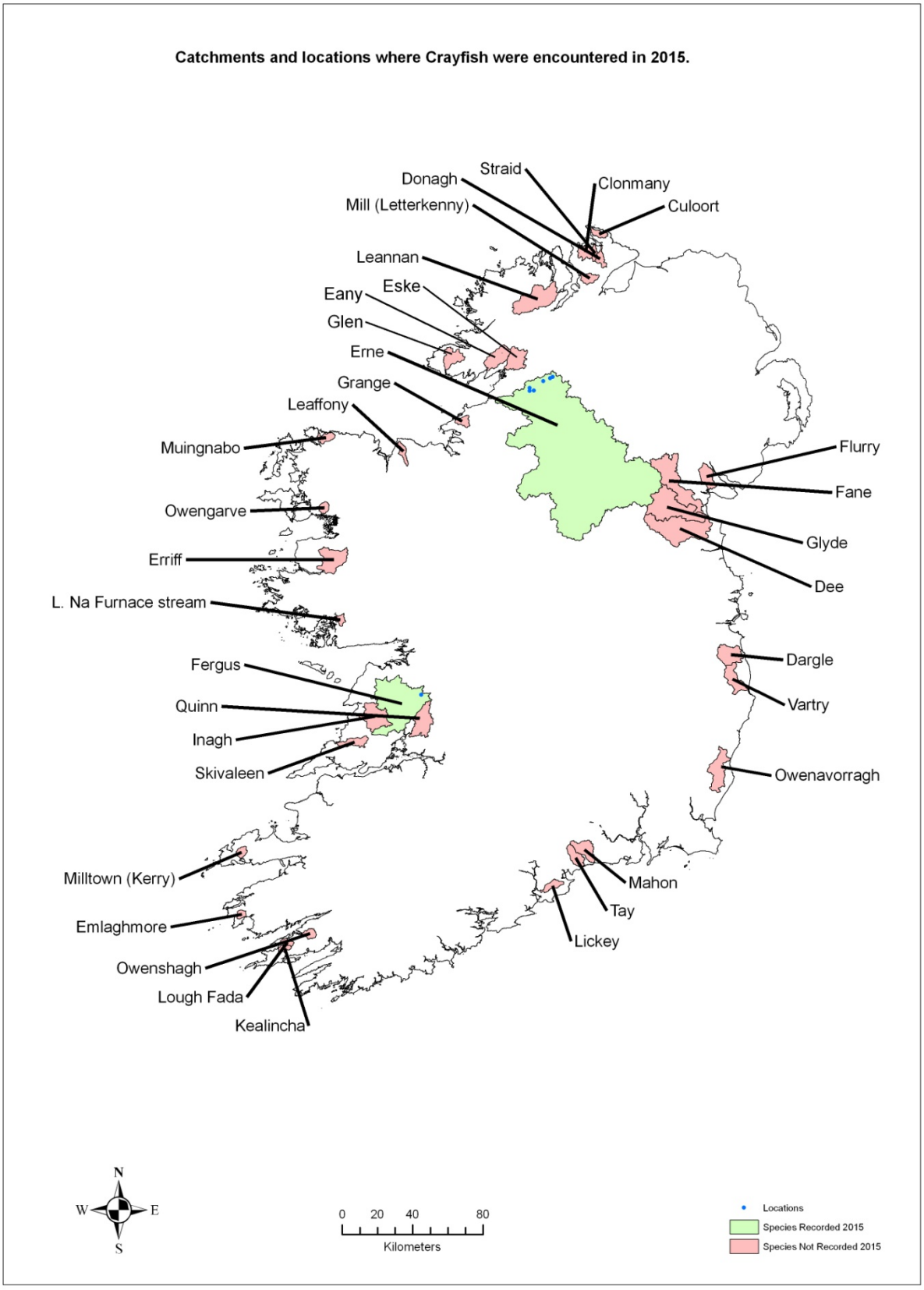
Table A.7.11.3: Site specific results of CWEF on the Culoort catchment in 2015.



Map A.7.11.1: CWEF site survey locations 2015 on the Culoort River.

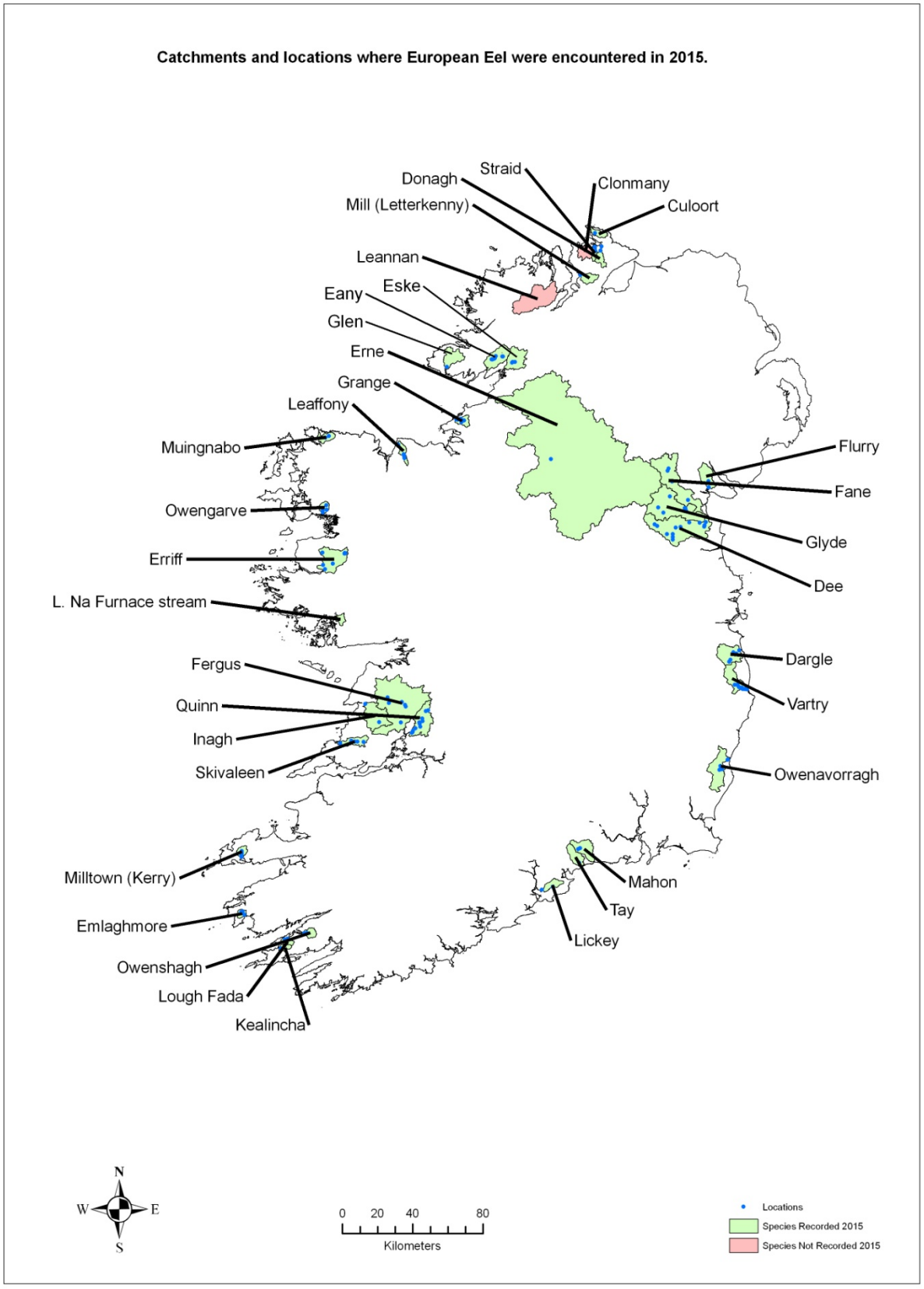
B. Other Species.

B.1 Distribution of Crayfish.



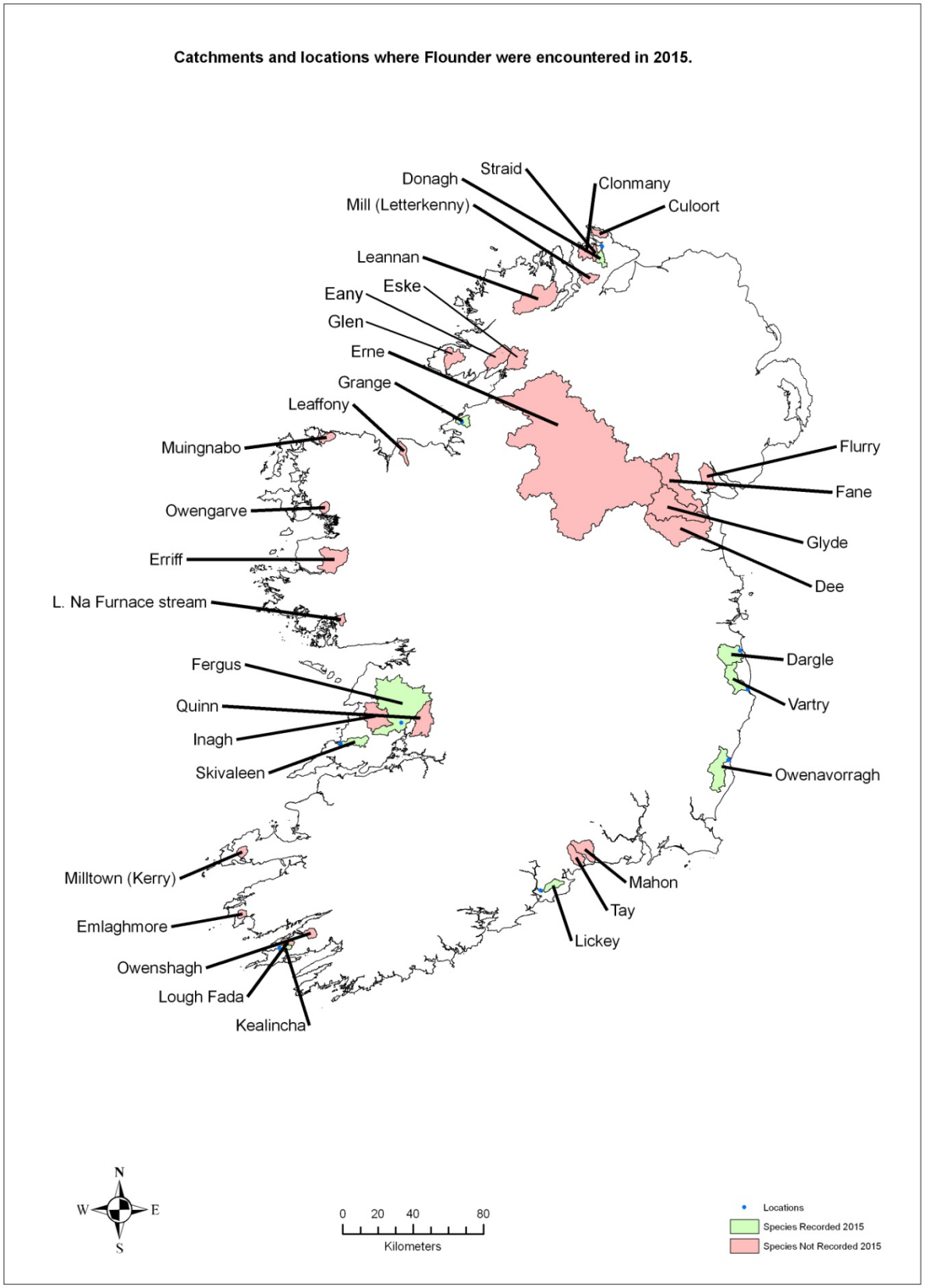
Map B.1: Reported occurrences of Crayfish from CWEF surveys 2015.

B.2 Distribution of Eel.



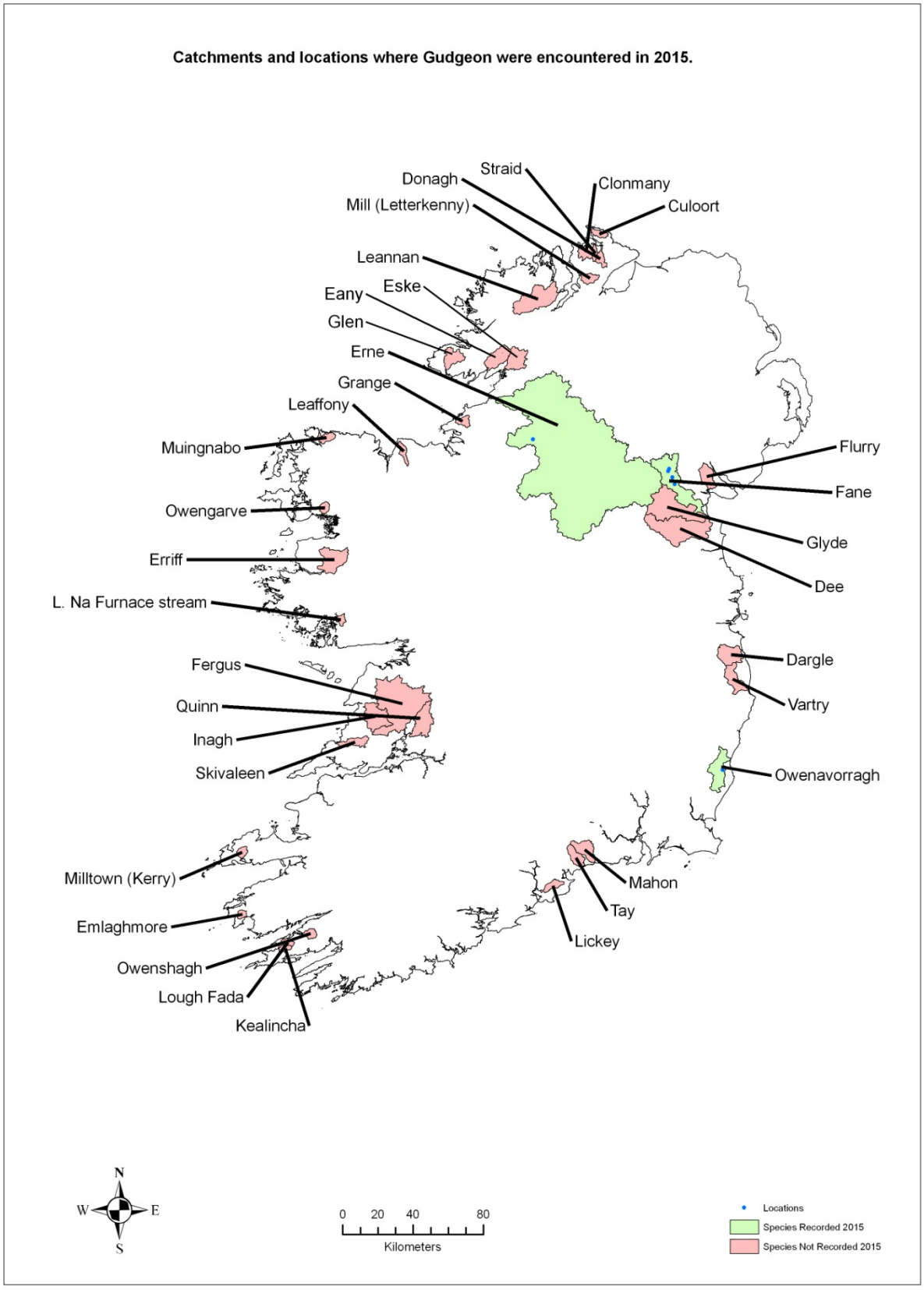
Map B.2: Reported occurrences of eel from CWEF surveys 2015.

B.3 Distribution of Flounder.



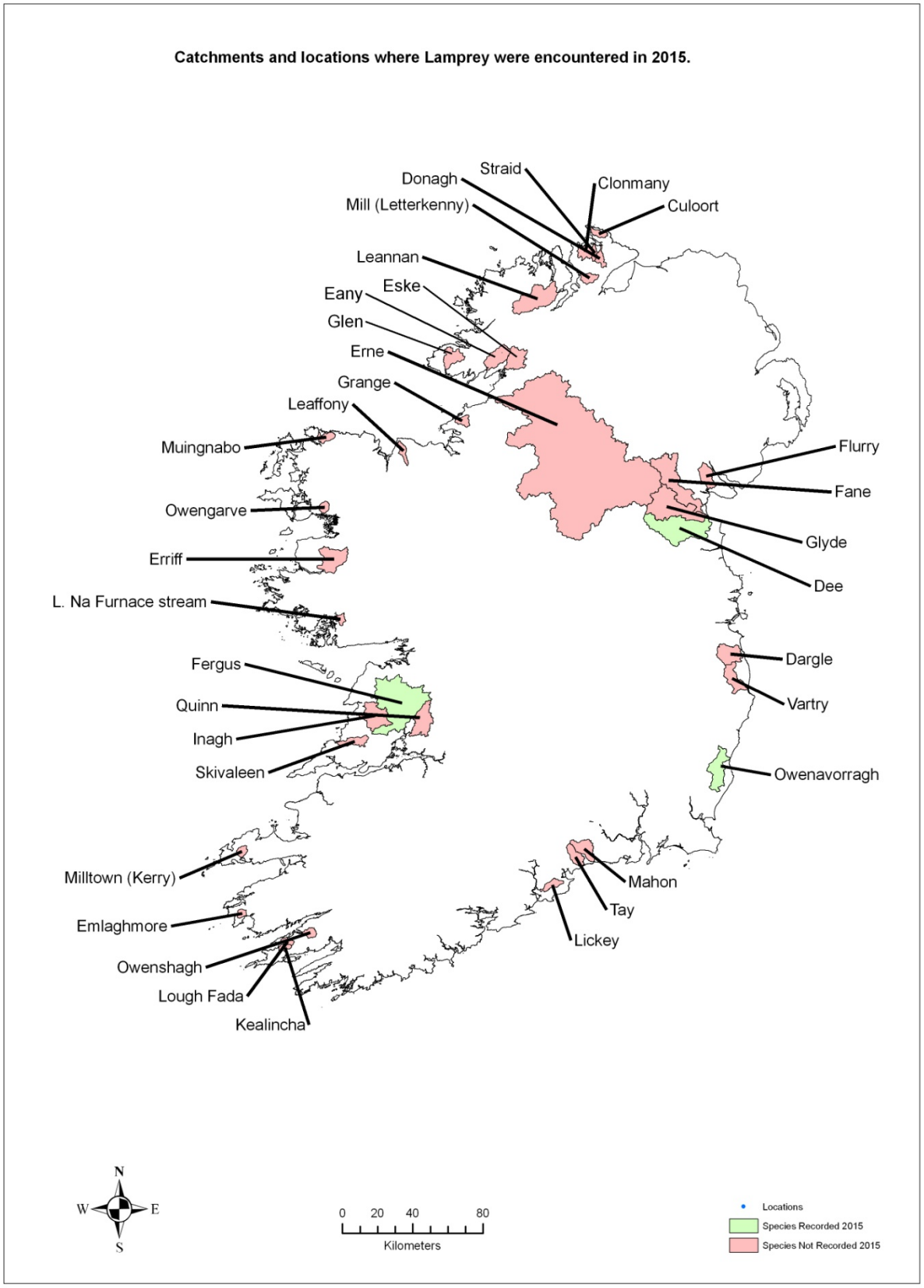
Map B.3: Reported occurrences of flounder from CWEF surveys 2015.

B.4 Distribution of Gudgeon.



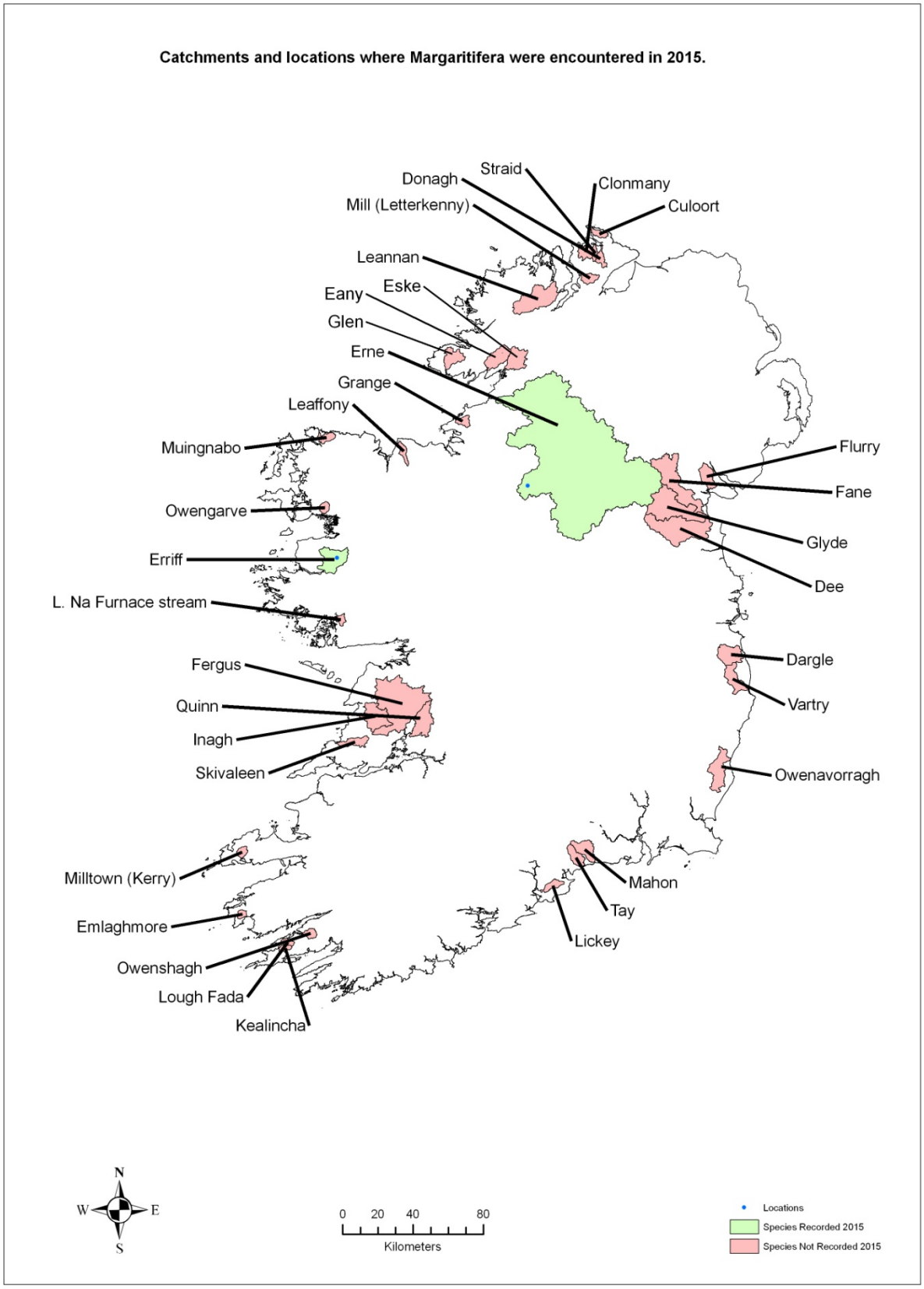
Map B.1: Reported occurrences of Crayfish from CWEF surveys 2015.

B.5 Distribution of Lamprey sp.



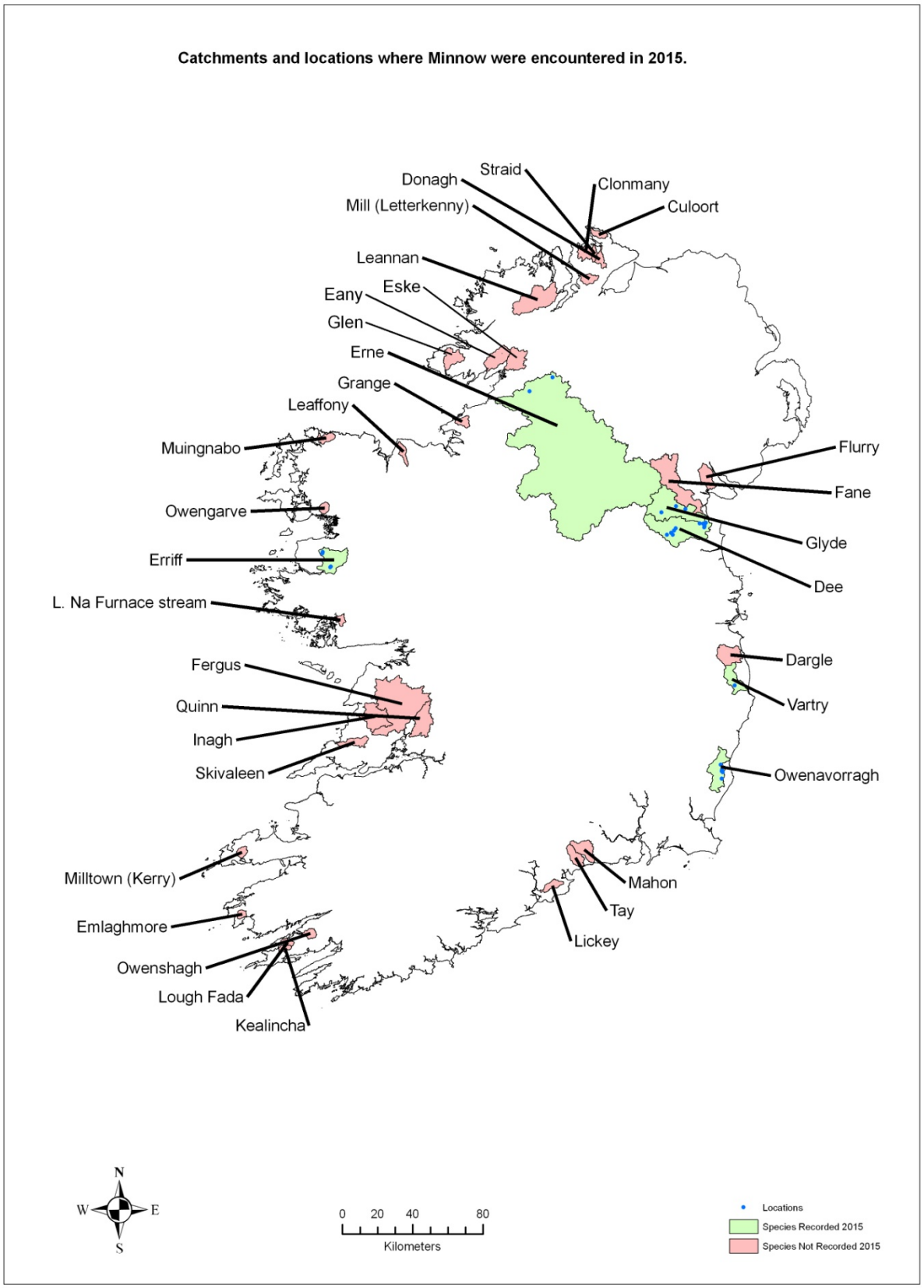
Map B.5: Reported occurrences of lamprey spp. from CWEF surveys 2015.

B.6 Distribution of Margaritifera margaritifera



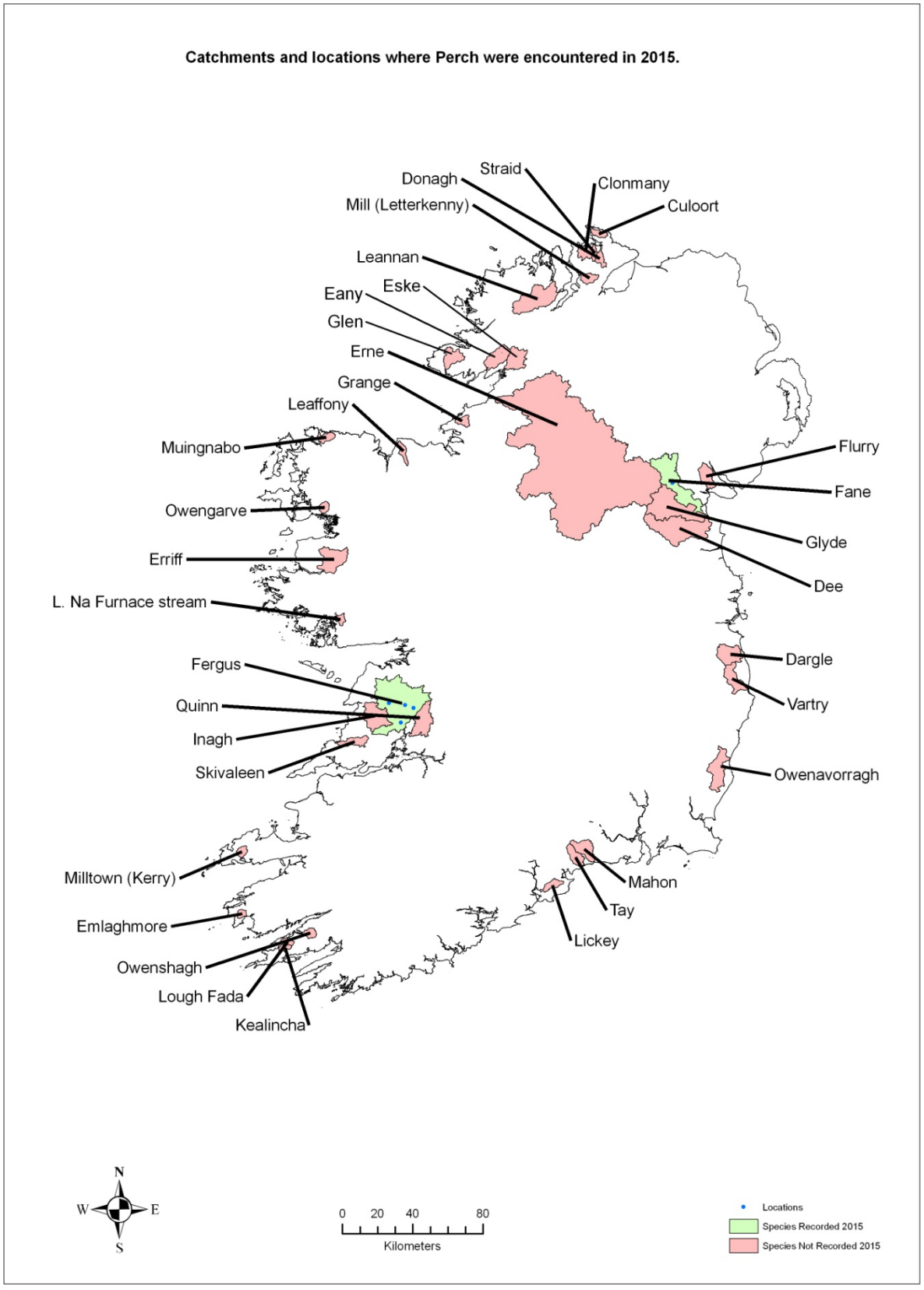
Map B.6: Reported occurrences of Margaritifera margaritifera from CWEF surveys 2015.

B.7 Distribution of Minnow



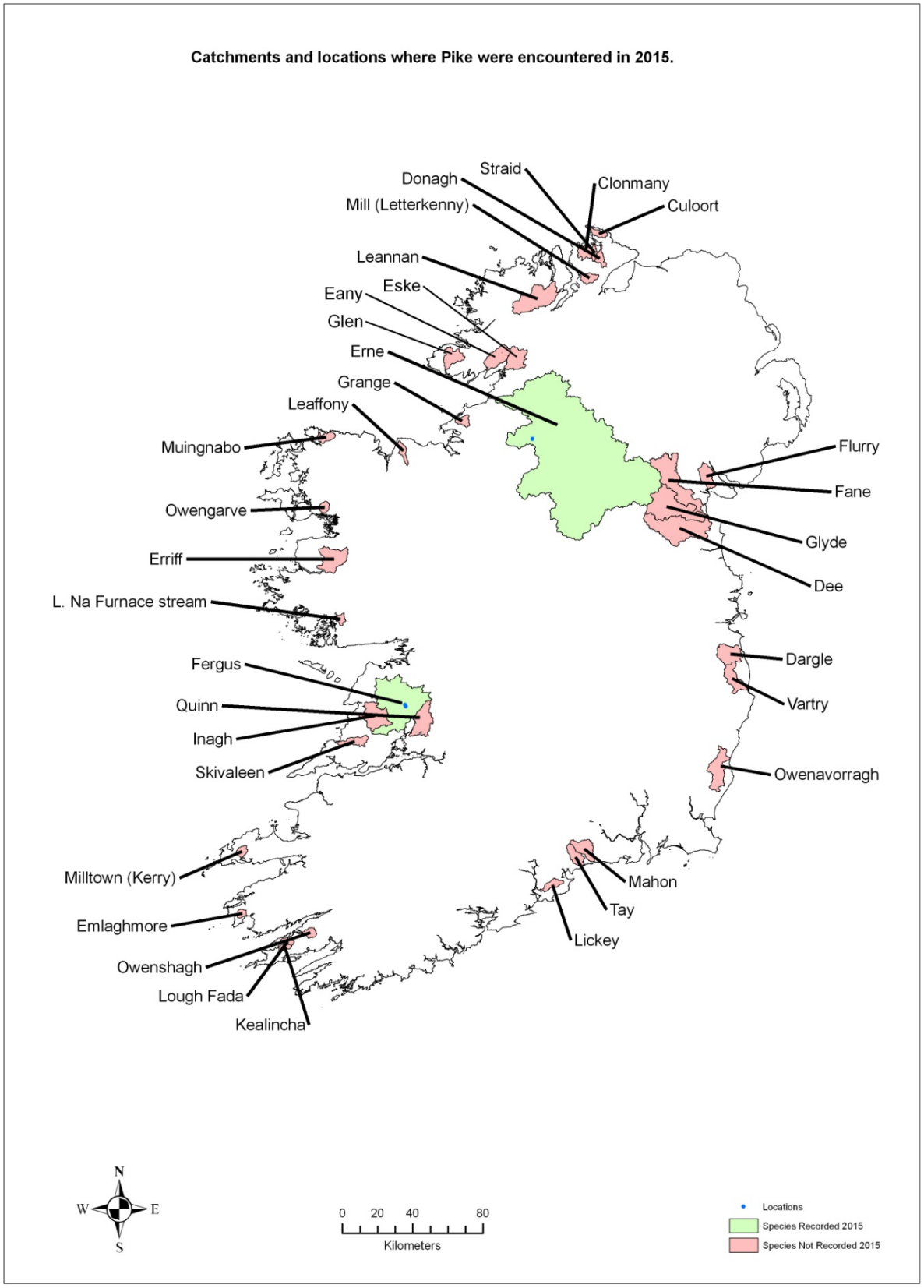
Map B.7: Reported occurrences of minnow from CWEF surveys 2015.

B.8 Distribution of Perch.



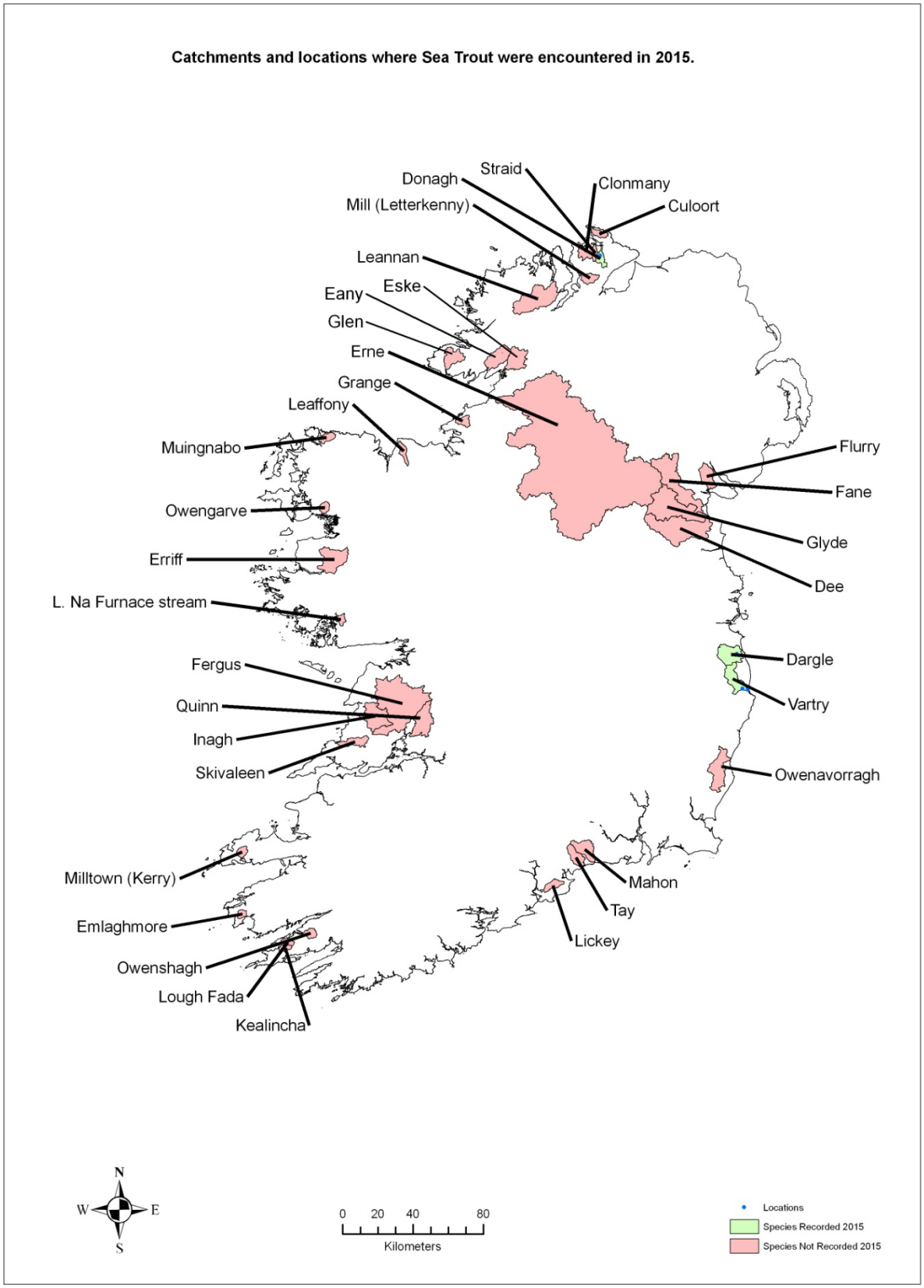
Map B.8: Reported occurrences of perch from CWEF surveys 2015.

B.9 Distribution of Pike



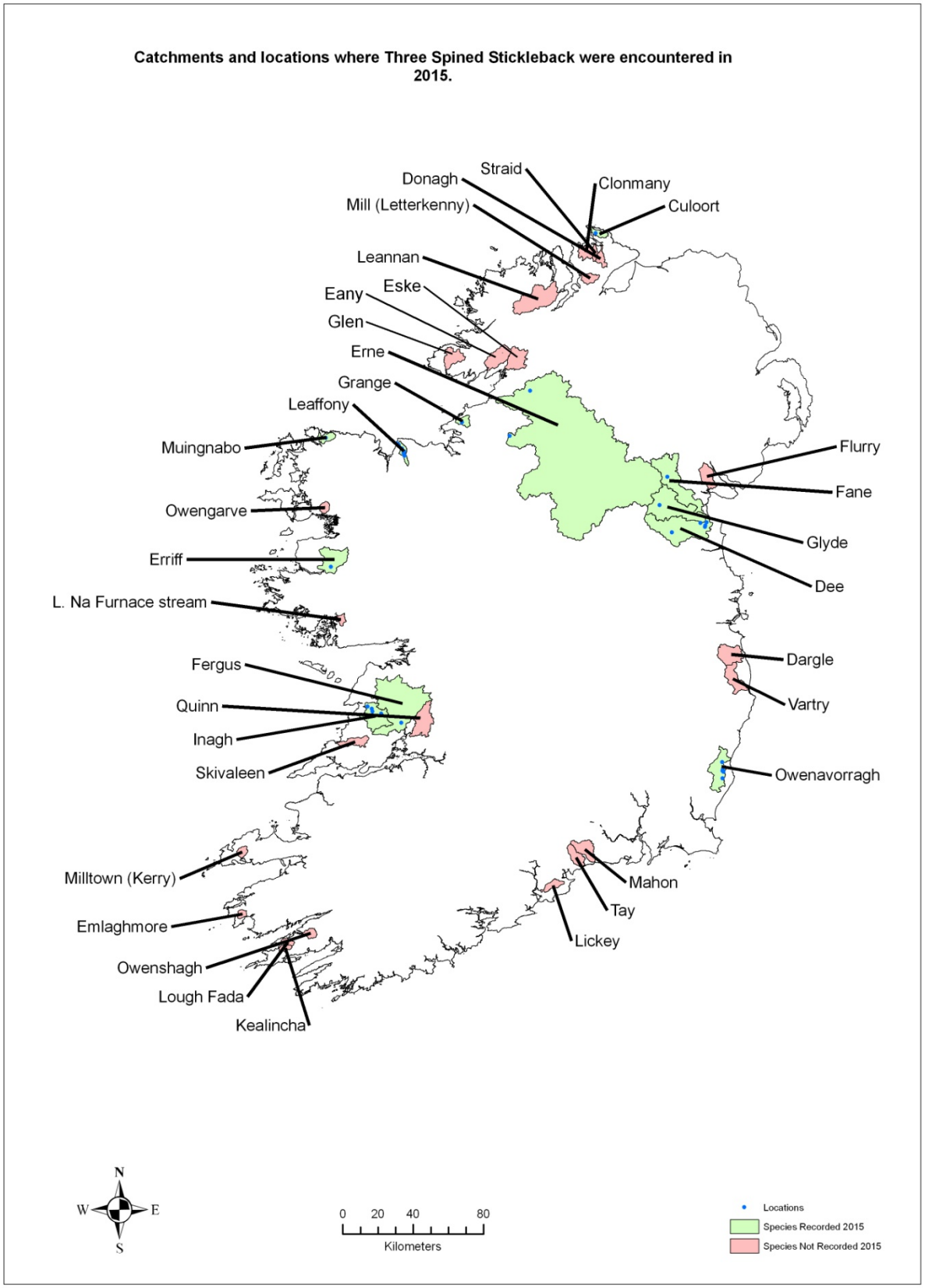
Map B.9: Reported occurrences of pike from CWEF surveys 2015.

B.10 Distribution of Sea Trout



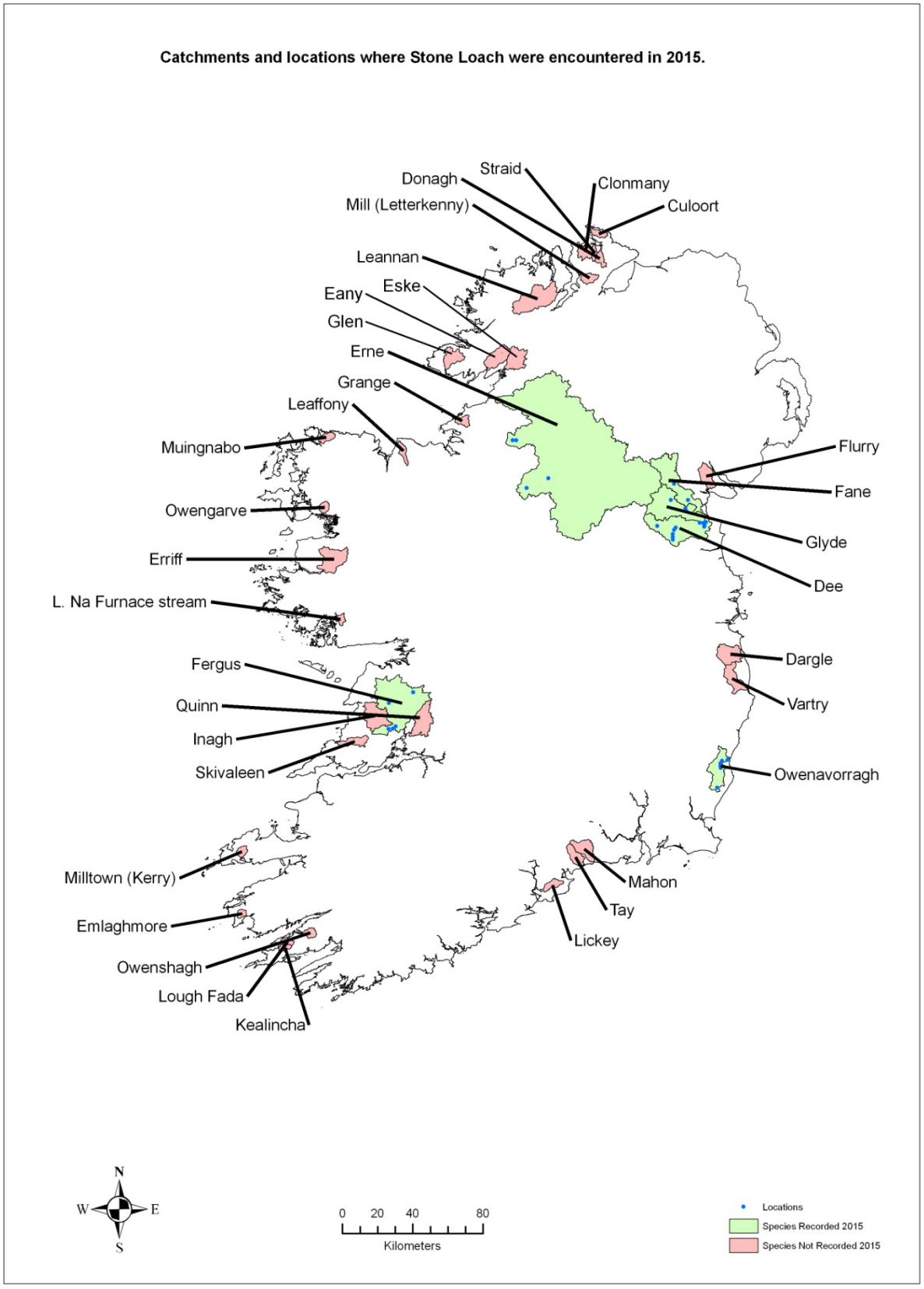
Map B.10: Reported occurrences of sea trout from CWEF surveys 2015

B.11 Distribution of 3-Spined Stickleback



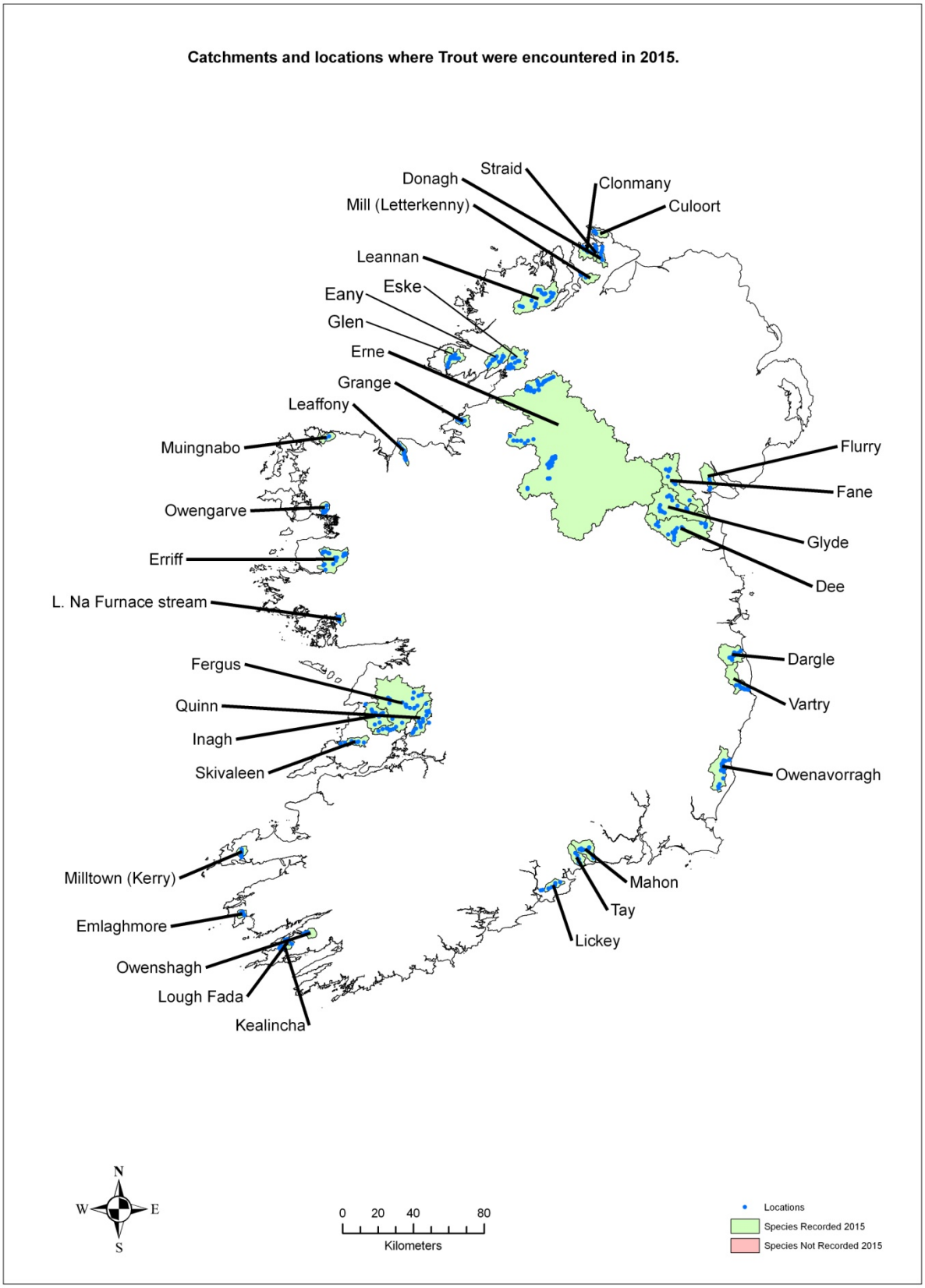
Map B.11: Reported occurrences of 3-spined stickleback from CWEF surveys 2015

B.12 Distribution of Stone Loach



Map B.12: Reported occurrences of stone loach from CWEF surveys 2015

B.13 Distribution of Trout



Map B.13: Reported occurrences of trout from CWEF surveys 2015

C. Overall Catchment-wide Electro-fishing results 2007 to 2015

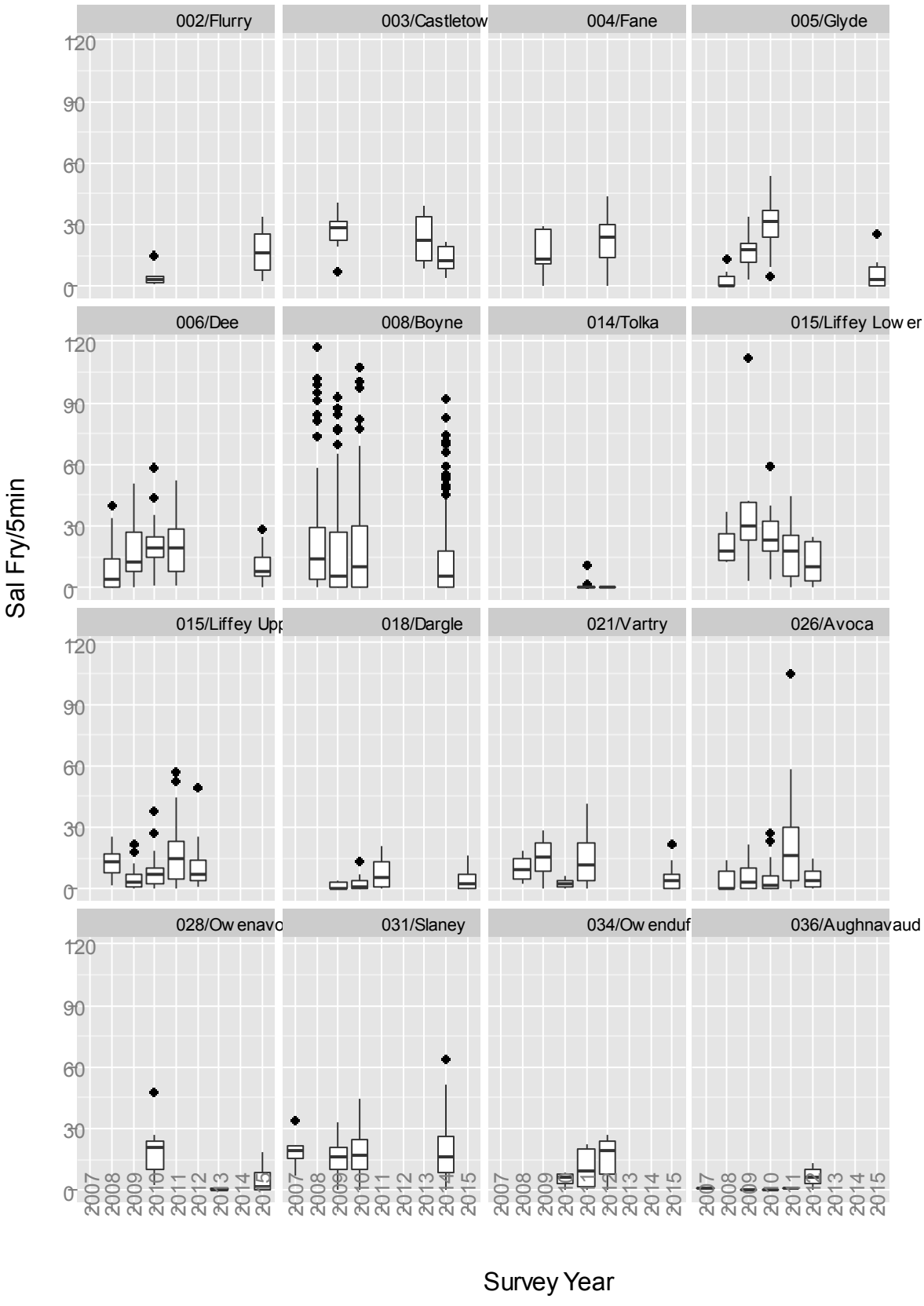
IFI Code/ River	Survey Year									Current Index	# of Annual Surveys Considered
	2007	2008	2009	2010	2011	2012	2013	2014	2015		
002/Flurry				5.24					17.15	11.19	2
003/Castletown			26.41				22.96	13.59		**20.99**	3
004/Fane			16.17			22.09			8.94*	**19.13**	3
005/Glyde		2.49	17.08	31.61					5.56	14.18	4
006/Dee		8.55	16.92	21.72	20.13				10.51	15.56	5
008/Boyne		21.91	17.54	19.38				13.25		**18.02**	4
013/Broadmeadow				0.00						0.00	1
014/Tolka					1.08	0.00				0.54	2
015/Liffey Lower		21.33	40.12	25.16	17.47	12.12				**23.24**	5
015/Liffey Upper		12.93	5.11	8.15	16.20	10.13				10.51	5
016/Dodder					13.93					13.93	1
018/Dargle			1.40	2.53	7.52				4.19	3.91	4
021/Vartry		10.00	15.11	2.54	15.07				5.34	9.61	5
026/Avoca		3.79	5.56	5.20	18.88	5.15				7.72	5
028/Owenavorragh				19.76			0.33		4.61	8.23	3
031/Slaney	19.05		15.94	18.42				17.68		**17.77**	4
032/Duncormick								11.54		11.54	1
033/Corock					37.11					**37.11**	1
034/Owenduff (Wexford)				4.97	10.65	15.91				10.51	3
035/Pollmounty	4.33									4.33	1
036/Aughnavaud	1.00		0.00	0.00	1.00	6.47				1.69	5
037/Barrow	18.92		11.10	8.83	21.59	27.32				**17.55**	5
038/Nore				18.83						**18.83**	1
050/Mahon		2.11						10.72	3.92	5.58	3
051/Tay					8.75				3.07	5.91	2
053/Colligan					29.32			9.50		**19.41**	2
055/Lickey		12.37							14.14	13.26	2
057/Finisk		10.55								10.55	1
058/Glenshelane	22.72	10.96								16.84	2
060/Bride		10.40		24.70				19.85		**18.32**	3
061/Tourig						9.40				9.40	1
062/Womanagh		15.45						2.39		8.92	2
064/Owennacurra	15.76									15.76	1
066/Lower Lee (Cork)			0.26							0.26	1
070/Argideen	17.15									**17.15**	1
077/Mealagh						12.82				12.82	1
080/Glengarriff			5.93							5.93	1
081/Adrigole							4.01	1.33		2.67	2
082/Kealincha	0.00								0.00	0.00	2
083/Lough Fada	3.23								1.68	2.45	2
085/Owenshagh							4.32		6.73	5.53	2
086/Cloonee						16.18	33.06			**24.62**	2
088/Roughty					19.78					**19.78**	1
089/Finnihy						8.61	0.00			4.31	2
090/Blackwater (Kerry)	30.54	15.52	13.35					17.82		**19.31**	4
093/Owreagh	8.94						2.07	2.81		4.61	3
097/Currane								24.51		**24.51**	1
098/Inny	24.63		19.78							**22.20**	2
099/Emlaghmore	2.07								1.45	1.76	2
101/Carhan	15.76						6.05	8.61		10.14	3
102/Ferta	19.42							10.90		15.16	2
103/Behy	15.41	6.14	4.03	8.71	7.17					8.29	5
105/Cotteners		17.42								**17.42**	1
107/Maine	31.88	32.81	34.23							**32.97**	3
108/Emlagh	10.37	3.66	13.38	3.84	2.59					6.77	5
109/Owenascaul	20.41		22.27				16.08	16.28		**18.76**	4
110/Owenalondrig			21.90							**21.90**	1
111/Milltown (Kerry)		15.33		26.44			13.02		8.76	15.89	4
112/Feohanagh			16.61				3.20	12.09		10.64	3
114/Owenmore (Kerry)	25.07									**25.07**	1

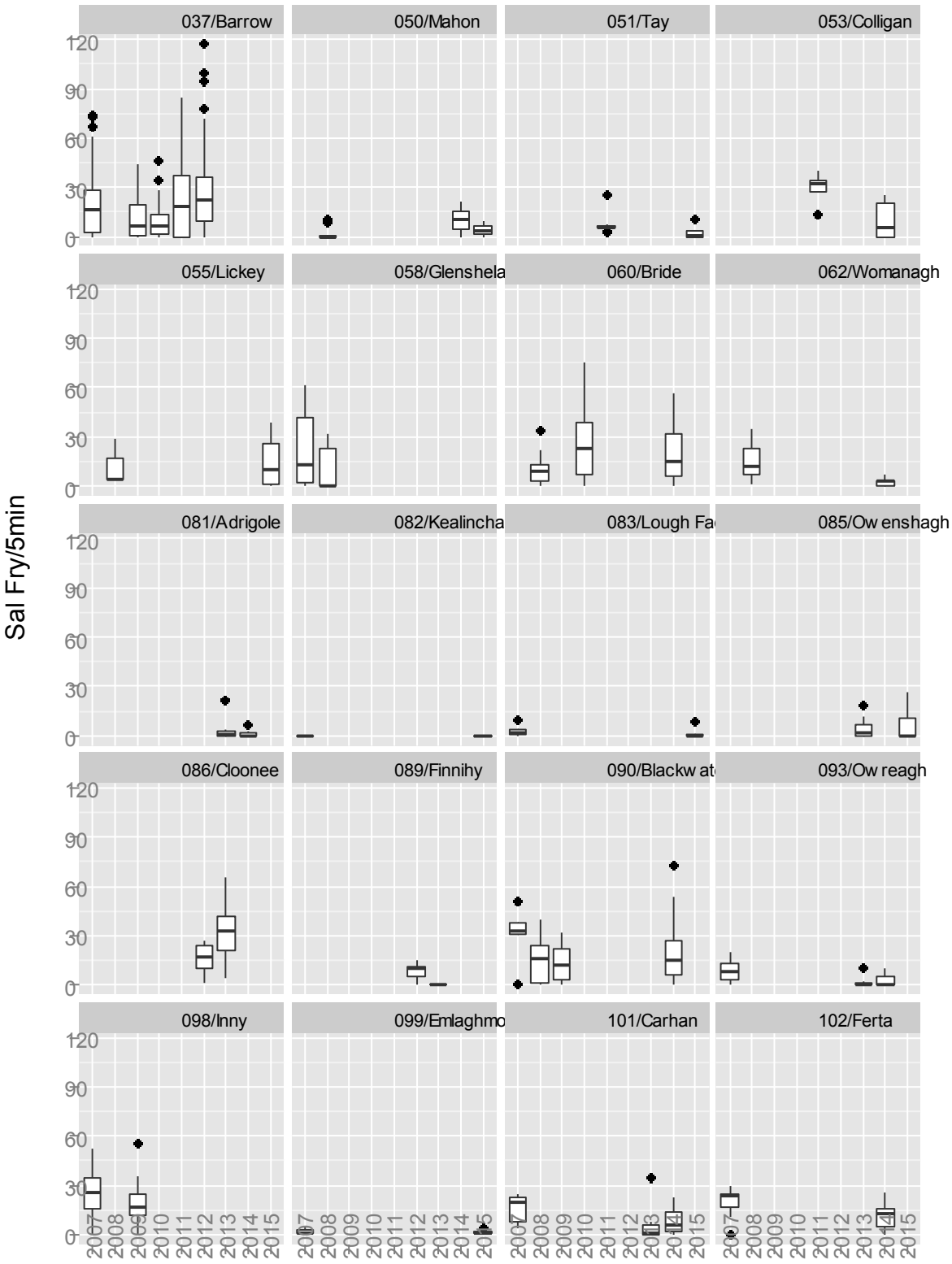
IFI Code/ River	Survey Year									Current Index	# of Annual Surveys Considered
	2007	2008	2009	2010	2011	2012	2013	2014	2015		
117/Lee (Kerry)		0.67						0.68		0.67	2
118/Brick	0.00									0.00	1
119/Feale							24.15			**24.15**	1
120/Galey			12.99							12.99	1
125/Deel					0.14			0.18		0.16	2
126/Maigue			2.82	16.05			12.05			10.31	3
128/Shannon Graney				0.19						0.19	1
128/Shannon Kilcrow				0.69						0.69	1
128/Shannon Woodford				0.00						0.00	1
130.1/Quin									7.48	7.48	1
130/Owenagarney (Ratty)							16.97	9.97		13.47	2
131/Fergus	12.96		4.10	6.84			5.89		6.66	7.29	5
133/Doonbeg				12.91				18.54		15.72	2
134/Skivaleen					14.82				11.68	13.25	2
135/Annageeragh							1.82	9.24		5.53	2
142/Inagh								5.31	3.59	4.45	2
143/Aughyvackeen					1.00					1.00	1
145/Kilcolgan			2.51							2.51	1
146/Clarinbridge					7.26					7.26	1
147/Corrib	15.75									15.75	1
148/Knock					12.53					12.53	1
149/Owenboliska (Spiddal)		4.06						4.52		4.29	2
152/Cashla							10.83			10.83	1
154/L. Na Furnace stream									0.00	0.00	1
163/Owenglin			11.57							11.57	1
167/Culfin		30.83								**30.83**	1
168/Erriff	29.51	24.10	16.03	20.43	20.86	24.45	27.45	24.90	28.52	**25.24**	5
171/Carrownisky		18.25				20.60	18.22			**19.03**	3
172/Bunowen			13.62							13.62	1
173/Owenwee (Belclare)				8.47	7.25	15.27				10.33	3
178/Newport (L. Beltra)	16.06		5.53					17.36		12.99	3
179/Srahmore			4.33							4.33	1
181/Owengarve			5.51					6.19	0.72	4.14	3
185/Owenduff (Bangor)			6.00					6.20		6.10	2
186/Owenmore - MC Muinhin (Bangor)							28.76			**28.76**	1
186/Owenmore-Carrowmore							23.07			**23.07**	1
187/Glenamoy	28.16		5.65							16.91	2
188/Muingnabo	0.78								1.88	1.33	2
193/Ballinglen	10.65				15.09		6.37			10.70	3
194/Cloonaghmore (Palmerstown)		8.96		9.71	22.27	17.32	15.02			14.65	5
196/Brusna			4.70				14.16	14.74		11.20	3
198/Leaffony	5.76		7.95						1.73	5.15	3
203/Garvogue (Bonnet)	18.41	13.26	16.83	11.31	7.08	18.54				13.41	5
205/Drumcliff				17.72						**17.72**	1
207/Grange	5.75		3.29						4.56	4.53	3
208/Duff	7.84	9.31	18.59	25.16						15.23	4
210/Erne		7.37	0.17	0.08	0.00	0.00	0.00	1.60	1.16	0.55	5
211/Abbey							7.20	28.14		**17.67**	2
212/Ballintra			10.27				13.40	18.07		13.91	3
213/Laghy			8.58				14.97	11.02		11.52	3
214/Eske		13.10	16.99	16.30					13.45	14.96	4
215/Eany				15.86		30.08			12.89	**19.61**	3
216/Oily			9.49		33.68			16.62		**19.93**	3
217/Bungosteen					25.12		17.09			**21.11**	2
219/Glen (Ballyshannon)				19.44					18.37	**18.91**	2
220/Owenwee (Yellow R)	21.45	5.00	14.81			20.31	19.65			16.24	5
221/Bracky		10.82				21.57		12.24		14.88	3

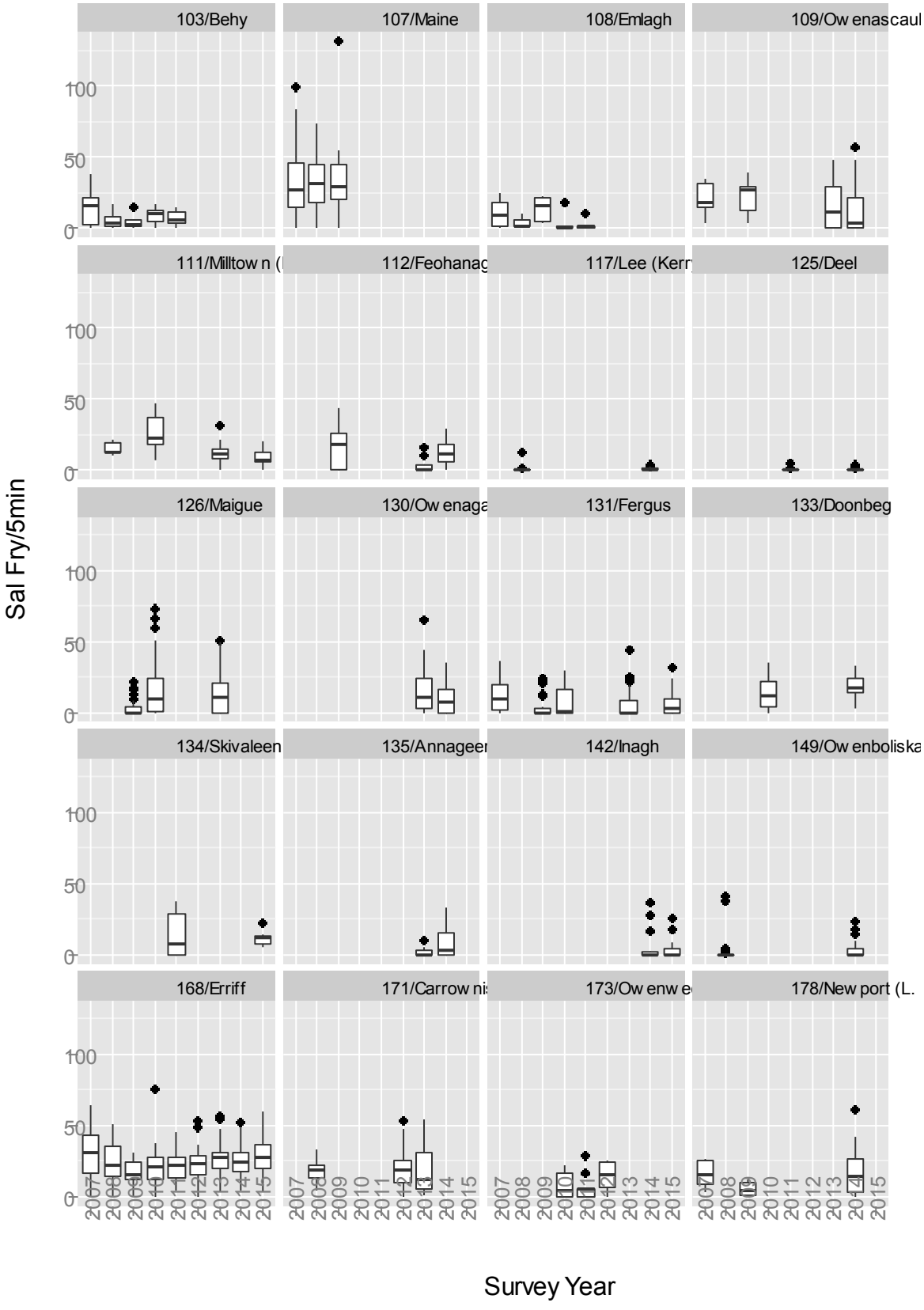
IFI Code/ River	Survey Year									Current Index	# of Annual Surveys Considered
	2007	2008	2009	2010	2011	2012	2013	2014	2015		
222/Owentocker		20.06								**20.06**	1
226/Owenamarve			3.76				2.64	1.00		2.47	3
228/Gweedore (Crolly R.)		15.99			11.32					13.65	2
229/Clady		16.12				37.21				**26.67**	2
234/Glenna			16.80		3.77		7.77			9.45	3
235/Tullaghobegly		8.33		9.05						8.69	2
236/Ray		6.43			14.89			17.31		12.88	3
240/Lackagh		18.86	15.82		19.20	23.57				**19.36**	4
248/Leannan	9.47	7.41	8.73	16.71	12.36	21.51	19.51	20.87	15.27	**17.90**	5
249/Swilly		9.33	7.36				18.08	8.05		10.71	4
250/Isle (Burn)						2.12				2.12	1
251/Burnfoot		7.77		2.90						5.33	2
252/Mill (Letterkenny)				0.00					0.00	0.00	2
253/Crana			15.74							15.74	1
256/Clonmany		16.61		6.59					4.21	9.14	3
257/Straid				0.20					0.00	0.10	2
258/Donagh				4.25					0.68	2.46	2
259/Glennagannon			16.65		4.05		7.13			9.28	3
261/Culoort				4.03					0.00	2.02	2

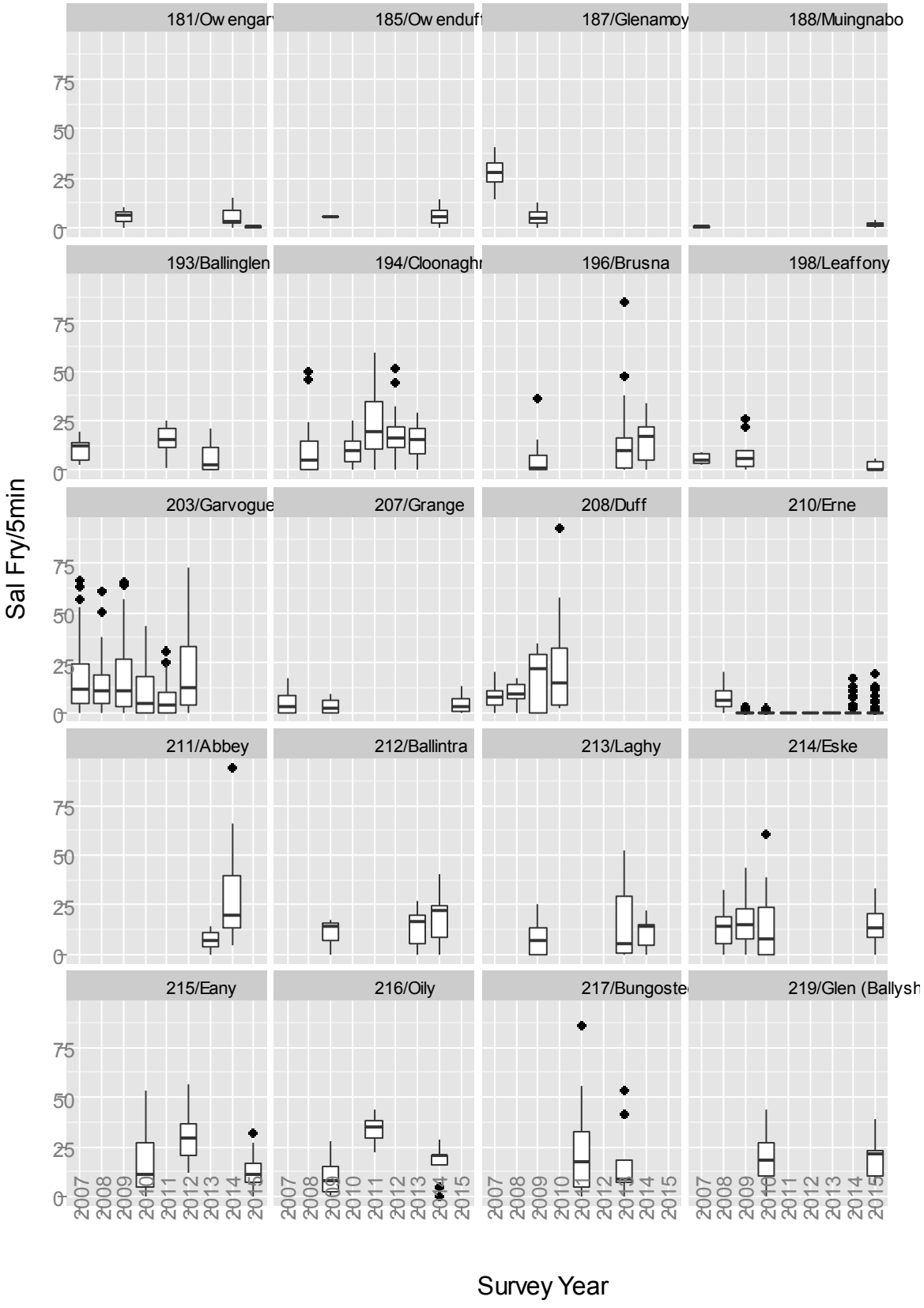
Table C.1: Summary of annual CWEF mean for all systems included in analyses 2007-2015.

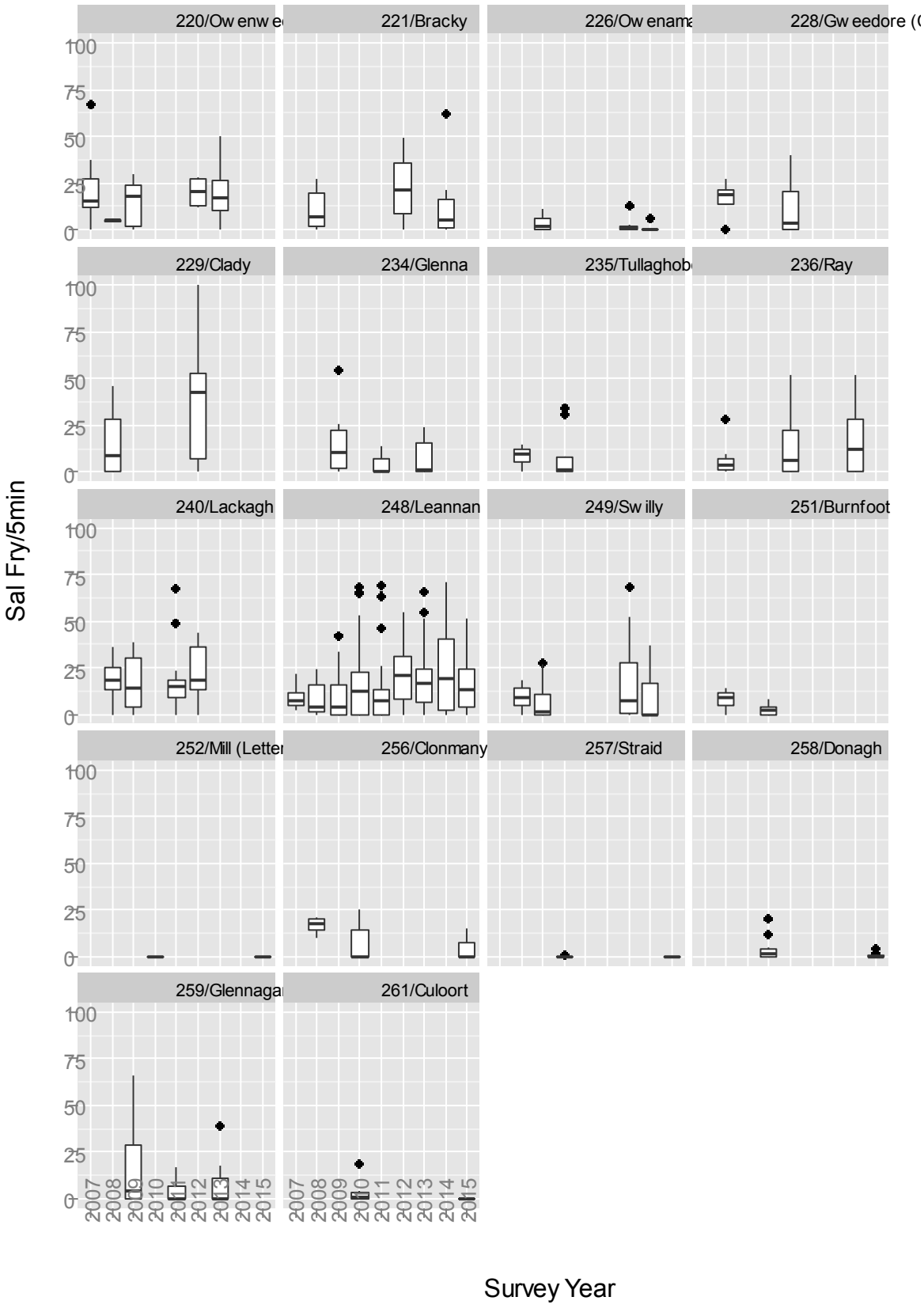
D. Boxplots: CWEF results included in analysis for each catchment >2 surveys from 2007-2015




037/Barrow
050/Mahon
051/Tay
053/Colligan
055/Lickey
058/Glenshela
060/Bride
062/Womanagh
081/Adrigole
082/Kealincha
083/Lough Fa
085/Ow enshagh
086/Cloonee
089/Finnihy
090/Blackw at
093/Ow reagh
098/Inny
099/Emlaghmo
101/Carhan
102/Ferta
Sal Fry/5min
Survey Year


103/Behy
107/Maine
108/Emlagh
109/Ow enascaul
111/Milltow n (
112/Feohanag
117/Lee (Kerr
125/Deel
126/Maigue
130/Ow enaga
131/Fergus
133/Doonbeg
134/Skivaleen
135/Annageer
142/Inagh
149/Ow enboliska
168/Erriff
171/Carrow ni
173/Ow enw e
178/New port (L.
Sal Fry/5min
Survey Year


181/Ow engar
185/Ow enduf
187/Glenamoy
188/Muingnabo
193/Ballinglen
194/Cloonaghr
196/Brusna
198/Leaffony
203/Garvogue
207/Grange
208/Duff
210/Erne
211/Abbey
212/Ballintra
213/Laghy
214/Eske
215/Eany
216/Oily
217/Bungoste
219/Glen (Ballysh
Sal Fry/5min
0
25
50
75
2007
2008
2009
2010
2011
2012
2013
2014
2015
Survey Year


220/Ow enw e
221/Bracky
226/Ow enama
228/Gw eedore (
229/Clady
234/Glenna
235/Tullaghob
236/Ray
240/Lackagh
248/Leannan
249/Sw illy
251/Burnfoot
252/Mill (Letter
256/Clonmany
257/Straid
258/Donagh
259/Glennaga
261/Culoort
100
75
50
25
0
2007
2008
2009
2010
2011
2012
2013
2014
2015
Sal Fry/5min
Survey Year

E. Sampling Density / Survey Quality

These data represent **the numbers of sites electrofished/total length of channel (≥SO2) in a given system**. Low values signify excellent coverage and high values indicate poor coverage. Low sampling site density can occur in larger catchments or where water and or weather conditions are unsuitable.

IFI Code/ River	2 km per Site	5 km per Site	Km Length > SO1	Km/site Achieved									
				2007	2008	2009	2010	2011	2012	2013	2014	2015	Min
002/Flurry	**11**	4	21.6				2.7					5.4	2.7
003/Castletown	**15**	6	29.2			2.2				2.7	2.7		2.2
004/Fane	**52**	21	104.5			14.9			7.5			9.5	7.5
005/Glyde	**83**	33	165.2		10.3	11.0	11.8					11.0	10.3
006/Dee	**100**	40	200.8		6.9	10.6	10.0	10.0				10.0	6.9
008/Boyne	**555**	222	1110.5		8.4	7.6	7.7				7.5		7.5
013/Broadmeadow	**58**	23	116.0				38.7						38.7
014/Tolka	**41**	16	82.3					6.9	41.2				6.9
015/Liffey Lower	**61**	24	121.8		20.3	20.3	11.1	7.2	17.4				7.2
015/Liffey Upper	**206**	82	412.4		24.3	12.9	11.1	7.6	15.9				7.6
016/Dodder	**47**	19	93.0					15.5					15.5
018/Dargle	**39**	15	77.4		38.7	12.9	4.3	4.8				4.6	4.3
021/Vartry	**22**	9	44.1		11.0	11.0	3.4	4.0				2.9	3.4
026/Avoca	**172**	69	344.6		16.4	11.1	13.3	4.3	11.5				4.3
028/Owenavorragh	**47**	19	94.7				13.5			15.8		5.3	13.5
031/Slaney	**433**	173	865.9	108		18.0	11.0				7.2		7.2
032/Duncormick	**16**	6	31.4								15.7		15.7
033/Corock	**47**	19	94.6				31.5	15.8	23.6				15.8
034/Owenduff (Wexford)	**16**	7	32.7				10.9	5.5	5.5				5.5
035/Pollmounty	**8**	3	16.7	2.4		5.6							2.4
036/Aughnavaud	**8**	3	16.1	16.1		16.1	16.1	16.1	4.0				4.0
037/Barrow	**531**	212	1062.3	12.1		13.3	13.0	12.8	10.5				10.5
038/Nore	**555**	222	1110.5				10.8						10.8
050/Mahon	**32**	13	64.1		6.4						8.0	8.0	6.4
051/Tay	**21**	8	41.1					6.8			41.1	8.2	6.8
053/Colligan	**28**	11	55.5					11.1			4.6		4.6
055/Lickey	**10**	4	19.7		4.9							2.2	4.9
057/Finisk	**29**	12	58.6		4.5								4.5
058/Glenshelane	**13**	5	26.5	4.4	4.4								4.4
060/Bride	**80**	32	160.7		7.7		6.2				4.3		4.3
061/Tourig	**8**	3	16.7						2.1				2.1
062/Womanagh	**26**	11	52.8		4.8						3.5		3.5
064/Owennacurra	**23**	9	46.4	2.6									2.6
066/Lower Lee (Cork)	**225**	90	449.1			19.5							19.5
070/Argideen	**30**	12	60.4	3.0									3.0
072/Ilen	**93**	37	185.5						26.5				26.5
077/Mealagh	**25**	10	49.2						4.5				4.5
080/Glengarriff	**22**	9	44.5			4.9							4.9
081/Adrigole	**18**	7	35.0							3.9	3.2		3.2
082/Kealincha	**12**	5	23.8	7.9								4.8	7.9
083/Lough Fada	**13**	5	25.8	5.2								4.3	5.2
085/Owenshagh	**26**	11	52.9							3.3		5.3	3.3
086/Cloonee	**8**	3	15.6						2.2	2.6			2.2
088/Roughty	**99**	40	198.8					15.3					15.3
089/Finnihy	**11**	4	22.1						3.7	3.7			3.7
090/Blackwater (Kerry)	**40**	16	80.8	16.2	6.2	5.8					1.9		1.9
093/Owreagh	**9**	3	17.4	2.9						2.9	2.2		2.2
097/Currane	**39**	16	77.7								1.4		1.4
098/Inny	**43**	17	85.1	3.9		4.3							3.9
099/Emlaghmore	**7**	3	15.0	3.0								3.7	3.0

IFI Code/ River	2 km per Site	5 km per Site	Km Length > SO1	Km/site Achieved									
				2007	2008	2009	2010	2011	2012	2013	2014	2015	Min
101/Carhan	9	4	18.0	3.0						2.3	1.8		1.8
102/Ferta	17	7	34.4	4.3							2.6		2.6
103/Behy	14	6	28.2	3.5	2.8	2.8	3.1	2.8					2.8
105/Cotteners	14	6	28.8		2.4								2.4
107/Maine	94	37	187.3	3.3	3.6	11.0							3.3
108/Emlagh	10	4	20.1	5.0	4.0	4.0	4.0	4.0					4.0
109/Owenascaul	17	7	34.2	5.7		3.4				3.4	2.6		2.6
110/Owenalondrig	8	3	16.2			2.3							2.3
111/Milltown (Kerry)	8	3	16.4		2.7		2.0			1.8		2.0	1.8
112/Feohanagh	15	6	29.4			2.9				2.7	2.4		2.4
114/Owenmore (Kerry)	10	4	19.4	1.5									1.5
117/Lee (Kerry)	44	18	87.6		2.6						4.6		2.6
118/Brick	54	22	108.4	18.1									18.1
119/Feale	168	67	335.7							5.7			5.7
120/Galey	61	24	121.6			3.8							3.8
125/Deel	126	50	251.2					2.5			2.4		2.4
126/Maigue	209	84	418.3			6.5	4.8			3.0			3.0
128/Shannon Graney	78	31	155.6				2.5						2.5
128/Shannon Kilcrow	97	39	193.1				3.4						3.4
128/Shannon Woodford	14	6	27.9				1.9						1.9
130/Owenagarney (Ratty)	45	18	89.3							3.0	3.9		3.0
131/Fergus	117	47	233.2	12.3		6.5	6.0			3.2		4.4	3.2
133/Doonbeg	35	14	69.1				2.6				3.3		2.6
134/Skivaleen	15	6	29.9					2.5				3.0	2.5
135/Annageeragh	18	7	35.6							2.0	2.0		2.0
142/Inagh	60	24	120.7								4.0	5.2	4.0
143/Aughyvackeen	17	7	34.8					2.0					2.0
145/Kilcolgan	81	32	162.5			4.6							4.6
146/Clarinbridge	21	8	41.9					6.0					6.0
147/Corrib	635	254	1269.2	38.5									38.5
148/Knock	10	4	19.9					3.3					3.3
149/Owenboliska (Spidd.)	29	12	58.1		2.2						2.8		2.2
152/Cashla	24	10	49.0							1.5			1.5
154/L. Na Furnace stream	6	2	11.7									2.9	11.7
163/Owenglin	20	8	39.5			2.1							2.1
167/Culfin	11	4	21.2		3.0								3.0
168/Erriff	71	28	141.8	2.7	2.9	2.7	2.8	4.1	4.1	4.2	4.1	3.8	2.7
171/Carrownisky	21	8	41.7		2.1				2.2	2.5			2.1
172/Bunowen	35	14	69.7			23.2							23.2
173/Owenwee (Belclare)	21	8	41.4				3.8	4.6	3.8				3.8
178/Newport (L. Beltra)	54	22	107.5	9.0		13.4					3.8		3.8
179/Srahmore	35	14	69.2			23.1							23.1
181/Owengarve	12	5	24.9			6.2					2.8	5.0	2.8
185/Owenduff (Bangor)	64	25	127.3			63.7					9.1		9.1
186/Owenmore - MC Muinhin (Bangor)	101	40	201.1			33.5				5.0			5.0
186/Owenmore-Carrowmore	32	13	64.1							3.6			3.6
187/Glenamoy	33	13	65.4	4.7		9.3							4.7
188/Muingnabo	17	7	33.8	8.4								16.9	8.4
193/Ballinglen	20	8	39.3	6.5				2.8		3.6			2.8
194/Cloonaghmore (Palmerstown)	60	24	120.5		2.9		3.5	2.9	3.7	4.2			2.9
196/Brusna	51	21	102.7			2.9				3.4	3.7		2.9
198/Leaffony	13	5	25.2	4.2		1.8						1.8	1.8
203/Garvogue (Bonnet)	129	51	257.2	4.9	4.9	4.7	4.7	9.9	6.1				4.7
205/Drumcliff	31	12	62.3				3.5						3.5
207/Grange	21	8	42.0	8.4		7.0						6.0	7.0
208/Duff	48	19	96.5	8.8	9.6	10.7	8.8						8.8
210/Erne	10	4	19.6		1.2	0.9	0.3	1.0	0.3	0.6	0.4	0.3	0.3
211/Abbey	15	6	29.6							14.8	1.6		1.6
212/Ballintra	42	17	83.2			27.7				5.2	6.4		5.2
213/Laghy	23	9	46.7			5.2				4.2	3.9		3.9
214/Eske	58	23	115.8		8.3	7.2	6.8					5.0	6.8
215/Eany	72	29	144.1				4.8		6.9			5.8	4.8

IFI Code/ River	2 km per Site	5 km per Site	Km Length > SO1	Km/site Achieved									
				2007	2008	2009	2010	2011	2012	2013	2014	2015	Min
216/Oily	**23**	9	46.2			4.2		6.6			3.6		3.6
217/Bungosteen	**22**	9	44.1					4.4		4.4			4.4
219/Glen (Ballyshannon)	**41**	16	82.0				4.6					5.9	4.6
220/Owenwee (Yellow R)	**9**	3	17.3	1.6	5.8	2.2			4.3	1.1			1.1
221/Bracky	**18**	7	35.1		4.4				2.5		2.9		2.5
222/Owentocker	**22**	9	43.4		4.3								4.3
226/Owenamarve	**8**	3	16.3			2.3				2.3	2.3		2.3
228/Gweedore (Crolly R.)	**15**	6	29.2		5.8			2.4					2.4
229/Clady	**29**	12	58.4		9.7				5.3				5.3
234/Glenna	**10**	4	19.0			3.2		3.2		3.2			3.2
235/Tullaghobegly	**9**	3	17.2		5.7		1.7						1.7
236/Ray	**23**	9	45.1		5.6			4.1			3.8		3.8
240/Lackagh	**45**	18	90.6		9.1	7.6		6.5	6.5				6.5
248/Leannan	**110**	44	219.0	24.3	7.6	7.6	7.6	7.6	7.6	8.4	8.4	8.4	7.6
249/Swilly	**45**	18	90.8		30.3	5.3				6.5	5.7		5.3
250/Isle (Burn)	**24**	10	48.6						4.9				4.9
251/Burnfoot	**12**	5	24.0		6.0		4.8						4.8
252/Mill (Letterkenny)	**15**	6	29.2				9.7					9.7	9.7
253/Crana	**43**	17	86.6			3.6							3.6
256/Clonmany	**18**	7	35.3		8.8		2.9					3.9	2.9
257/Straid	**11**	5	22.5				4.5					4.5	4.5
258/Donagh	**15**	6	30.7				3.1					3.4	3.1
259/Glennagannon	**13**	5	26.6			2.7		2.4		2.4			2.4
261/Culoort	**9**	4	18.1				2.3					6.0	2.3

Table E.1: CWEF survey site density (no. sites sampled/total length of channel (≥SO 2)).