Report on Salmon Monitoring Programmes (June 2017-June 2018) funded under the Salmon Conservation Fund

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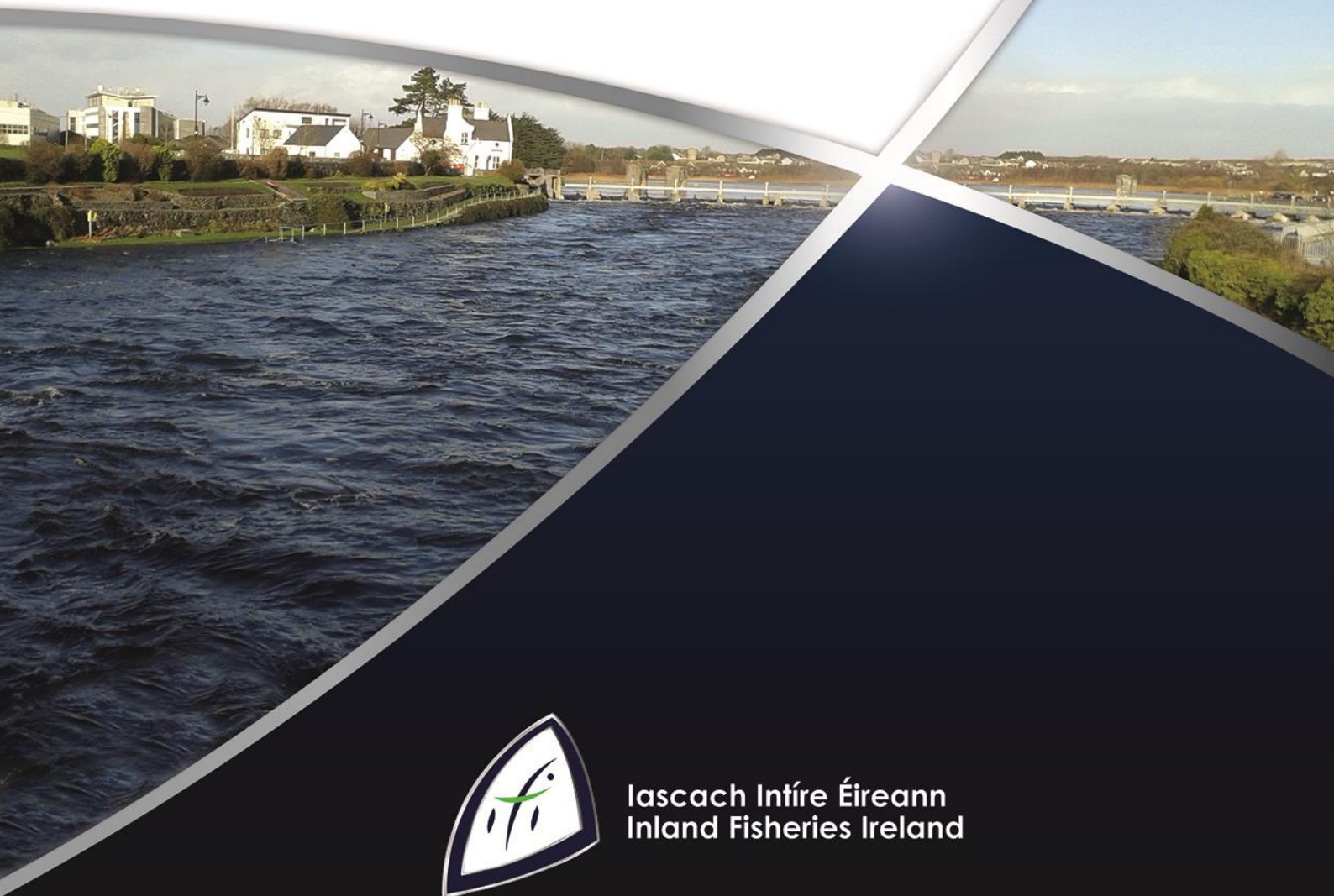

Iascach Intíre Éireann
Inland Fisheries Ireland

Report on Salmon Monitoring Programmes (June 2017- June 2018) funded under the Salmon Conservation Fund.

13/12/19

Report on Salmon Monitoring Programme 2017.

Report on projects to assess attainment of Conservation Limit for Atlantic Salmon in Irish waters.

Project personnel:

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Acknowledgements.

Much of the catchment wide electro-fishing programme was undertaken by the staff of the River Basin Districts (formerly the seven Regional Fisheries Boards). The excellent contribution and cooperation of the staff of each of the Boards during the fieldwork element of these projects is greatly appreciated.

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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 2017/2018 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 is undertaken to assess distribution and abundance of salmon fry in selected catchments nationally. The method 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.

- Catchment Wide electro-fishing was undertaken in 35 catchments or sub-catchments nationally in 2017 (July – September). A total of 854 sites were visited. A number of catchments, primarily in the west and northwest, had persistently high water levels throughout the summer preventing the completion of a number of surveys. 28 catchments or sub-catchments were surveyed completely. Mean CWEF abundance ranged from zero salmon fry/5min on the Annalee on the upper Erne, to a catchment average of 24.09 salmon fry per 5 min on the Cloonee. The Cloonee, Lackagh, Leannan, Laune, Oily, Doonbeg and Duff recorded an annual catchment wide average of >17 fry per 5 min. The Erriff, IFI's National Salmonid Index Catchment, recorded an annual catchment wide average of >17 fry. The Erriff is a CWEF index catchment which is surveyed annually.

- Partial survey of the Fane Catchment subsequent to the breaching of the Art Hamyl Weir at Cullaville has found evidence of Salmon presence above the weir.

- In general, rivers where the CWEF threshold value was ≥ 17 over the 2007-2017 period, (within the most recent five-year period where several annual survey data are available), are open as catch and release fisheries. Overall good agreement was observed between 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 a robust 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) and no other status assessment method is available.

- In order to enhance smolt to adult marine survival data for wild salmon in Irish rivers, a PIT tag recording system was installed in the River Erriff (National Salmonid Index Catchment) in 2016 to provide a direct count of the numbers of returning tagged adult fish. Up to 3000 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. Wild salmon smolts were captured and PIT tagged in spring 2016 and 2017 at two main sites on the system. A corresponding programme also commenced in the Corrib system in 2017, with smolts tagged at the Galway weir in advance of the installation of a similar PIT tag reader there in the Denil fish pass and associated submersible PIT tag antenna.

- In 2017, a total of 30 PIT tagged adult salmon returned to the Erriff representing a provisional marine survival of 2.9% for the cohort tagged in 2016. Any multi-sea-winter fish which return in 2018 will have to be considered when finalising this estimate. A more comprehensive picture of salmon marine survival trends will become available when a more long-term time series of results are available.

- Salmon scales were collected and analysed for life history information from the commercial fisheries in Castlemaine and Cork harbour, Cashen (Feale) and Mulkear fisheries. The Castlemaine fishery recorded 83% grilse and 17% multi sea-winter (MSW). The Cashen fish were 71% grilse, 26% MSW and 9% previously spawned grilse (PSG). Cork harbour recorded 81% grilse and 19% MSW. The fish recovered from the Mulkear were 91% grilse and 9% MSW.

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

1. Assessment of Attainment of Conservation Limits for Atlantic Salmon in Irish Rivers in 2017: 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 2017 to assess attainment of salmon conservation limits nationally. This report presents the results of activities undertaken in 2017 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 2017 and June 2018:

1. **Catchment wide Electro-Fishing Programme:**

Undertake 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:**

The salmon smolt to adult return rate is widely used for scientific assessments of salmon status (e.g. ICES, NASCO etc) to support species management. Reduced survival in this phase is the major pointer towards likely 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 Salmonid Index Catchment) to provide a direct count of the numbers of returning tagged adult fish. Up to 3000 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 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 develop a meaningful dataset.

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 2017.

2. Catchment wide electrofishing programme 2017.

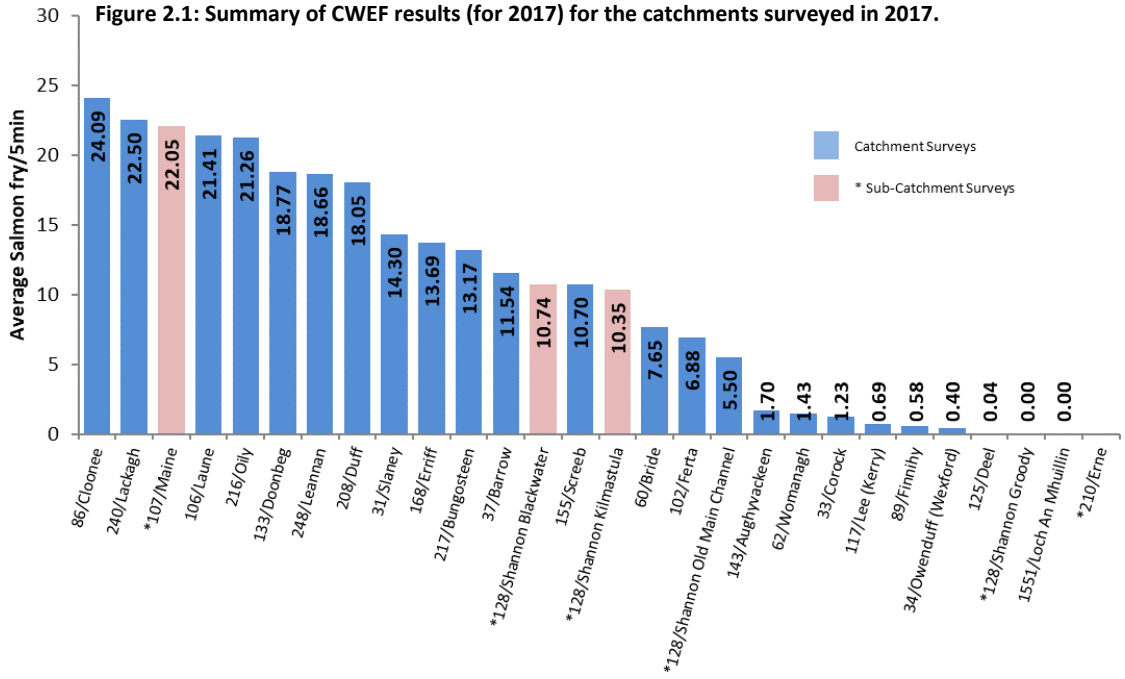
Sampling Methodology

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

2.1.Results 2017

During 2017, Catchment Wide electro-fishing was undertaken in 35 catchments or sub-catchments to assess abundance and distribution of salmon fry (Table 3.1.1). A number of catchments, primarily in the west and northwest, had persistently high water levels throughout the summer preventing the completion of a number of surveys; 24 catchments were surveyed completely including a survey of the small catchment of Loch An Mhuillin in Connemara. Six planned surveys of certain sub-catchments were also completed: The Brown Flesk on the Maine system, and the Groody, Kilmastula and Blackwater on the Lower Shannon, and the Annalee on the upper Erne were completed. A total of 854 sites were visited. 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.

Figure 2.1: Summary of CWEF results (for 2017) for the catchments surveyed in 2017.



CWEF results for salmon fry in 2017 are summarised in Figure 2.1, Map 2.1 and Table 2.1. Mean CWEF abundance ranged from an average of zero fry/5min on the Annalee on the upper Erne, to a catchment average of 24.09 Cloonee. The Cloonee, Lackagh, Leannan, Laune, Oily, Doonbeg and Duff recorded an annual catchment wide average of >17 fry per 5 min The Erriff, IFI's National Salmonid Index Catchment, recorded an annual catchment wide average of >17 fry. The Erriff and Leannan are CWEF index catchments which are sampled annually. Several catchments surveyed in 2017 were small catchments, which historically produced low numbers of adult salmon, while others were sampled primarily to report their salmon biodiversity status. Table 2.1 also summarises all CWEF data (2007-2017) for catchments surveyed in 2017. Eight catchments surveyed in 2017 had a mean annualised catchment wide salmon fry index (all years) of ≥ 17 fry: these were the Fane, Cloonee, Laune, Maine, Erriff, Oily, Bungosteen, Lackagh and Leannan.

Table 2.1 Summary of Annual results and current CWEF indices for Catchments surveyed in 2017.

	Survey Year												
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Current Index	# Surveys Considered
004/Fane			16.17			22.09			8.94*		0.50†	**19.13**	2
031/Slaney	19.05		15.94	18.42				17.68		8.70	14.30	15.01	5
033/Corock					37.11					5.47	1.23	14.60	3
034/Owenduff (Wexford)				4.97	10.65	15.91				3.47	0.40	7.08	5
037/Barrow	17.72		10.93	8.71	21.23	26.72				8.93†	11.54	15.83	5
060/Bride		10.40		24.70				19.85			7.65	15.65	4
062/Womanagh		15.45						2.39			1.43	6.42	3
086/Cloonee						16.18	33.06				24.09	**24.44**	3
089/Finnihy						8.61	0.00				0.58	3.06	3
102/Ferta	19.42							10.74			6.88	12.35	3
106/Laune		17.4*									21.41	**21.41**	1
107/Maine -Brown Flesk	31.88	32.81	34.23								22.05*	**32.97**	3
117/Lee (Kerry)		0.67						0.68			0.69	0.68	2
125/Deel					0.18			0.23		1.96†	0.04	0.15	3
128/Shannon - Blackwater											10.74*		
128/Shannon - Groody											0.00*		
128/Shannon - Kilmastula											10.35*		
128/Shannon - Old Main Channel											5.50*†		
133/Doonbeg				12.28				17.39		16.1†	18.77	16.15	3
143/Aughyvackeen					1.00						1.70	1.35	2
Loch An Mhuillin (Galway)											0.00*		
155/Screebe											10.70	10.70	1
168/Erriff	29.51	24.10	16.03	20.43	20.86	24.45	27.45	24.90	28.52	21.72	13.69	**23.26**	5
171/Carrownisky		18.25				20.60	18.22				4.25†	**19.02**	3
194/Cloonaghmore (Palmerstown)		8.96		9.71	22.27	17.32	15.02				5.07†	14.66	5
208/Duff	7.84	9.31	18.59	25.16							18.05	15.79	5
210/Erne		7.37	0.17	0.08	0.00	0.00	0.00	1.60	1.16	1.25	0.00	0.80	5
216/Oily			9.49		33.68			16.62			21.26	**20.26**	4
217/Bungosteen					27.91		19.23				13.17	**20.10**	3
240/Lackagh		18.86	15.82		19.20	23.57				17.5†	22.50	**19.99**	5
248/Leannan	9.47	7.41	8.73	16.71	12.36	21.51	19.51	20.87	15.27	15.0†	18.66	**19.16**	5
253/Crana			15.74							6.00†	6.93†	15.74	1

† - incomplete or partial surveys; * - Sub-catchment surveys.

2.2.Results 2007 to 2017

Update for 2017.

From 2007 to 2017 a total of 146 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 404 catchment surveys amounting to 9,473 individual site surveys have been conducted nationally. This approach is consistent with the SSCS approach to other datasets and reduces the potential of one extreme result influencing the data disproportionately. The current catchment-specific CWEF indices presented in this document are based on the most recent 5 CWEF survey results collated from survey activity since 2008. Annualised CWEF results 2007 to 2017 for all catchment surveyed are presented in Appendix C.

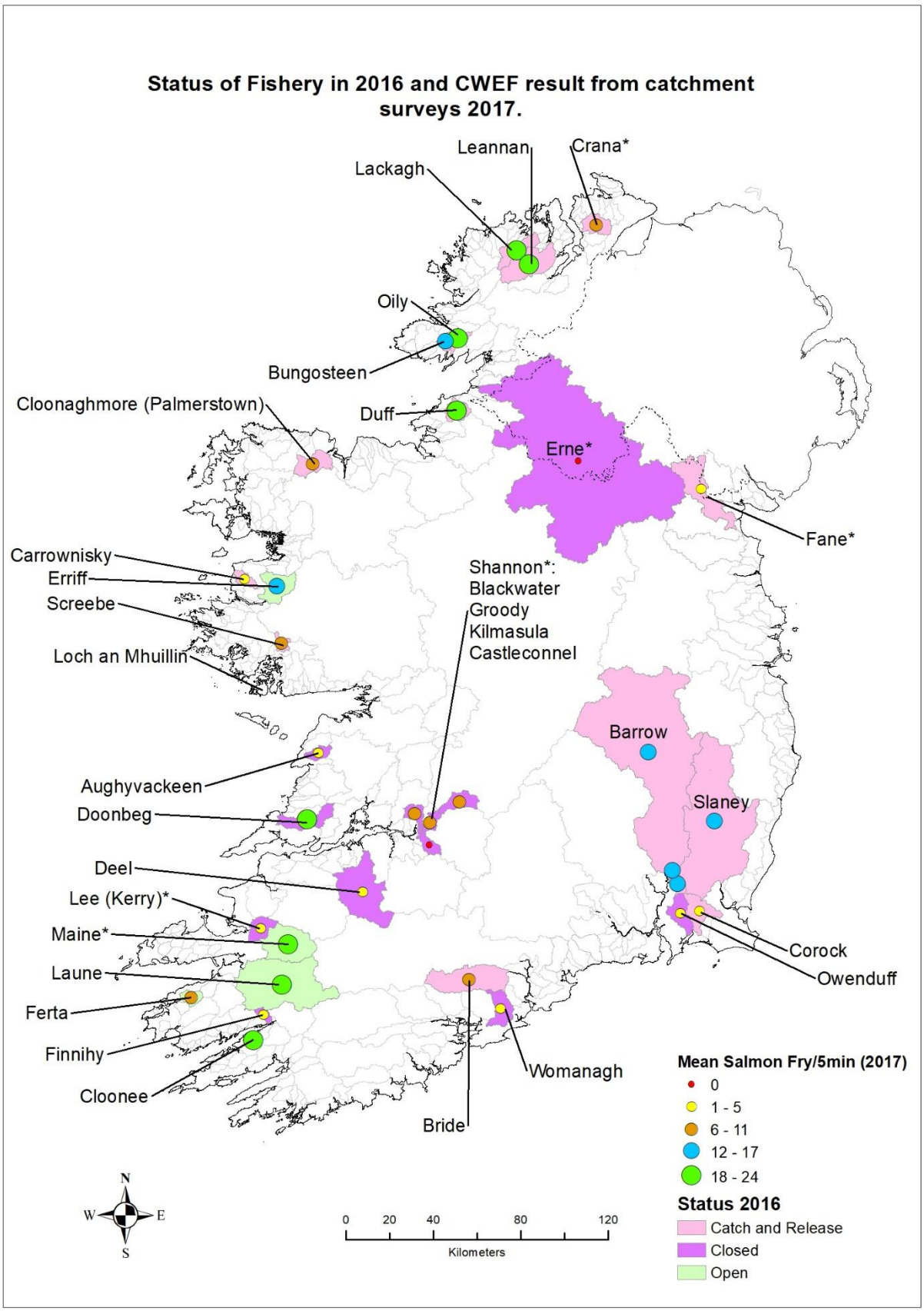
Trends in Salmon Fry Abundance over Time

Data in figures 2.2 and 2.3 present the catchment-wide electro-fishing mean abundances of salmon fry in 146 catchments where electro-fishing results are available; Figure 2.4 shows the current average salmon index for all catchments surveyed to date. Thirty-Six catchments have only one survey within the period used to calculate the CWEF index.

Highest salmon fry numbers were recorded in rivers in Kerry and Connemara. Generally, rivers along the east and south east coast recorded low salmon fry abundance. Low fry numbers were also recorded for rivers in the north-west and Donegal Bay; many of the smaller catchments along the west coast also had low numbers of fry.

A catchment-wide salmon fry average for rivers electro-fished from 2007 to 2017 is presented (Map 2.2).

Map 2.1: For rivers surveyed in 2017 the mean salmon fry per 5 minutes found in 2017 is indicated along with the fishery status during the 2016 fishing season.



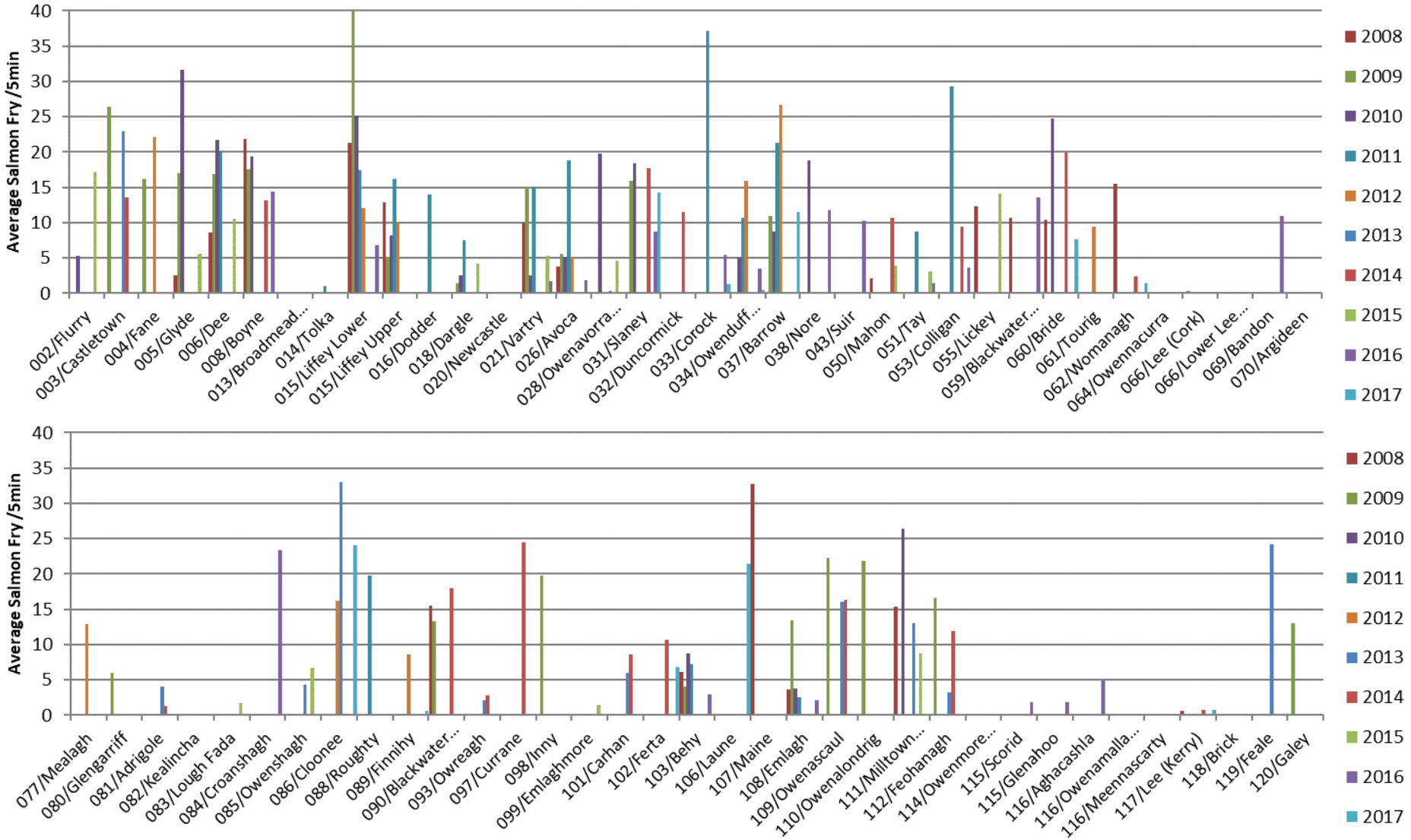


Fig 2.2: Annual Catchment-Wide Electrofishing results 2007-2017.

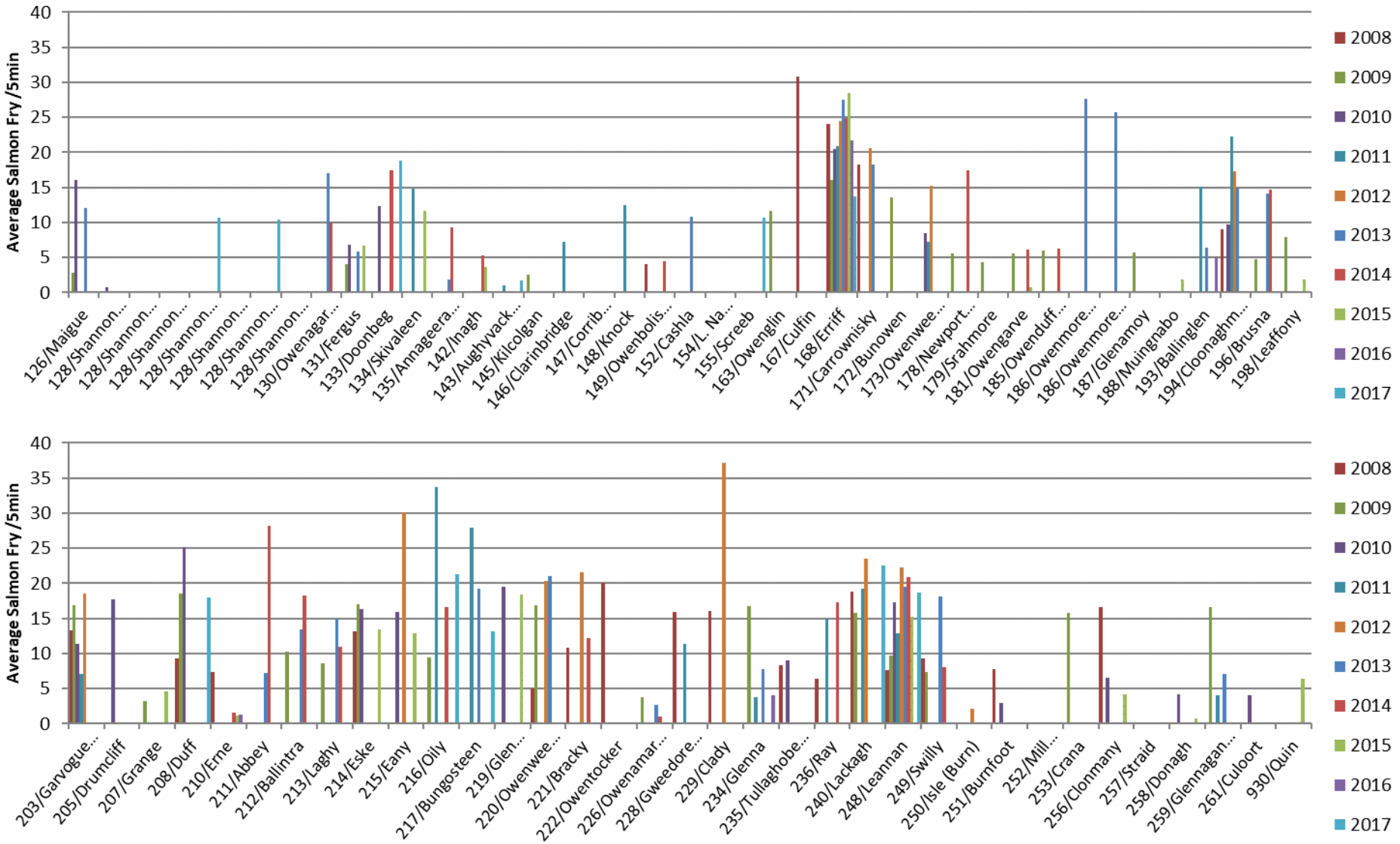


Fig 2.3: Annual Catchment-Wide Electrofishing results 2007-2017.

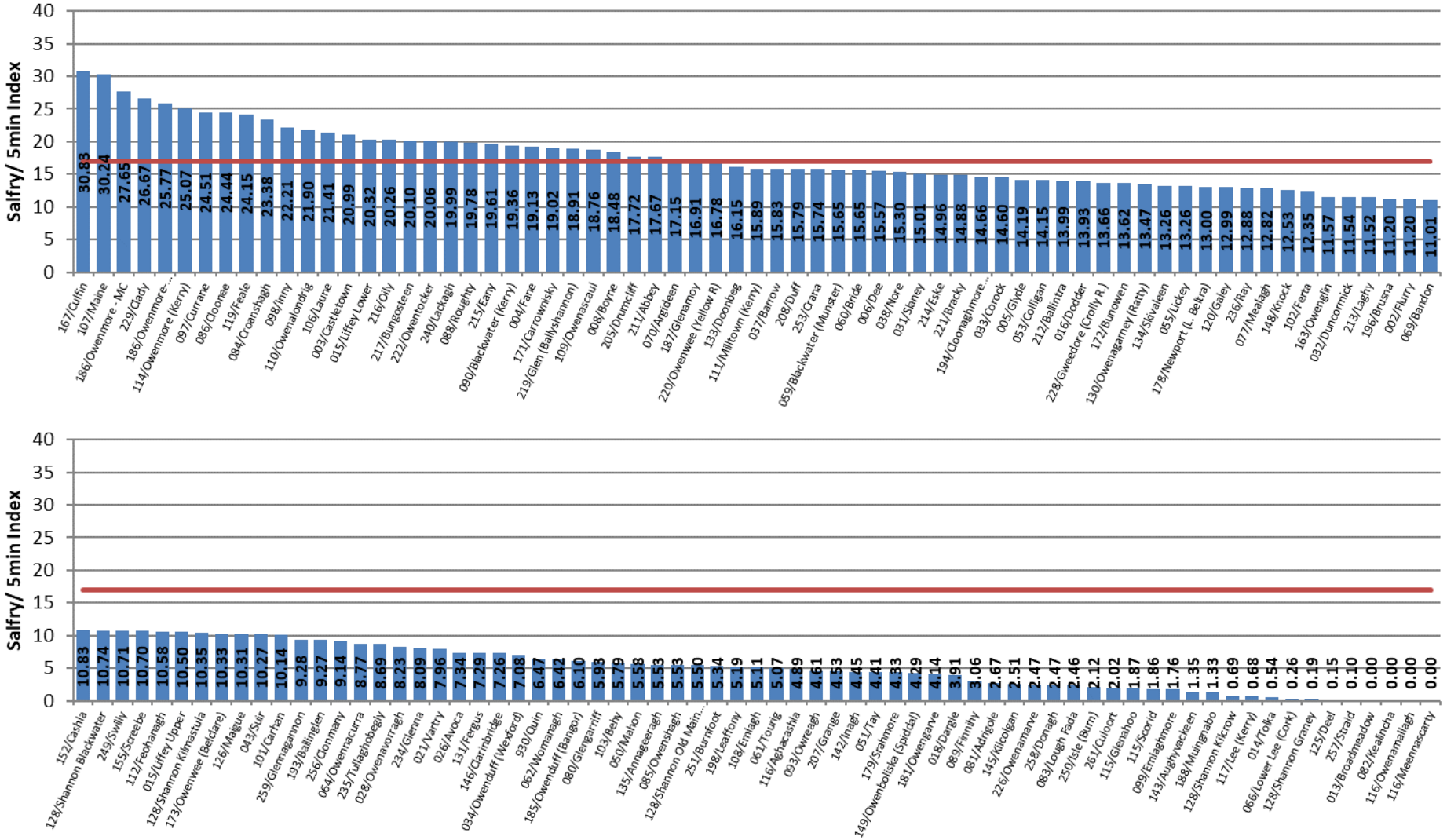
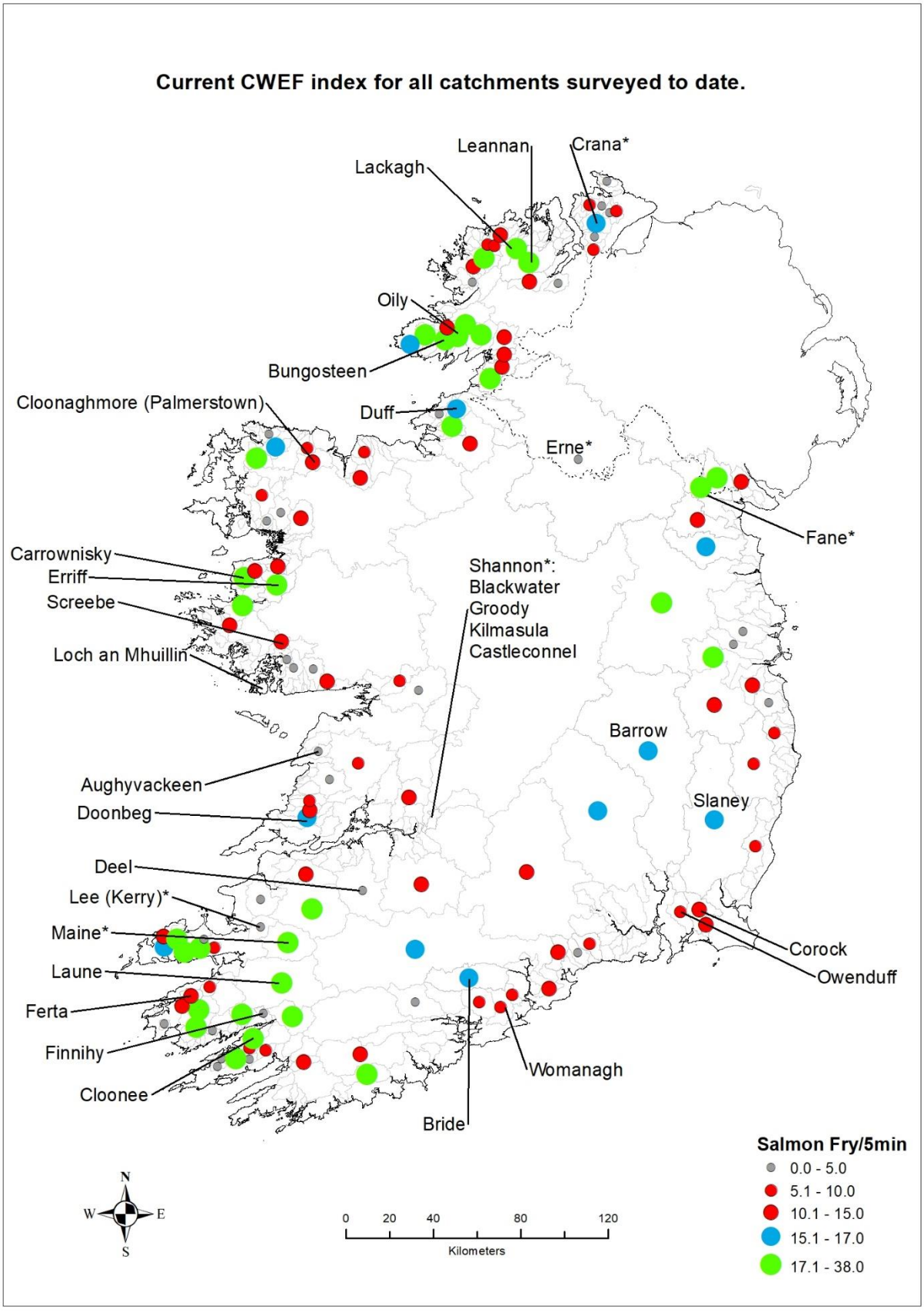


Figure 2.4: Current CWEF index (salmon fry per 5 minutes) for all catchments surveyed to date.


Current CWEF index for all catchments surveyed to date.
Leannan
Crana*
Lackagh
Oily
Bungosteen
Cloonaghmore (Palmerstown)
Duff
Erne*
Fane*
Carrownisky
Erriff
Screebe
Loch an Mhuillin
Shannon*:
Blackwater
Groody
Kilmasula
Castleconnel
Barrow
Slaney
Aughyvackeen
Doonbeg
Deel
Lee (Kerry)*
Maine*
Laune
Ferta
Finnihy
Cloonee
Bride
Womanagh
Corock
Owenduff
N
W
E
S
0 20 40 80 120
Kilometers
Salmon Fry/5min
0.0 - 5.0
5.1 - 10.0
10.1 - 15.0
15.1 - 17.0
17.1 - 38.0

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 in which the species occurs. For salmon, the marine phase is often the focus of recent 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 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 (Passive Integrated Transponder) 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 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 Salmonid Index Catchment) to provide a direct count of the numbers of returning tagged adult fish. Up to 3000 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 in February 2016. PIT tagging of smolts was initiated on the Erriff system in 2016. The majority of surviving adults were expected to return as 1 SW salmon (grilse) in 2017. Results will inform 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.

PIT tagging projects to monitor marine survival

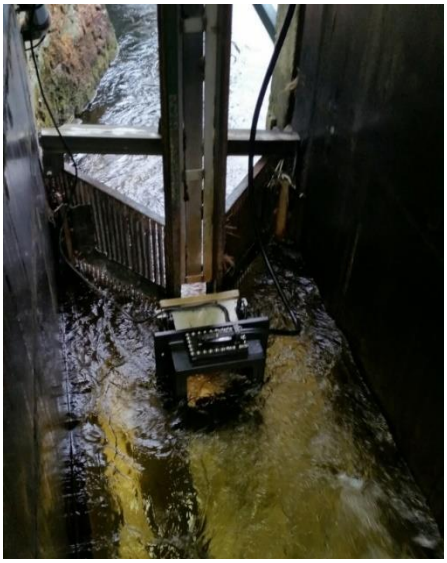


Fig 3.1. Erriff upstream trap with VAKI Riverwatcher counter and Biomark antenna (dark rectangular unit).

Following installation of the Biomark customised thin-walled shielded antenna and associated data logger in February 2016 (Fig 3.1) at the upstream fish trap in the River Erriff, a salmon smolt tagging project was initiated. Wild salmon smolts were captured and PIT tagged (Biomark HPT/APT 12 Pre-loaded) annually in spring since 2016 at two main sites on the system: 1) at Tawnyard trap located on the Black River tributary; and 2) on the main channel of the Erriff using a screw trap. A corresponding programme also commenced in the Corrib system in 2017, with smolts tagged at the Galway weir in advance of the installation of a similar PIT tag reader there in the Denil fish pass and associated submersible PIT tag antennae. The number of salmon smolts tagged in both systems and associated lengths data are presented in Table 3.1.

Smolt to adult salmon returns to the Erriff and Corrib systems

In 2017, a total of 30 PIT tagged adult salmon returned to the Erriff representing a provisional marine survival of 2.9% for the cohort tagged in 2016. Any multi-sea-winter fish which return in 2018 will have to be considered when finalising this estimate. A more comprehensive picture of salmon marine survival trends will become available when a more long-term time series of results are available.

Table 3.1. Number and lengths of salmon smolts PIT tagged in the Erriff and Corrib systems since 2016.

Year	Location	No. of fish tagged	Mean (cm)	SD (cm)	Min (cm)	Max (cm)
2016	Erriff	1022	12.5	1.5	8.7	18
2017	Erriff	553	12.8	1.6	10	21.6
2017	Corrib	1600	16.5	2.3	11.2	24.8

Table 3.2. PIT tag detections from returning adult salmon tagged in 2016.

Tagging year	Location	No. of smolts tagged	No. of returning adults detected	% marine survival
2016	Erriff	1022	30	2.9

Figures may be revised based on additional adult returns in following years.

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 be collected from any killed fish, the often complex make up of a population 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 the CL 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 the quality of the existing models and to improve the quality of the scientific advice, particularly for rivers where the stock structure is complicated (e.g. river has significant spring salmon and a grilse component or other stock components) or has changed, it is important to obtain data on the stock. Run-timing of the different components may influence harvesting options. Figure 4.2 shows the occurrences of fish of different sea-ages 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 from the commercial draft net fisheries and from anglers, building up a scale collection for analysis. To date the collection consists of scales of 8059 fish from 18 fisheries around the country. A sample of scales of these fish has been read.

Of the 1934 fish for which age has been determined, 669 of fish were Multi-sea winter fish (MSW), 1169 were grilse; the remaining 96 fish were previously spawned grilse (PSG). Of these three fish types the MSW were on average the largest, with a mean weight of 5.06 kg, PSG had an average weight of 4.78kg and grilse an average weight of 2.60kg. It can be seen on figure 4.1 that most of the grilse were below 4kg and all MSW and PSG were 4kg or above.

Table and Figure 4.1: Summary table and boxplots of Weights (kg) of salmon for which age has been determined by scale reading.

Fish Type	Mean	SD	n
Grilse	2.60	0.88	846
MSW	5.06	1.60	602
PSG	4.78	1.88	70
Total			1518

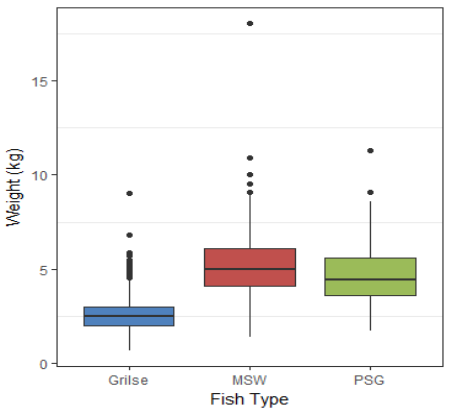


Table 4.2: Summary of Scale collection from adult fish caught 2005 to 2017 at various locations throughout Ireland. †- Common estuaries, ‡- Includes scales found to be unreadable.

		Fisher Type			Length Weight Information						Dates Fish Captured	
River	Year	Angling	Commercial or Scientific	Illegal Net	None	Length & Weight	Length only	Weight Only	Grand Total	Aged/ Examined	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	134	132	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	186	101	18/06/2013	25/09/2013
Cashen	2017		157			135	21	1	157	37	28/05/2017	31/07/2017
Castlemaine Harbour†	2010		785			785			785	163	10/06/2010	28/08/2010
Castlemaine Harbour†	2013		238		54	32	6	146	238	28	03/05/2013	30/07/2013
Castlemaine Harbour†	2017		9		9				9		11/07/2017	18/07/2017
Castlemaine Harbour†	2016		36		1	5	30		36	34	15/06/2016	28/07/2016
Cork Harbour	2013		142		21	80	1	40	142	25	16/05/2013	01/08/2013
Cork Harbour	2017		54			54			54	27	18/05/2017	14/07/2017
Cork Harbour	2016		129		2	103	17	7	129	42	01/06/2016	15/09/2016
Corrib	2012	1				1			1	1	09/03/2012	09/03/2012
Corrib	2014	385				372	10	3	385	50	02/04/2014	22/08/2014
Corrib	2015	708				708			708	176	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	9	6	26/06/2013	02/07/2013
Laune	2013		18		18				18		07/06/2013	10/07/2013
Laune	2017		12				12		12	12	14/06/2017	10/07/2017
Mulkear	2017	2		9		10	1		11	11		
Nore	2009	2	42		2	16	22	4	44	44	03/08/2009	29/09/2009
Nore	2010	4	87		6	80		5	91	78	05/07/2010	30/09/2010
Nore	2011	1	1205		5	1182	8	11	1206	143	12/05/2011	12/08/2011
Nore	2012	2	357	2		351		10	361	76	10/05/2012	15/09/2012
Nore	2013	1	1471		9	1404	23	36	1472	81	14/05/2013	18/06/2014
Nore	2014		498			484	2	12	498			
Owenmore - Ballinahinch	2006		18				18		18	17	00/01/1900	00/01/1900
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	00/01/1900	00/01/1900
Sneem	2011	18				7		11	18	17	21/05/2011	17/09/2011
Suir	2010	8		2		9	1		10	8	12/08/2010	21/10/2010
Suir	2011	2	480		2	448	8	24	482	111	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		10	9	01/08/2009	03/11/2009
Waterford Estuary†	2010	7	459		2	20	444		466	296	14/07/2010	27/10/2010
Grand Total		1418	6634	14	142	6701	666	557	8066	1971‡		

Figure 4.1: The number of salmon scales in the sample collection by week of capture (where known)(n=6948).

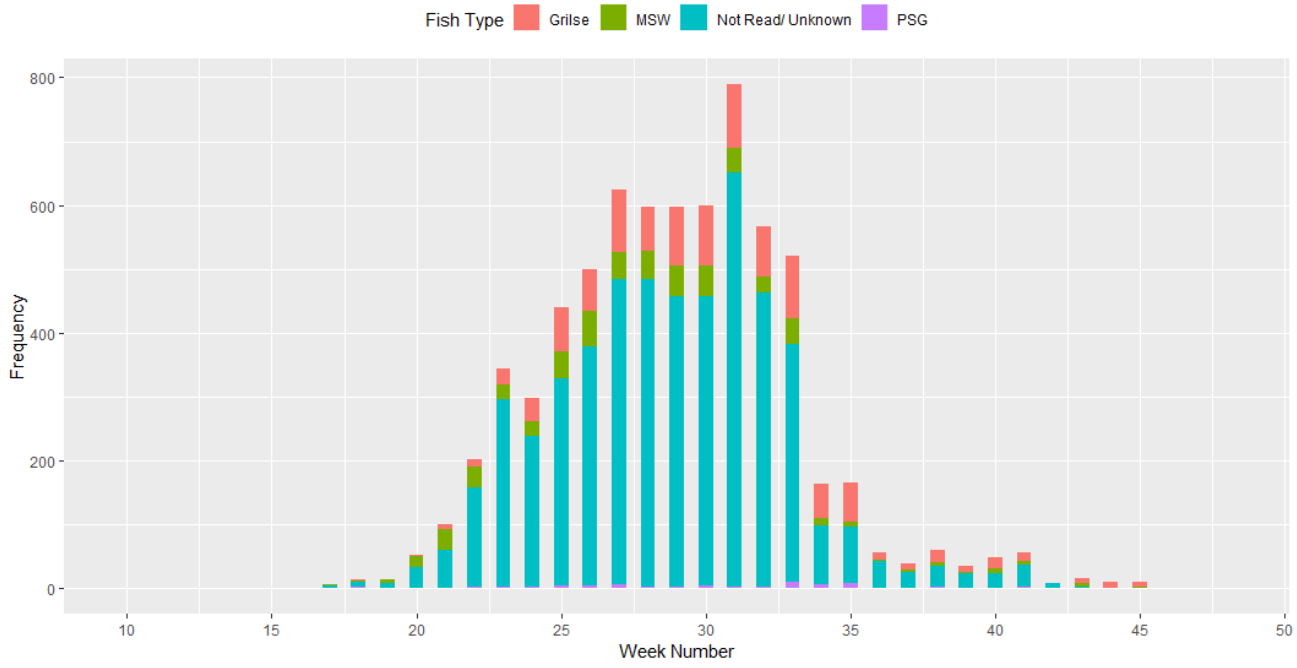


Figure 4.2: Boxplots of weight (kg) of fish life history in different catchments 2005-2017, where both age and weight are known, total=1518.

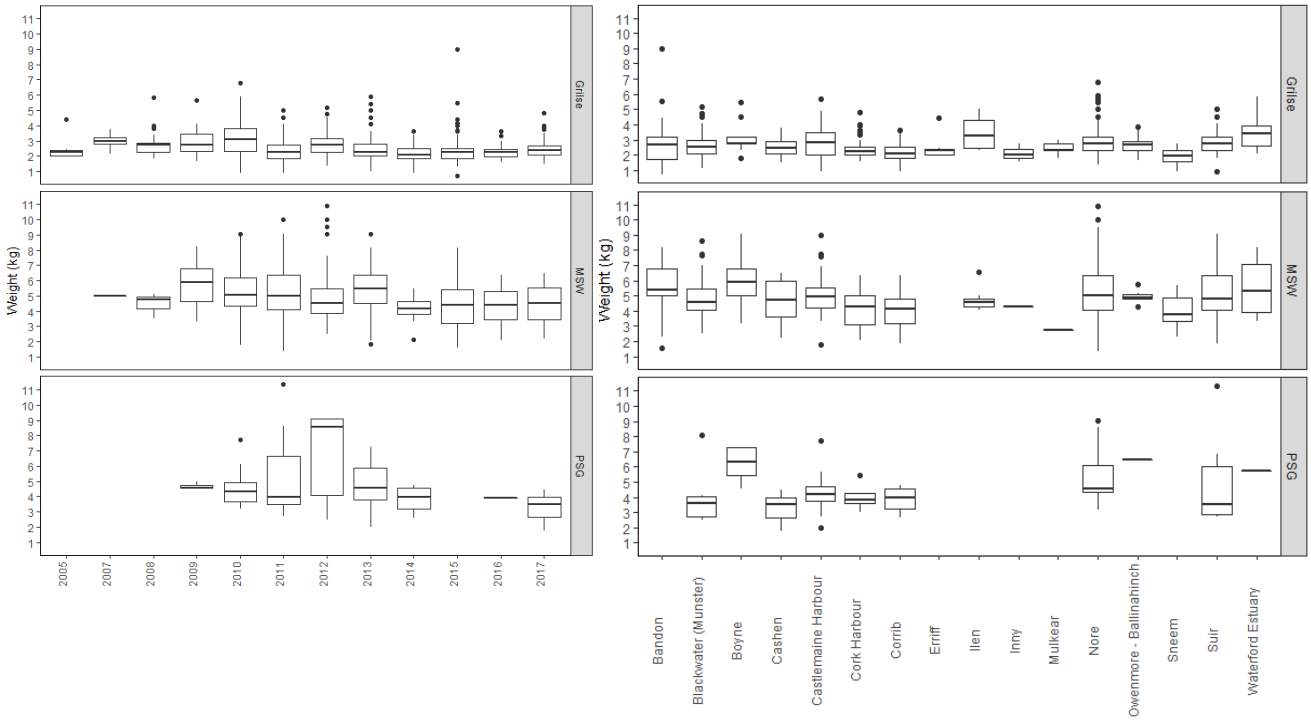
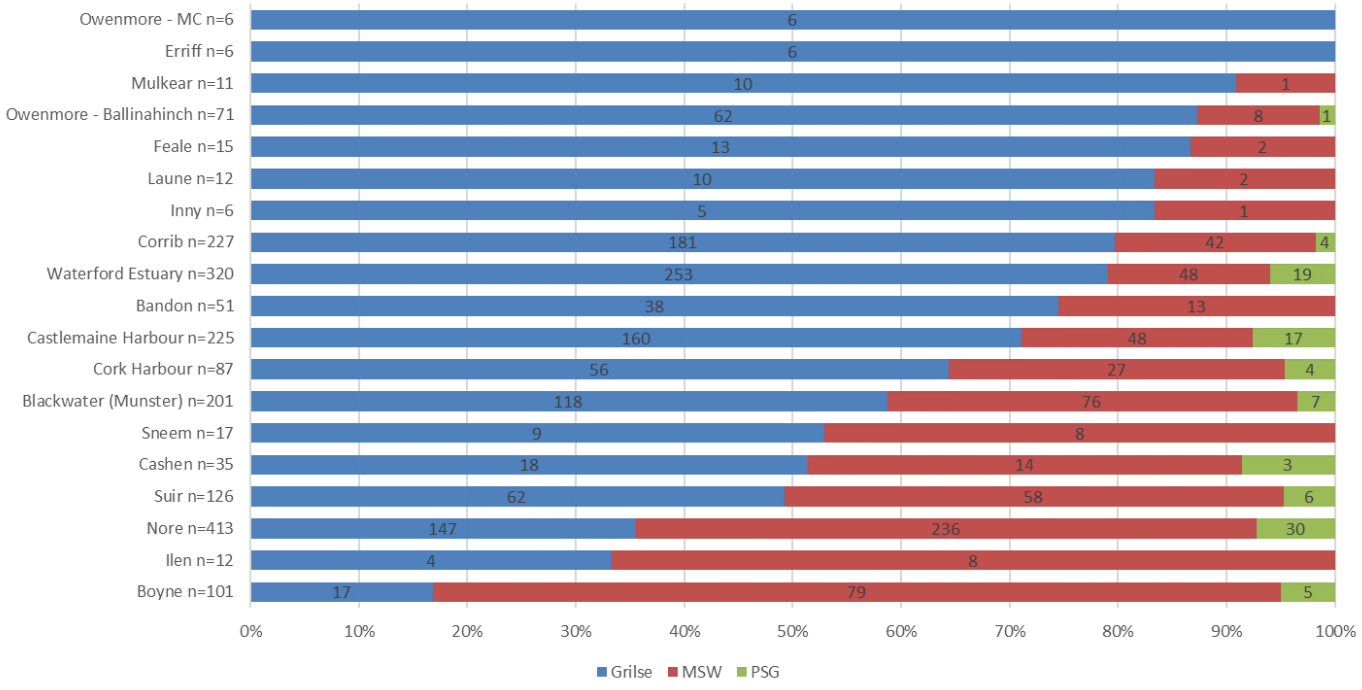
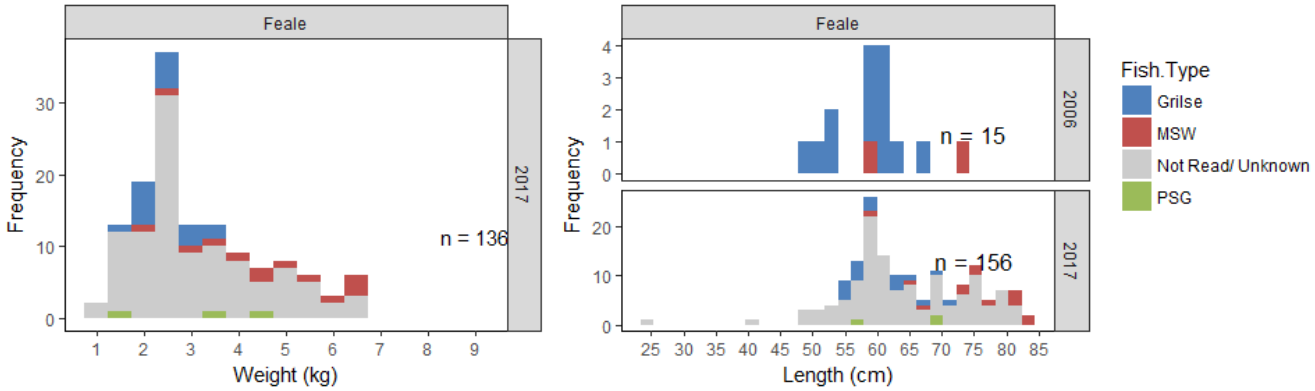


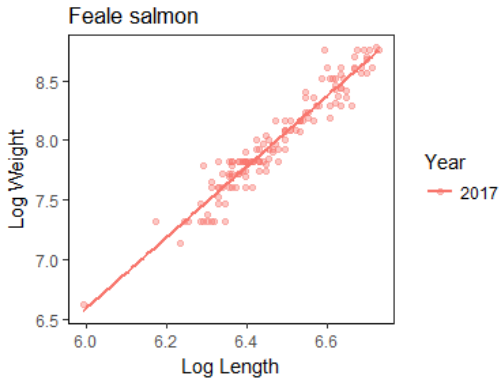
Figure 4.3: Occurrence of fish life history in different catchments 2005-2017 (n=1942).



Comparison of Size and Age profile of Feale Salmon over time.

Commercial fishermen in on the Cashen estuary, which is the outflow of the Feale River, returned scales from 157 fish. Of these 135 had both length and weight information, these showed a strong length weight relationship. Age was determined by scale reading for 35 salmon, this found that 51% were grilse, 40% MSW and 9% PSG. The mean weight of MSW salmon was 4.7kg (standard deviation 1.46kg, n=13), grilse had a mean weight of 2.52kg (sd 0.59, n=17), Previously spawned grilse had a mean weight of 3.32kg (sd 1.37, n=3).

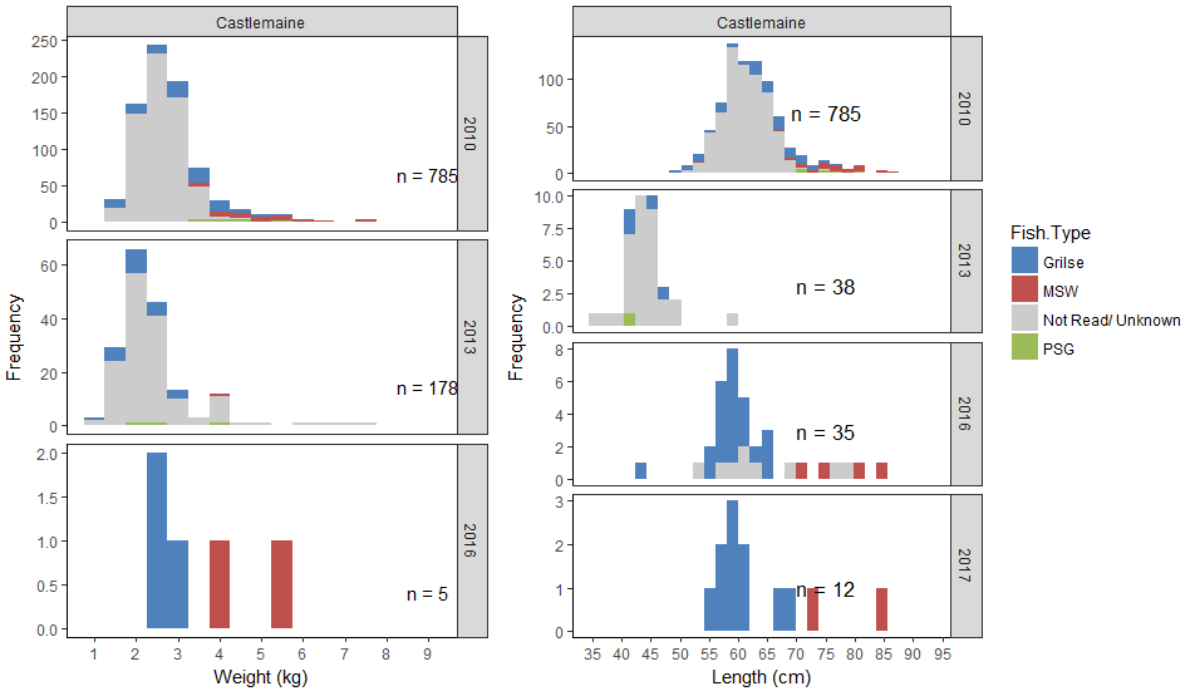


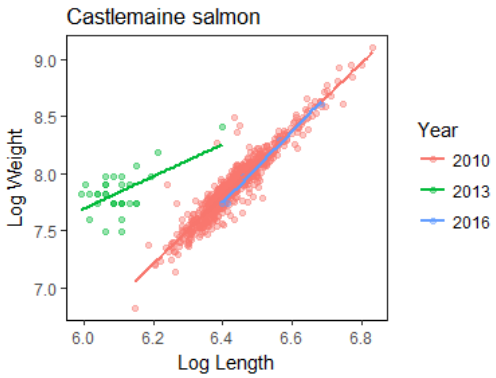


Year	n
2017	135

Comparison of Size and Age profile of Castlemaine Harbour Salmon over time.

Commercial fishermen in the Castlemaine harbour returned scales from 9 fish, no length or weigh data was recorded for those fish. Scales of a further 12 fish were returned from within the Laune river, for which length information was recorded. Age was determined by scale reading for the 12 Laune salmon, this found that 83% were grilse and 17% MSW. The mean length of MSW salmon was 60.9cm (standard deviation 4.2cm, n=10), grilse had a mean length of 79cm (sd 8.5, n=2), there were no PSG. As no fish weights were recorded a length weight model derived from pooling data from 2010 and 2016 fish was constructed, this was used to calculate the expected weight of the fish. The mean calculated weight of MSW salmon was 5.5 kg (sd 1.71, n=2), grilse had a mean calculated weight of 2.56kg (standard deviation 0.54, n=10).

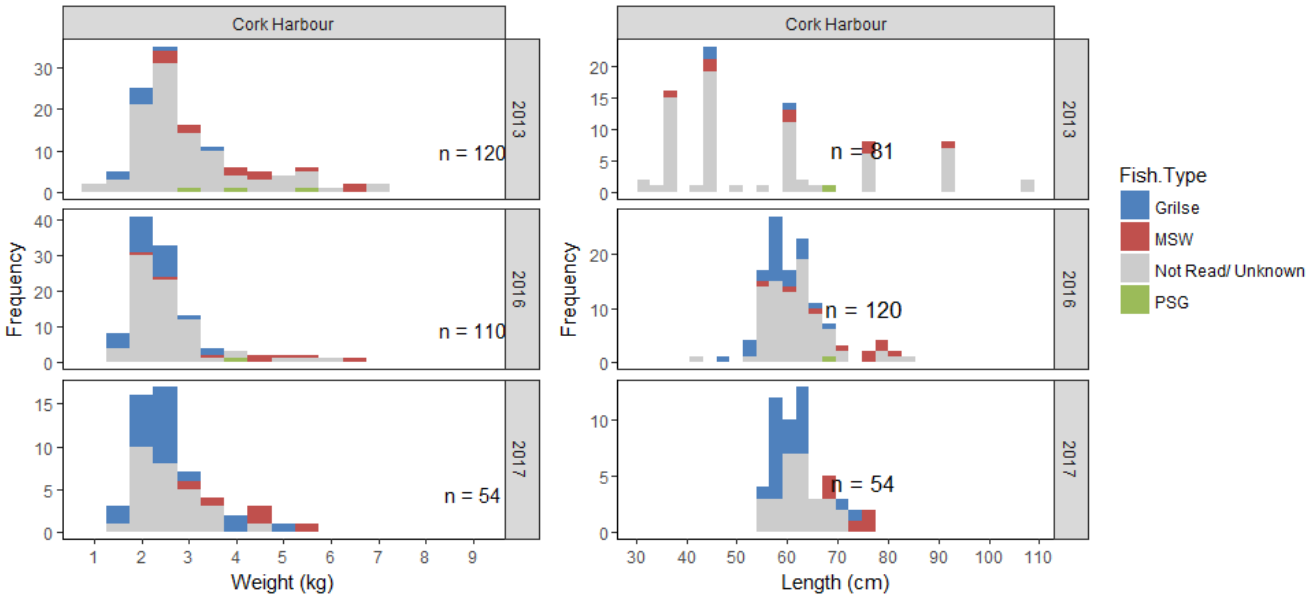


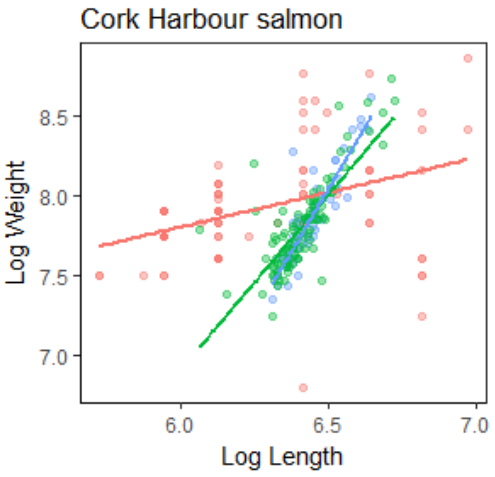


Year	n
2010	785
2013	32
2016	5

Comparison of Size and Age profile of Cork Harbour Salmon over time.

Commercial fishermen in Cork Harbour, returned scales from 54 fish, all had both length and weight information, these exhibited a well-defined length weight relationship. The age of 26 salmon was determined by scale reading, this found that 81% were grilse and 19% MSW. The mean weight of MSW salmon was 4.28kg (standard deviation 0.92kg, n=5), grilse had a mean weight of 2.52kg (sd 0.8kg, n=21).

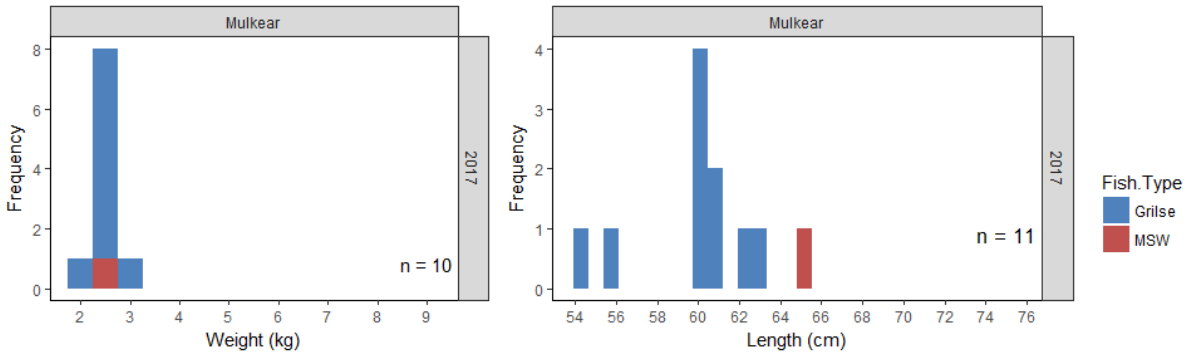


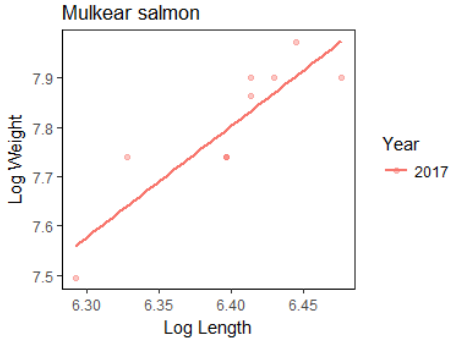


Year	n
2013	80
2016	103
2017	54

Comparison of Size and Age profile of Mulkear Salmon.

A small number of salmon scales were returned from fish from the Mulkear river, these fish originated from seizures by fisheries officers and two from anglers. The age of all the fish was determined by scale reading, 10 (91%) fish were grilse with a mean weight of 2.43kg (sd0.33, n=9), the remaining fish was a multi=sea winter fish weighing 2.7 kg.





Year	n
2017	10

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Appendices:

A. Catchment Wide Electrofishing Results.

Data are presented for rivers electro-fished in each River Basin District in 2017. Results of any previous catchment wide electro-fishing surveys undertaken over the 2007-2017 period are also shown. Data is presented on the Current CWEF index and the number of surveys considered in the index calculation.

A.1.Neagh Bann International River Basin District.

Summary

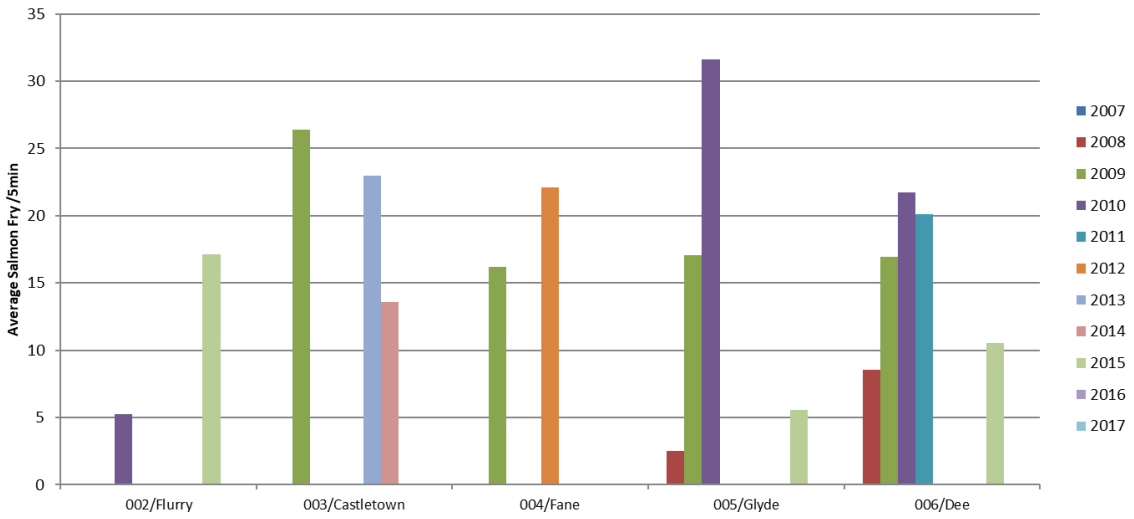
Since 2007, five salmon rivers have been surveyed in the Neagh Bann International River Basin District (NBIRBD) as part of the on-going catchment-wide electrofishing surveys. These are presented in (Table A.1.1). At present two rivers are meeting the threshold of 17 salmon fry per 5min. A limited survey of the Fane was undertaken in 2017.

Table A.1.1: Catchment-wide Electrofishing data for the Eastern River Basin District 2007-2017 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

	Survey Year												
Code/River	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Current Index**	**# Annual Surveys Considered**
002/Flurry				5.24					17.15			11.20	2
003/Castletown			26.41				22.96	13.59				20.99	3
004/Fane			16.17			22.09			8.94†		0.5†	19.13	2
005/Glyde		2.49	17.08	31.61					5.56			14.19	4
006/Dee		8.55	16.92	21.72	20.13				10.51			15.57	5

Bold annual figures indicate years included in calculation of current CWEF index.
Underlined index figures indicate those exceeding the 17 salmon fry threshold.
† Incomplete surveys not included in calculation of current index.

Figure A.1.1: Summary of CWEF results in Neagh Bann international River basin district 2007-2017.



A.1.1. River Fane

IFI Salmon Catchment #: 8
2017 survey dates: 28/8/17
Mean Salmon Fry/5 min (2017): - fry/5min.
CWEF Index: 19.13 fry/5min.

Sampling carried out by:
Donal McSweeney
Josie Mahon
Mick Millane
Ronan McCormick

Fish Species Present:
Brown Trout
European Eel
Stone Loach

Figure A.1.1.1: Length distribution of salmon captured in 2017 CWEF survey on the Fane Catchment.

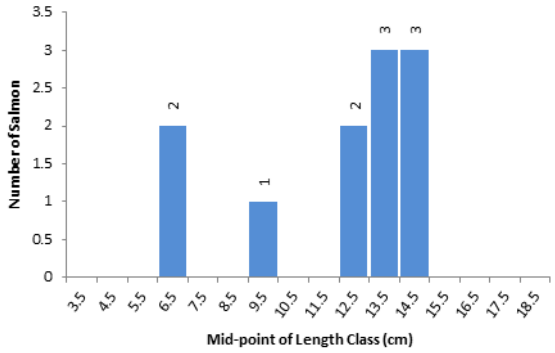


Figure A.1.1.2: Comparison of mean salmon fry/5min for all surveys on the Fane catchment to 2017.

Table A.1.1.1: Conservation limits and provisional returns on the Fane catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	542	222	Open							
2008	2009	542	214	Open	5	2				15.80	16.17
2009	2010	542	273	Open							
2010	2011	542	387	Open							
2011	2012	542	603	Open	7			7		7.90	22.09
2012	2013	542	816	Open							
2013	2014	1172	264	Open							
2014	2015	1176	411	Open	2			9			8.94*
2015	2016	1176	58	Brown Tag							
2016	2017	1176	-241	C&R	4			1			0.50*

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; * = Incomplete Surveys.

The survey consisted of just 5 sites fished on the 28th August, it concentrated on sites upstream and downstream of the Art Hamyl weir and was too brief to be used to calculate a CWEF figure. Just two salmon fry were found, both at one site immediately downstream of the weir. Previous surveys had recorded good numbers of fry at sites 4 and 5 downstream of weir and no fry above the weir. Salmon parr were encountered at all four sites fished up and downstream of the weir. Previous surveys had found no parr above the weir.

Table A.1.1.2: Site specific results of CWEF on the Fane catchment in 2017.

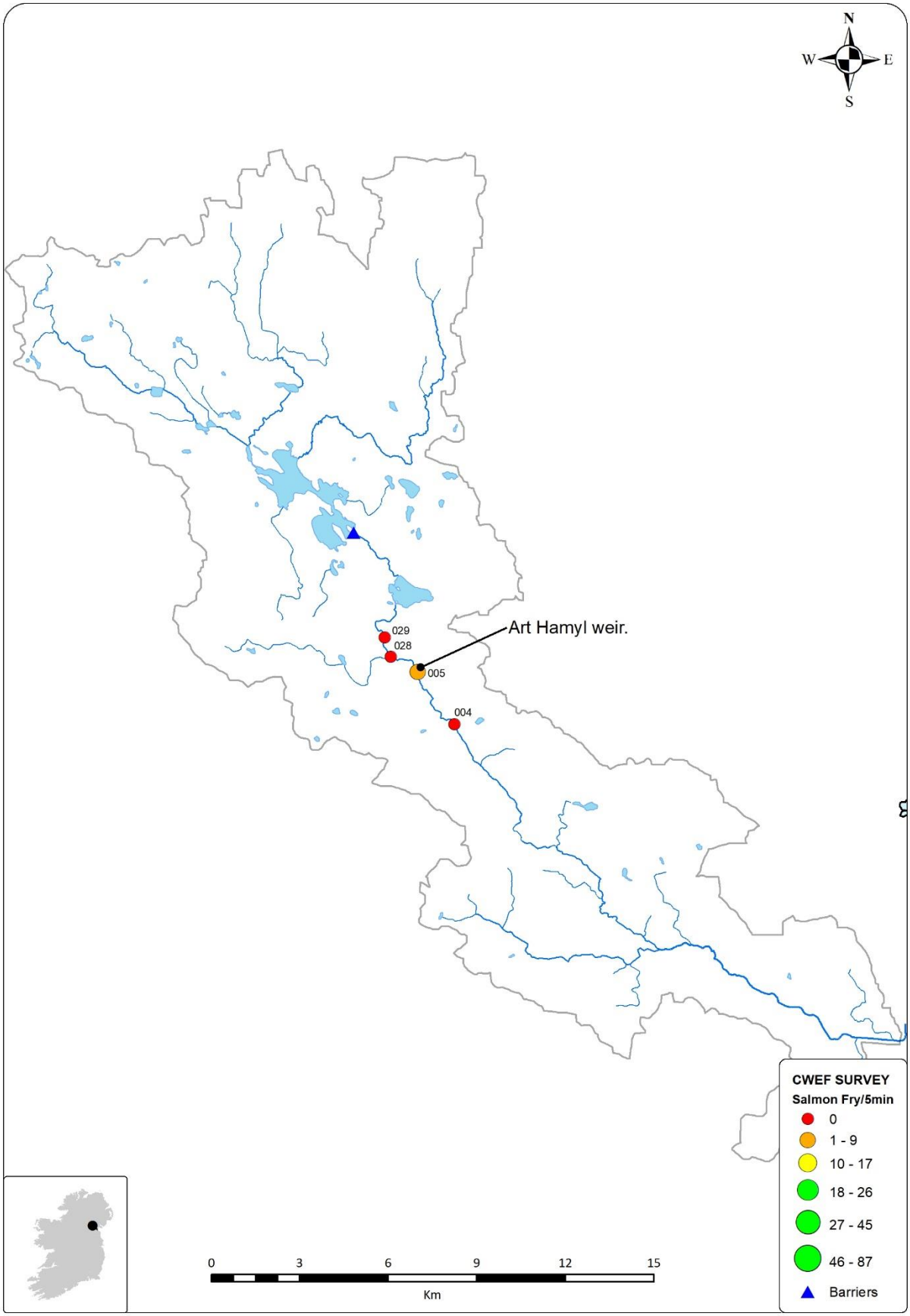
Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
004	H 89870 11167	2	1	3	0	Include	5.00	0.00
005	H 88635 12938	2	1	3	2	Include	3.00	2.00
027	H 88598 13046	3	0			Not Fished		
028	H 87724 13447	3	2	0	0	Include	0.00	0.00
029	H 87509 14111	3	1	0	0	Include	0.00	0.00

Table A.1.1.3: Site specific results of CWEF on the Fane catchment in current and previous CWEF surveys.

	Salmon fry Captured			
	Year			
Site #	2009	2012	2015	2017
004	22	17	-	0
005	0	34	9	2
027	-	-	0	-
028	-	-	0	0
029	-	-	0	0

	Salmon Parr Captured			
	Year			
Site #	2009	2012	2015	2017
004	24	11	-	2
005	1	13	2	1
027	-	-	0	-
028	-	-	0	1
029	-	-	0	5

Map A.1.1.1: Showing locations of 2017 survey sites on Fane River.



A.2.Eastern River Basin District.

Summary

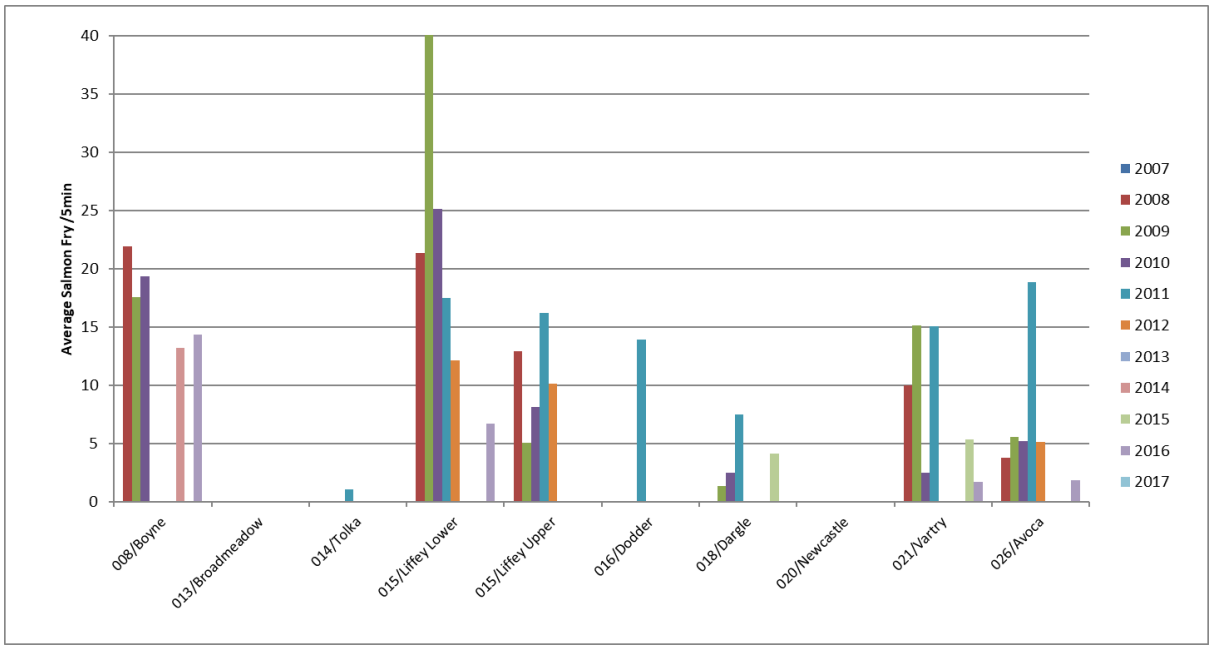
Since 2007, nine salmon rivers have been surveyed in the Eastern River Basin District (ERBD) as part of the on-going catchment-wide electrofishing surveys. These are presented in (Table A.2.1). At present two rivers, the Boyne and the Fane are meeting the threshold of 17 salmon fry per 5min. No CWEF surveys were undertaken in this region in 2017.

Table A.2.1: Catchment-wide Electrofishing data for the Eastern River Basin District 2007-2017 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

	Survey Year												
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Current Index	# Annual Surveys Considered
008/Boyne		**21.91**	**17.54**	**19.38**				**13.21**		**14.37**		17.28	5
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**				**6.75**		20.32	5
015/Liffey Upper		**12.93**	**5.11**	**8.15**	**16.20**	**10.13**				**2.63**		8.44	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**	**1.75**		7.96	5
026/Avoca		**3.79**	**5.56**	**5.20**	**18.88**	**5.15**				**1.89**		7.34	5

Bold annual figures indicate years included in calculation of current CWEF index.
Underlined index figures indicate those exceeding the 17 salmon fry threshold.
† Incomplete surveys not included in calculation of current index.

Figure A.2.1: Summary of CWEF results in Eastern River basin district 2007-2017 (no surveys in 2017).



A.3.South Eastern River Basin District.

Summary

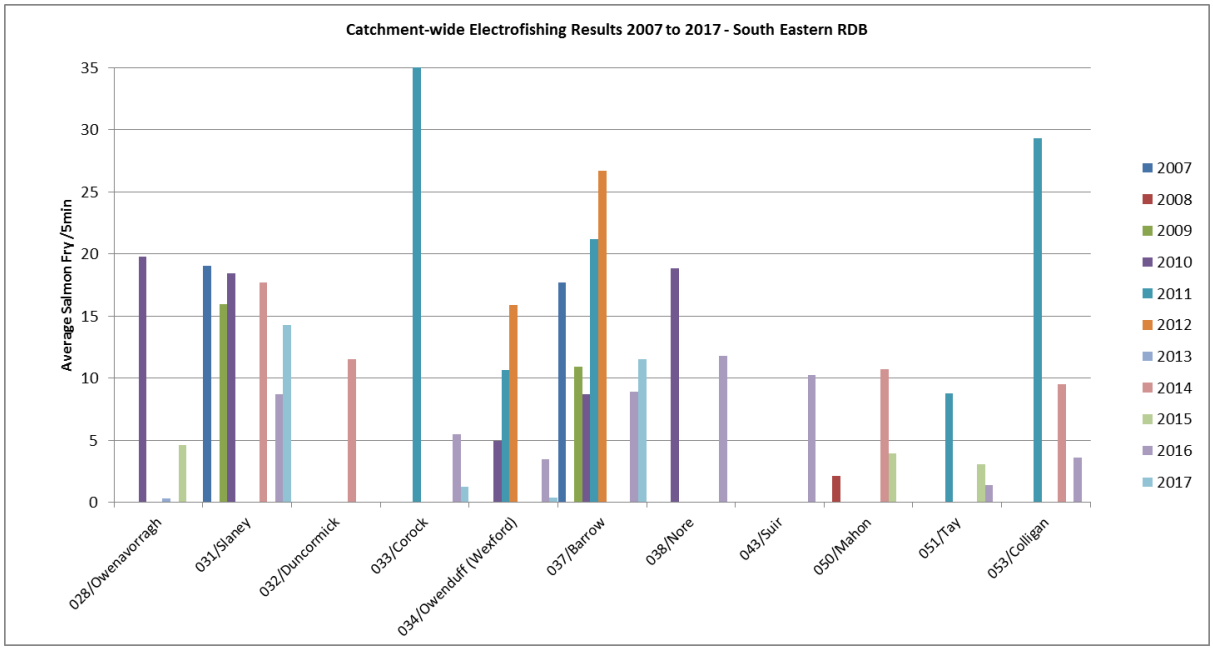
Since 2007, eleven salmon rivers have been surveyed in the South Eastern River Basin District (SERBD) as part of the on-going catchment-wide electrofishing surveys. These are presented in (Table A.3.1). At present no rivers are meeting the threshold of 17 salmon fry per 5min. In this region in 2017 CWEF surveys were undertaken in the Slaney, Corock, Owenduff and Barrow rivers.

Table A.3.1: Catchment-wide Electrofishing data for the South Eastern River Basin District 2007-2017 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

	Survey Year												
Code/River	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Current Index**	**# Annual Surveys Considered**
028/Owenavorragh				**19.76**			**0.33**		**4.61**			8.23	3
031/Slaney	19.05		**15.94**	**18.42**				**17.68**		**8.70**	**14.30**	15.01	5
032/Duncormick								**11.5***					
033/Corock					**37.11**					**5.47**	**1.23**	14.60	3
034/Owenduff				**4.97**	**10.65**	**15.91**				**3.47**	**0.40**	7.08	5
037/Barrow	17.72		**10.93**	**8.71**	**21.23**	**26.72**					**11.54**	15.83	5
038/Nore				**18.83**						**11.77**		15.30	2
043/Suir										**10.27**		10.27	1
050/Mahon		**2.11**						**10.72**	**3.92**			5.58	3
051/Tay					**8.75**				**3.07**	**1.40**		4.41	3
053/Colligan					**29.32**			**9.50**		**3.62**		14.15	3

Bold annual figures indicate years included in calculation of current CWEF index.
Underlined index figures indicate those exceeding the 17 salmon fry threshold.
† Incomplete surveys not included in calculation of current index.

Figure A.3.1: Summary of CWEF results in South Eastern River basin district 2007-2017.



A.3.1. River Slaney

IFI Salmon Catchment #: 31
2017 survey dates: 25/7/17- 30/09/017
Mean Salmon Fry/5 min (2017): 14.30 fry/5min.
CWEF Index: 15.01 fry/5min.

Sampling carried out by:
Josh Dunne
Michael Farnam
Morgan Rowsome
Myle Roban

Fish Species Present:
Brown Trout
European Eel
Lamprey sp.
Minnow
Roach
Stone Loach
Three Spined Sitcleback

Figure A.3.1.1: Length distribution of salmon captured in 2017 CWEF survey on the Slaney Catchment.

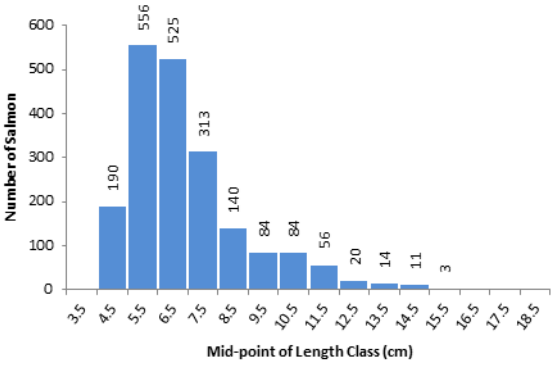


Figure A.3.1.2: Comparison of mean salmon fry/5min for all surveys on the Slaney catchment to 2017.

Table A.3.1.1: Conservation limits and provisional returns on the Slaney catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	5234	-1236	Catch Release							
2008	2009	828	490	Catch Release	31	17				18.04	15.94
2009	2010	923	33	Catch Release	79					10.96	18.42
2010	2011	609	-202	Catch Release							
2011	2012	609	-282	Catch Release							
2012	2013	609	-208	Catch Release							
2013	2014	917	-741	Catch Release	99	22				7.16	17.68
2014	2015	915	-770	Catch Release							
2015	2016	915	-830	Catch Release	122	14		1		6.32	8.70
2016	2017	915	-821	Catch Release	135					6.37	14.30

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; * = Incomplete Surveys.

This, the fifth complete CWEF survey of this catchment in the 2007 to 2017 period, was carried out between July and Sept 2017. The survey comprised 134 sites, all of which of which were included in the analysis. Salmon fry were present at 122 sites. The maximum fry catch was 42 salmon at site 127. The mean catch of included sites was 14.30 salmon fry/5min. The modal length category of 0+ fry caught was 5.5cm.

Conclusion

The Slaney had a mean catch of 14.3 salmon fry/5min in 2017. Taking the five most recent surveys into account this results in a cumulative average of 15.01 salmon fry/5min which is below the 17 salmon fry threshold.

Table A.3.1.2: Site specific results of CWEF on the Slaney catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	S 94290 52607	2	2	1	8	Include	1.11	8.89
002	S 87441 90777	4	1	0	16	Include	0.00	22.00
003	S 93646 93769	4	2	0	15	Include	0.00	18.00
004	S 97670 93867	4	1	0	26	Include	0.00	31.00
005	T 06529 52250	4	1	1	0	Include	1.00	0.00
006	T 07445 53249	4	1	0	6	Include	0.00	7.00
007	S 89647 54844	3	1	1	12	Include	1.31	15.69
008	S 95050 92400	3	1	0	16	Include	0.00	18.00
009	S 98790 95029	3	2	1	16	Include	1.24	19.76
011	S 99763 84455	4	1	0	13	Include	0.00	17.00
014	S 95409 80761	4	1	0	18	Include	0.00	20.00
015	S 94417 80422	4	1	5	17	Include	6.82	23.18
016	S 99608 85859	4	1	1	14	Include	1.27	17.73
017	S 96096 94786	4	1	0	28	Include	0.00	30.00
018	S 94156 94384	4	1	0	28	Include	0.00	32.00
019	S 93369 93120	4	1	0	20	Include	0.00	27.00
020	S 91635 93905	4	1	0	11	Include	0.00	16.00
022	S 88928 59755	2	1	19	1	Include	22.80	1.20
023	S 88110 60347	2	1	0	12	Include	0.00	15.00
024	S 89211 59376	2	1	8	4	Include	10.00	5.00
025	S 96144 92379	3	1	1	14	Include	1.13	15.87
026	S 95683 92485	3	1	3	13	Include	4.13	17.88
027	S 93582 93103	3	1	0	14	Include	0.00	22.00
028	T 11567 68172	3	2	4	0	Include	5.00	0.00
029	T 12564 66811	3	1	5	4	Include	5.56	4.44
030	T 12207 64339	3	1	6	0	Include	6.00	0.00
031	T 09279 60004	3	2	0	0	Include	0.00	0.00
032	T 03092 49217	4	1	0	6	Include	0.00	8.00
033	S 90820 94898	3	1	2	22	Include	2.67	29.33
034	S 91251 96522	3	1	3	3	Include	4.00	4.00
035	S 91681 96040	2	1	4	4	Include	5.50	5.50
036	S 90763 94873	3	1	4	17	Include	5.52	23.48
038	S 84251 37840	3	1	1	0	Include	2.00	0.00
039	S 84742 37710	3	1	10	3	Include	12.31	3.69
040	S 85887 37990	3	2	5	2	Include	6.43	2.57
041	S 87119 37379	3	1	2	5	Include	2.57	6.43
042	S 87693 36443	4	1	4	2	Include	4.67	2.33
044	S 95717 36463	4	1	0	4	Include	0.00	6.00
046	S 91936 61416	5	1	9	20	Include	10.24	22.76
048	S 98993 67358	5	1	5	20	Include	5.80	23.20
049	T 01389 69267	5	1	6	14	Include	7.20	16.80
051	T 03870 72471	3	1	1	18	Include	1.16	20.84
052	T 02119 48454	4	1	1	2	Include	1.33	2.67
053	S 99923 84249	4	2	0	20	Include	0.00	27.00
055	S 85247 68469	4	2	15	15	Include	17.00	17.00
056	S 87709 62686	3	1	1	0	Include	2.00	0.00
057	S 93983 63261	2	2	8	17	Include	9.28	19.72
058	T 09362 57490	4	1	0	13	Include	0.00	15.00
059	T 12057 62107	4	1	0	0	Include	0.00	0.00
060	T 10829 59100	3	1	6	0	Include	6.00	0.00
061	T 11342 59329	4	1	0	2	Include	0.00	2.00
062	S 93669 84172	4	1	5	12	Include	5.00	12.00
063	T 00793 43835	3	1	3	5	Include	3.75	6.25
064	S 88129 86523	4	1	0	29	Include	0.00	37.00
065	S 87003 88171	4	1	2	34	Include	2.56	43.44
067	S 88827 85649	4	1	0	28	Include	0.00	36.00

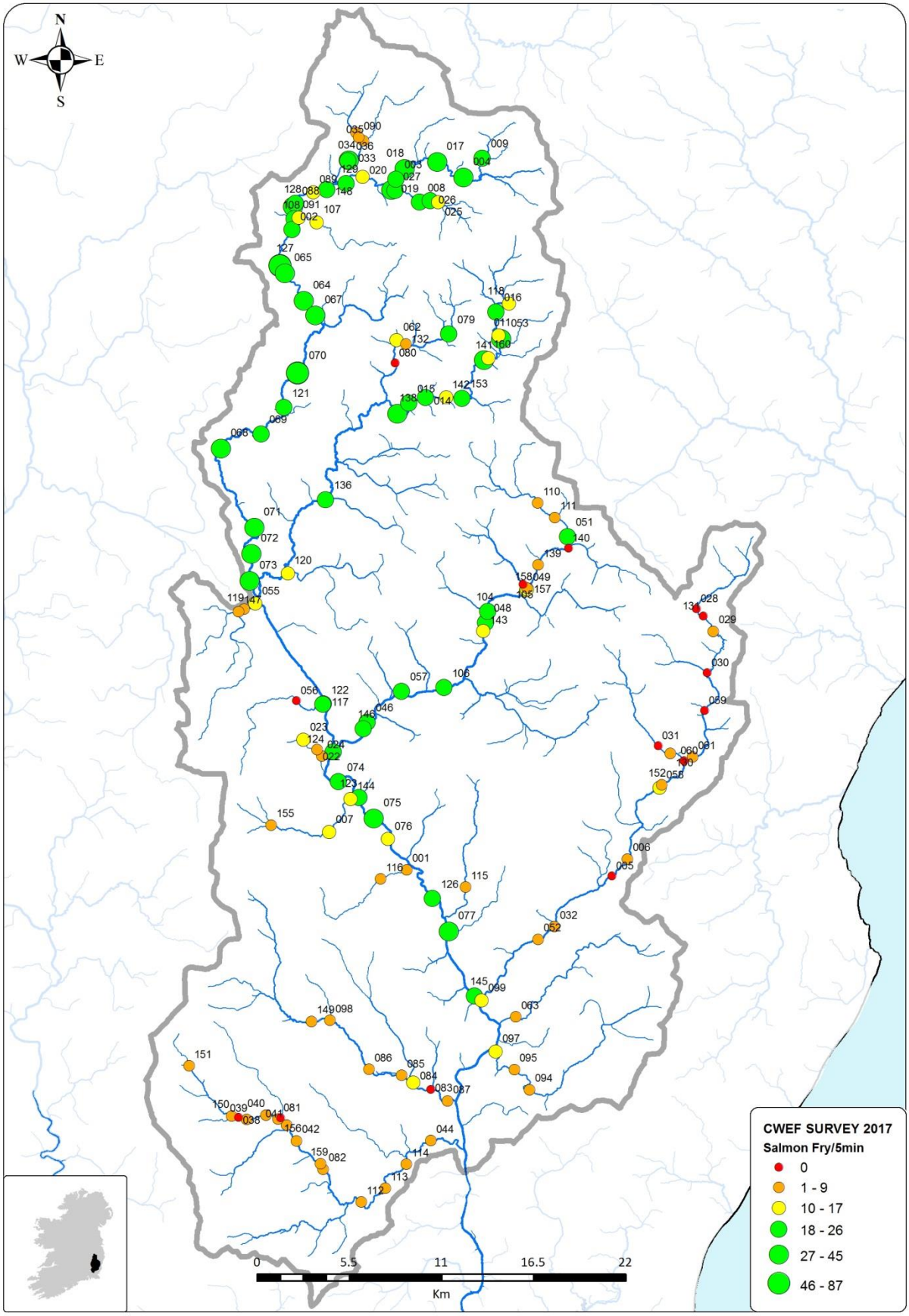
Table A.3.1.2: Site specific results of CWEF on the Slaney catchment in 2017. (Cont.)

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
068	S 83204 77720	5	1	9	23	Include	10.41	26.59
069	S 85598 78597	5	1	0	18	Include	0.00	21.00
070	S 87771 82215	5	1	0	40	Include	0.00	53.00
071	S 85187 73011	5	1	5	35	Include	5.63	39.38
072	S 85006 71434	5	1	0	25	Include	0.00	28.00
073	S 84912 69835	5	1	0	40	Include	0.00	40.00
074	S 90221 57861	6	1	7	22	Include	7.97	25.03
075	S 92312 55672	6	1	10	25	Include	11.14	27.86
076	S 93165 54435	6	2	0	10	Include	0.00	15.00
077	S 96791 48944	6	2	9	26	Include	10.03	28.97
079	S 96799 84548	3	0	7	17	Include	7.58	18.42
080	S 93588 82810	4	1	0	0	Include	0.00	0.00
081	S 86598 37735	3	1	2	1	Include	3.33	1.67
082	S 89283 34754	4	1	5	5	Include	6.50	6.50
083	S 95723 39513	4	1	0	0	Include	0.00	0.00
084	S 94661 39925	4	2	3	8	Include	3.82	10.18
085	S 93979 40349	4	1	0	4	Include	0.00	5.00
086	S 92038 40710	4	1	0	6	Include	0.00	8.00
087	S 96709 38823	4	1	0	5	Include	0.00	7.00
088	S 87500 92138	4	1	10	23	Include	11.52	26.48
089	S 88687 92985	4	1	2	13	Include	2.40	15.60
090	S 91400 96244	3	1	10	3	Include	11.54	3.46
091	S 87578 91406	4	1	1	16	Include	1.41	22.59
094	T 01614 39499	3	2	6	2	Include	6.75	2.25
095	T 00694 40695	3	2	4	3	Include	4.57	3.43
097	S 99588 41779	3	1	4	12	Include	5.25	15.75
098	S 89704 43626	4	1	3	4	Include	3.43	4.57
099	S 98729 44805	4	1	4	8	Include	4.67	9.33
104	S 99108 68019	5	1	9	18	Include	10.33	20.67
105	T 01229 69624	4	1	35	0	Include	42.00	0.00
106	S 96508 63471	5	1	7	19	Include	8.08	21.92
107	S 88910 91195	2	1	7	13	Include	7.70	14.30
108	S 87818 91463	2	1	7	13	Include	7.00	13.00
110	T 02079 74451	3	2	4	2	Include	4.67	2.33
111	T 03110 73597	3	2	4	3	Include	4.57	3.43
112	S 91565 32797	4	2	4	3	Include	5.14	3.86
113	S 93007 33617	4	1	3	5	Include	3.38	5.63
114	S 94245 35057	4	1	3	1	Include	3.75	1.25
115	S 97784 51563	3	1	4	3	Include	4.57	3.43
116	S 92712 52052	2	1	4	5	Include	4.89	6.11
117	S 89300 62514	6	2	6	19	Include	6.48	20.52
118	T 00363 86335	2	2	2	10	Include	2.67	13.33
119	S 84581 68128	4	1	3	6	Include	3.67	7.33
120	S 87174 70277	3	2	2	10	Include	2.50	12.50
121	S 86949 80163	5	1	10	23	Include	11.21	25.79
122	S 89276 62469	6	2	9	17	Include	10.38	19.62
123	S 91431 56920	6	1	8	24	Include	8.50	25.50
124	S 89892 59633	6	1	8	21	Include	8.00	21.00
126	S 95826 50898	6	1	12	24	Include	12.67	25.33
127	S 86724 88621	4	1	0	42	Include	0.00	52.00
128	S 87659 92334	4	1	1	18	Include	1.42	25.58
129	S 90678 93521	4	2	0	18	Include	0.00	20.00
130	T 10010 59548	3	1	4	3	Include	4.57	3.43
131	T 11969 67721	3	1	5	0	Include	7.00	0.00
132	S 94227 83939	4	1	7	1	Include	7.00	1.00
136	S 89448 74669	5	1	0	17	Include	0.00	18.00
138	S 93718 79786	4	1	5	24	Include	5.86	28.14
139	T 02126 70776	4	1	12	6	Include	14.67	7.33
140	T 03919 71775	4	1	5	0	Include	7.00	0.00
141	S 99147 83095	4	1	0	13	Include	0.00	17.00
142	S 96629 80759	4	2	4	8	Include	4.67	9.33
143	S 98836 66846	5	1	8	13	Include	9.14	14.86
144	S 90936 56835	3	1	0	13	Include	0.00	17.00
145	S 98335 45102	6	1	11	23	Include	12.29	25.71
146	S 91688 61034	5	1	3	18	Include	3.29	19.71
147	S 84244 67997	4	2	5	5	Include	6.00	6.00
148	S 89510 93156	4	2	2	15	Include	2.35	17.65

Table A.3.1.2: Site specific results of CWEF on the Slaney catchment in 2017. (Cont.)

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
149	S 88605 43569	4	0	1	5	Include	1.00	5.00
150	S 83821 37933	3	1			Duplicate Survey		
150	S 83821 37933	3	1	1	6	Include	1.29	7.71
151	S 81288 40922	3	1	3	6	Include	3.67	7.33
152	T 09477 57670	4	2	1	6	Include	1.43	8.57
153	S 97574 80717	4	2	0	20	Include	0.00	23.00
155	S 86200 55263	3	1	0	6	Include	0.00	6.00
156	S 86760 37814	2	1	18	0	Include	28.00	0.00
157	T 01452 69323	5	1	12	10	Include	13.64	11.36
158	T 01446 69387	4	1	8	3	Include	8.00	3.00
159	S 89140 35086	4	1	4	2	Include	5.33	2.67
160	S 98882 82978	4	1	0	26	Include	0.00	29.00
161	??	0	1	7	14	Include	7.33	14.67

Map A.3.1.1: Showing locations of 2017 survey sites on the Slaney



A.3.2. River Corock

IFI Salmon Catchment #: 33
2017 survey dates: 4/9/17 to 26/9/17
Mean Salmon Fry/5 min (2017): 1.23 fry/5min.
CWEF Index: 14.6 fry/5min.

Sampling carried out by:
Noel Power
Tony Byrne

Fish Species Present:
Brown Trout
European Eel
Flounder
Minnow
Sea Trout

Figure A.3.2.1: Length distribution of salmon captured in 2017 CWEF survey on the Corock Catchment.

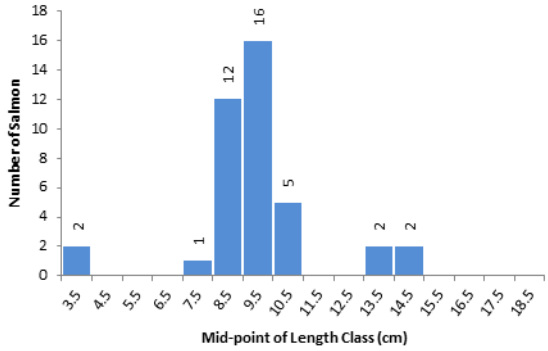


Figure A.3.2.2: Comparison of mean salmon fry/5min for all surveys on the Corock catchment to 2017.

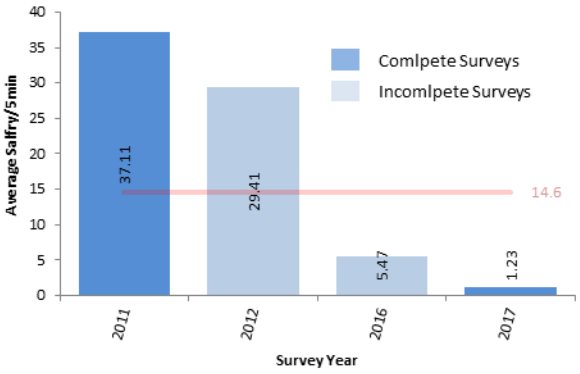


Table A.3.2.1: Conservation limits and provisional returns on the Corock catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	733	-417	Closed							
2008	2009	733	-417	Closed							
2009	2010	733	-407	Closed				3		31.53	
2010	2011	733	-407	Closed	4	2				15.76	37.11
2011	2012	733	-407	Closed				4		23.65	29.41*
2012	2013	733	-407	Catch Release							
2013	2014	836	-589	Catch Release							
2014	2015	835	-590	Catch Release							
2015	2016	835	-590	Catch Release	5					18.92	5.47
2016	2017	835	-590	Catch Release	6					15.76	1.23

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; * = Incomplete Surveys.

This, the third complete CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 6 sites, all of which were included in the analysis. Salmon fry were present at just 3 sites. The maximum fry catch was 3 salmon at sites two and eight. The mean catch of included sites was 1.23 salmon fry/5min.

Conclusion

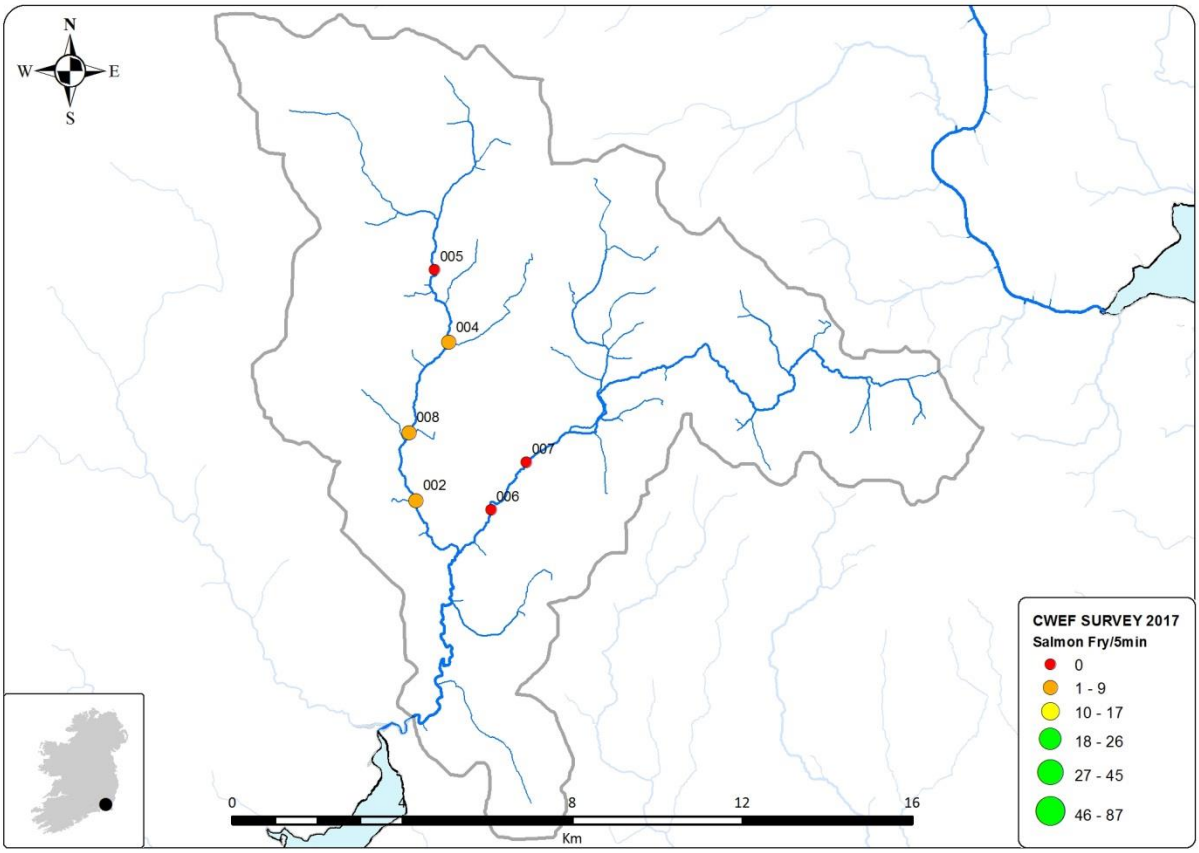
The Corock had a mean catch of 1.23 salmon fry/5min in 2017. Taking the five most recent surveys into account this results in a cumulative average of 14.6 salmon fry/5min. This is below the 17 salmon

fry threshold. There has been a reduction in the numbers of fry caught at each survey since 2009. The fry numbers this year are considerably lower than those caught in the first year of the survey.

Table A.3.2.2: Site specific results of CWEF on the Corock catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
002	S 85388 18672	4	1	3	2	Include	3.60	2.40
004	S 86163 22397	2	1	0	4	Include	0.00	4.00
005	S 85834 24106	4	2	1	0	Include	1.00	0.00
006	S 87155 18458	4	1	0	0	Include	0.00	0.00
007	S 87987 19576	4	1	0	0	Include	0.00	0.00

Map A.3.2.1: Showing the locations and results of 2017 CWEF surveys on the Corock River.



A.3.3. River Owenduff

IFI Salmon Catchment #: 34
2017 survey dates: 4- 26/9/17
Mean Salmon Fry/5 min (2017): 0.40 fry/5min.
CWEF Index: 7.08 fry/5min.

Sampling carried out by:
Noel Power
Tony Byrne

Fish Species Present:
Salmon
Brown Trout
Three-Spined Stickleback

Figure A.3.3.1: Length distribution of salmon captured in 2017 CWEF survey on the Owenduff Catchment.

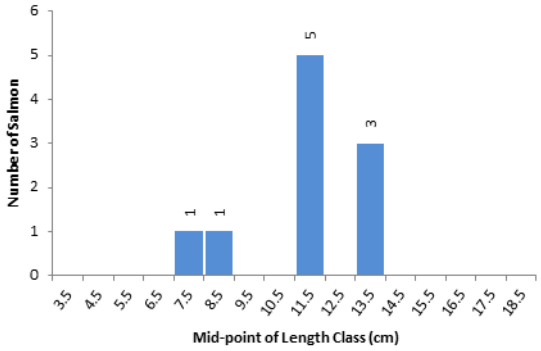


Figure A.3.3.2: Comparison of mean salmon fry/5min for all surveys on the Owenduff catchment to 2017.

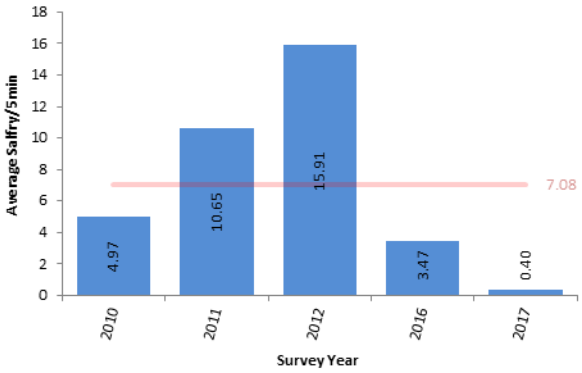


Table A.3.3.1: Conservation limits and provisional returns on the Owenduff catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Included Sites	Threshold Below Efficiency	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	201	-112	Closed							
2008	2009	201	-113	Closed							
2009	2010	201	-110	Closed	3					10.90	4.97
2010	2011	201	-110	Closed	6					5.45	10.65
2011	2012	201	-110	Closed	6					5.45	15.91
2012	2013	201	-110	Closed							
2013	2014	300	-218	Closed							
2014	2015	299	-217	Closed							
2015	2016	299	-217	Closed	5					6.54	3.47
2016	2017	299	-217	Closed	5					6.54	0.40

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; * = Incomplete Surveys.

This, the fifth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during September 2017. The survey comprised five sites, all of which were included in the analysis. Salmon fry were present at just two 2 sites, one fry at each. The mean catch of included sites was 0.4 salmon fry/5min, the lowest result from any of the CWEF surveys carried out to date.

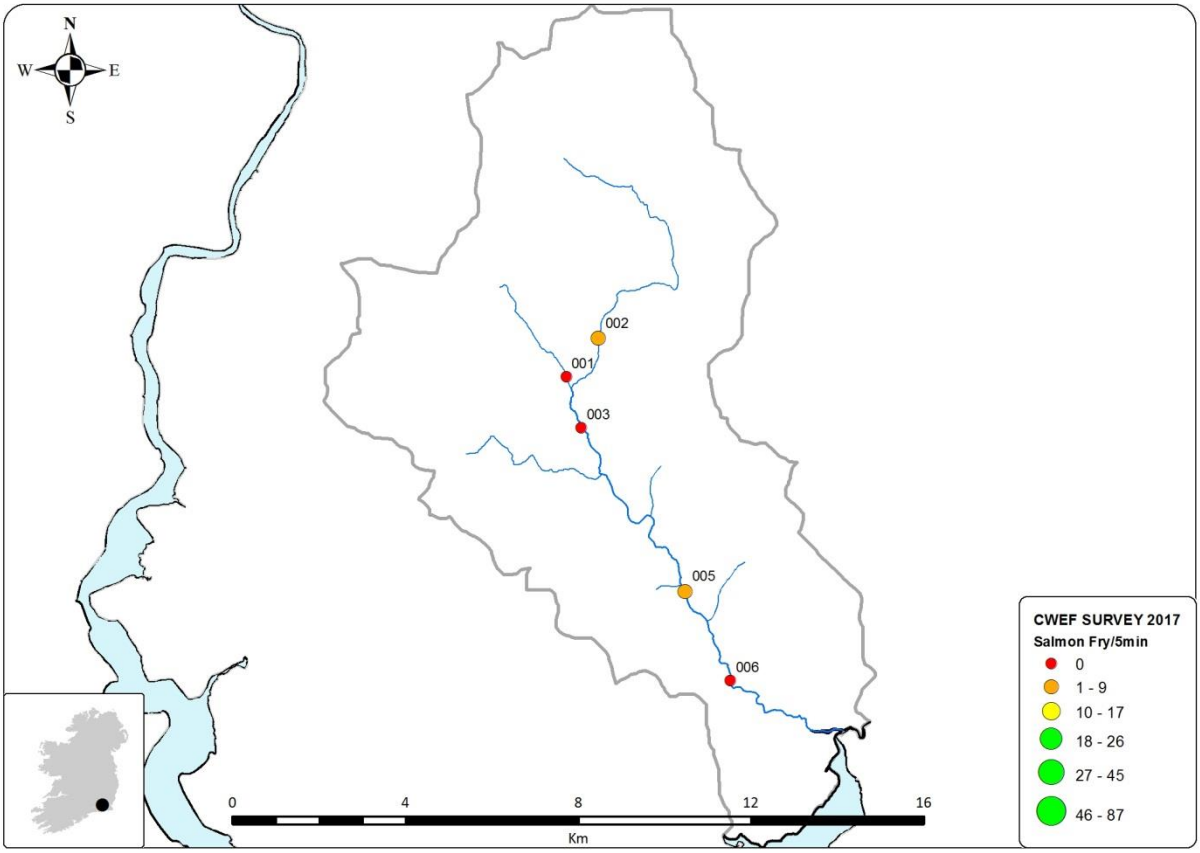
Table A.3.3.2: Site specific results of CWEF on the Owenduff catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	S 78254 21574	2	3	0	0	Include	0.00	0.00
002	S 78991 22464	2	2	0	1	Include	0.00	1.00
003	S 78597 20394	3	2	0	0	Include	0.00	0.00
005	S 81008 16602	3	2	0	1	Include	0.00	1.00
006	S 82060 14540	3	1	0	0	Include	0.00	0.00

Conclusion

The Owenduff had a mean catch of 0.4 salmon fry/5min in 2017. Taking the five most recent surveys into account this results in a cumulative average of 7.08 salmon fry/5min which is below the 17 salmon fry threshold. There has been a reduction in the numbers of fry caught at each survey since 2012. The fry numbers this year are considerably lower than those caught in 2011 and 2012.

Map A.3.3.1: Showing locations of 2017 survey sites on the Owenduff.



A.3.4. River Barrow

IFI Salmon Catchment #: 37
2017 survey dates: 19/8/17 to 25/9/17
Mean Salmon Fry/5 min (2017): 11.54 fry/5min.
CWEF Index: 15.83 fry/5min.

Sampling carried out by:
Noel Power
Tony Byrne

Fish Species Present:

Brown Trout	Minnow
Salmon	Pike
Dace	Roach
European Eel	Stone Loach
Gudgeon	3-Spined Stickleback

Figure A.3.4.1: Length distribution of salmon captured in 2017 CWEF survey on the Barrow Catchment.

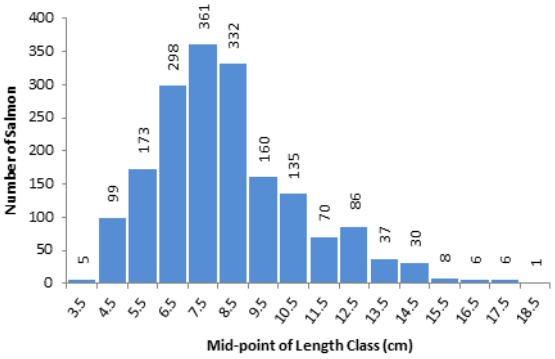


Figure A.3.4.2: Comparison of mean salmon fry/5min for all surveys on the Barrow catchment to 2017.

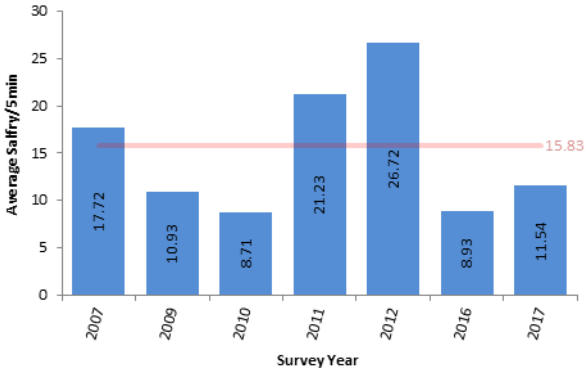


Table A.3.4.1: Conservation limits and provisional returns on the Barrow catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	12025	-8859	Closed							
2008	2009	12025	-7004	Closed	66	12		6		13.04	10.93
2009	2010	12117	-7292	Closed	76	1	1	5		10.19	8.71
2010	2011	12116	-7344	Closed	58	22		4		13.04	21.23
2011	2012	12116	-7324	Closed	70	12		23		10.43	26.72
2012	2013	12116	-7135	Closed							
2013	2014	11736	-8299	Closed							
2014	2015	11737	-8299	Catch Release							
2015	2016	11737	-9720	Catch Release							
2016	2017	11737	-9594	Catch Release	109	4		16		8.49	11.54

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the sixth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during August and September 2017. The survey comprised 129 sites, 109 of which were included in the analysis. Salmon fry were present at 78 sites. The maximum fry catch was 52 salmon at site 123. The mean catch of included sites was 11.54 salmon fry/5min. The modal length category of 0+ fry caught was 7.5cm. A number of large, probably 2+ parr were caught the longest of these was over 18cm.

Conclusion

The Barrow had a mean catch of 11.54 salmon fry/5min in 2017. Taking the five most recent surveys into account this results in a cumulative average of 15.83 salmon fry/5min which is below the 17 salmon fry threshold.

Table A.3.4.2: Site specific results of CWEF on the Barrow catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
004	N 38563 14734	3	1	4	29	Include	5.09	36.91
006	N 36634 13219	3	1	2	23	Include	2.80	32.20
007	N 36087 13008	3	0	5	32	Include	6.49	41.51
008	N 34729 11076	3	2	11	25	Include	17.11	38.89
009	N 35145 10515	3	1	28	20	Include	45.50	32.50
014	S 70903 43584	3	2	0	0	Include	0.00	0.00
016	S 68469 44428	3	1	0	9	Include	0.00	12.00
021	S 74956 55815	4	2	0	0	Include	0.00	0.00
022	S 74425 50995	4	1	1	24	Include	1.12	26.88
023	S 78267 50994	3	2	9	24	Include	9.82	26.18
025	S 79039 51107	3	2	0	15	Include	0.00	15.00
026	S 81828 48116	2	2	0	0	Include	0.00	0.00
028	S 68207 53890	3	2	0	0	Include	0.00	0.00
029	S 67426 55401	3	1	0	20	Include	0.00	21.00
030	S 66591 56479	3	1	0	23	Include	0.00	25.00
031	S 65303 57010	3	1	3	6	Include	3.00	6.00
034	S 77954 60136	2	1	0	39	Include	0.00	42.00
035	S 78117 59568	2	2	0	47	Include	0.00	50.00
036	S 78723 58852	2	1	0	2	Include	0.00	2.00
040	S 69303 77259	4	1	0	13	Include	0.00	15.00
041	S 68860 78397	4	5	0	4	Include	0.00	5.00
043	S 67299 80183	4	2	3	18	Include	3.29	19.71
045	S 72634 82167	4	1	13	42	Include	13.71	44.29
046	S 74222 81486	4	2	3	3	Include	4.00	4.00
047	S 75938 83182	4	1	1	2	Include	1.67	3.33
048	S 71075 82306	4	1	0	6	Include	0.00	8.00
049	S 69679 83295	4	0	0	2	Include	0.00	2.00
050	S 68889 83898	4	2	0	7	Include	0.00	7.00
051	S 65870 85987	4	2	0	21	Include	0.00	23.00
052	S 64945 85654	3	1	0	3	Include	0.00	4.00
053	S 64140 85582	3	2	0	1	Include	0.00	1.00
054	S 72922 84947	4	1	10	39	Include	10.61	41.39
055	S 77497 90557	4	1	2	6	Include	2.25	6.75
056	S 80129 97234	2	1	3	5	Include	3.38	5.63
057	S 79927 93234	4	1	4	7	Include	4.73	8.27
058	S 60265 98244	4	1	7	28	Include	7.40	29.60
061	N 67930 03365	3	2	2	12	Include	2.00	12.00
062	N 69829 03081	3	2	0	10	Include	0.00	12.00
063	N 72264 02621	3	2	0	0	Include	0.00	0.00
065	N 68105 04107	2	1	1	0	Include	1.00	0.00
071	N 66633 19136	3	2	0	11	Include	0.00	14.00
072	N 67556 19537	3	2	0	6	Include	0.00	8.00
079	N 53130 16742	3	3	2	0	Include	3.00	0.00
080	N 47835 05737	3	3	0	0	Include	0.00	0.00
081	N 46374 00613	3	2	0	0	Include	0.00	0.00
084	N 45517 07381	4	0	2	15	Include	2.47	18.53
085	N 44930 07316	4	2	2	13	Include	2.40	15.60
086	N 44132 06559	4	1	2	22	Include	2.33	25.67
088	N 41856 05260	4	1	0	23	Include	0.00	30.00
089	N 41693 05144	4	1	6	26	Include	7.31	31.69
091	N 34114 10386	2	1	16	15	Include	19.61	18.39
092	S 76956 51611	4	2	16	17	Include	17.45	18.55
097	N 72561 03269	3	2	0	0	Include	0.00	0.00
099	S 73482 87614	4	1	0	45	Include	0.00	47.00
102	?	0	2	0	0	Include	0.00	0.00
105	N 42870 05486	4	1	2	24	Include	2.31	27.69

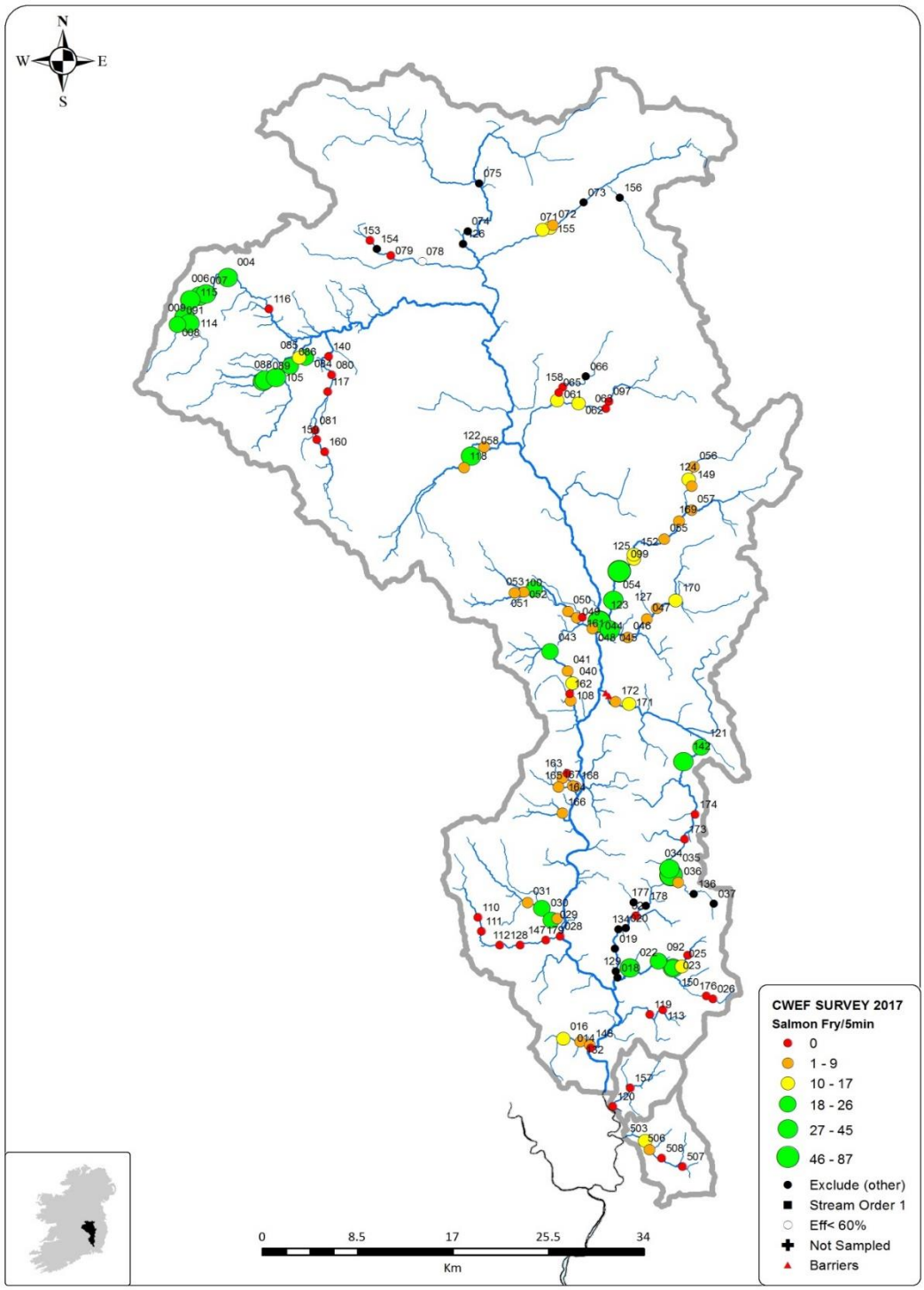
Table A.3.4.2: Site specific results of CWEF on the Barrow catchment in 2017. (Cont.)

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
108	S 69151 75634	4	2	0	3	Include	0.00	3.00
110	S 60871 55626	3	2	0	0	Include	0.00	0.00
111	S 61187 54352	3	0	0	0	Include	0.00	0.00
112	S 62831 53091	3	1	0	0	Include	0.00	0.00
113	S 77358 47110	3	2	0	0	Include	0.00	0.00
115	N 35239 12688	3	1	8	23	Include	10.84	31.16
116	N 42255 11813	4	2	0	0	Include	0.00	0.00
117	N 47472 04167	3	2	0	0	Include	0.00	0.00
118	S 59623 97162	4	2	4	4	Include	4.00	4.00
119	S 76200 46697	3	2	0	0	Include	0.00	0.00
120	S 72890 38171	3	2	2	0	Include	2.00	0.00
121	S 80780 71348	4	1	1	25	Include	1.00	25.00
122	S 61409 99067	4	1	0	6	Include	0.00	8.00
123	S 71685 82946	4	2	7	52	Include	7.47	55.53
124	S 79647 96064	2	1	2	10	Include	2.50	12.50
125	S 74771 88757	4	1	2	15	Include	2.24	16.76
127	S 76823 84175	4	1	0	8	Include	0.00	8.00
128	S 64620 53080	3	1	0	0	Include	0.00	0.00
132	S 69984 44152	3	1	2	3	Include	2.00	3.00
140	N 47581 07434	4	2	0	0	Include	0.00	0.00
142	S 79182 70027	4	1	4	36	Include	4.30	38.70
147	S 66923 53551	3	2	0	0	Include	0.00	0.00
148	S 70841 43847	3	2	0	1	Include	0.00	1.00
149	S 79917 95454	2	2	2	6	Include	2.50	7.50
150	S 78267 50989	3	2	1	20	Include	1.19	23.81
152	S 74781 89143	4	1	3	8	Include	3.55	9.45
153	N 51255 18138	3	3	0	0	Include	0.00	0.00
155	N 67327 19322	3	2	0	13	Include	0.00	15.00
157	S 74459 39875	3	2	0	0	Include	0.00	0.00
158	N 68431 04623	2	2	0	0	Include	0.00	0.00
159	S 46517 99760	3	3	0	0	Include	0.00	0.00
160	S 47205 98622	3	3	0	0	Include	0.00	0.00
161	S 70174 83354	2	2	0	0	Include	0.00	0.00
162	S 69061 76274	4	2	0	0	Include	0.00	0.00
163	S 68831 68953	2	2	0	0	Include	0.00	0.00
164	S 68400 68486	2	2	0	3	Include	0.00	4.00
165	S 68062 67673	3	1	1	1	Include	1.50	1.50
166	S 68409 65257	3	1	2	4	Include	2.33	4.67
167	S 69322 67782	4	1	0	2	Include	0.00	2.00
168	S 69559 67693	4	1	0	3	Include	0.00	3.00
169	S 78800 92245	4	1	2	4	Include	2.67	5.33
170	S 78493 84907	4	2	6	16	Include	6.00	16.00
171	S 74341 75343	4	2	6	8	Include	6.86	9.14
172	S 73127 75530	4	2	0	4	Include	0.00	6.00
173	S 79286 62872	4	3	0	0	Include	0.00	0.00
174	S 80223 65163	4	2	0	0	Include	0.00	0.00
175	S 79572 52145	3	2	0	0	Include	0.00	0.00
176	S 81245 48399	2	2	0	0	Include	0.00	0.00
179	S 67931 55534	3	1	0	9	Include	0.00	9.00
503	S 75771 34996	3	1	0	13	Include	0.00	14.00
506	S 76166 34196	3	2	0	6	Include	0.00	6.00
507	S 79109 32621	3	2	0	0	Include	0.00	0.00
508	S 77258 33428	3	1	0	0	Include	0.00	0.00
044	S 71850 81637	4	1			Eff <60%		
078	N 55900 16196	3	2			Eff <60%		
100	S 64646 85618	3	1			Eff <60%		
114	N 35736 09566	2	1			Eff <60%		
066	N 70514 05613	2	0			Unsuitable Habitat		
074	N 59963 19019	4	3			Unsuitable Habitat		
075	N 61003 23435	4	3			Unsuitable Habitat		
126	N 59544 17853	4	3			Unsuitable Habitat		
154	N 51858 17372	3	3			Unsuitable Habitat		
019	S 73111 52752	4	3			Unsuitable		
020	S 74070 54665	4	2			Unsuitable		
129	S 73192 50683	4	3			Unsuitable		
134	S 73406 54560	4	2			Unsuitable		
177	S 74745 57044	2	3			Unsuitable		

Table A.3.4.2: Site specific results of CWEF on the Barrow catchment in 2017. (Cont.)

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
178	S 75841 56727	3	3			Unsuitable		
073	N 70315 21660	3	3			Too Deep		
156	N 73534 22106	2	0			Too Deep		
136	S 80129 57829	2	2			Barrier?		
037	S 81917 56907	2	2			Barrier Ds		
018	S 73310 50094	4	2			Exclude/Discontinue		

Map A.3.4.1: Showing the locations and results of 2017 CWEF surveys on the Barrow River.



A.4.South Western River Basin District.

Summary

Since 2007, forty-one salmon 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). At present twelve rivers are meeting the threshold of 17 salmon fry per 5min. In this region in 2017 seven CWEF surveys were undertaken; a sub catchment survey was also undertaken on the Brown Flesk tributary of the Maine.

Table A.4.1: Catchment-wide Electrofishing data for the South Western River Basin District 2007-2017 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

	Survey Year											Current	# Annual Surveys
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Index	Considered
055/Lickey		**12.37**							**14.14**			13.26	2
059/Blackwater (Munster)	**22.72**	**10.67**								**13.56**		15.65	3
060/Bride		**10.40**		**24.70**				**19.85**			**7.65**	15.65	4
061/Tourig						**9.40**						9.40	1
062/Womanagh		**15.45**						**2.39**			**1.43**	6.42	3
064/Owennacurra	**15.76**											15.76	1
066/Lower Lee			**0.26**									0.26	1
069/Bandon										**11.01**		11.01	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**			2.46	2
084/Croanshagh										**23.38**		23.38	1
085/Owenshagh							**4.32**		**6.73**			5.53	2
086/Cloonee						**16.18**	**33.06**				**24.09**	24.44	3
088/Roughty					**19.78**							19.78	1
089/Finnihy						**8.61**	**0.00**				**0.58**	3.06	3
090/Blackwater (Kerry)	**30.54**	**15.52**	**13.35**					**18.01**				19.36	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**									22.21	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**							**10.74**			**6.88**	12.35	3
103/Behy	**15.41**	**6.14**	**4.03**	**8.71**	**7.17**					**2.89**		5.79	5
106/Laune	17.42*										**21.41**	21.41	1
107/Maine	**31.88**	**32.81**	**34.23**								22.0*	32.97	3
108/Emlagh	**10.37**	**3.66**	**13.38**	**3.84**	**2.59**					**2.10**		5.11	5
109/Owenascaul	**20.41**		**22.27**				**16.08**	**16.28**				18.76	4
110/Owenalondrig			**21.90**									21.90	1
111/Milltown		**15.33**		**26.44**			**13.02**		**8.76**			15.89	4
112/Feohanagh			**16.61**				**3.20**	**11.93**				10.58	3
114/Owenmore	**25.07**											25.07	1
115/Scorid										**1.86**		1.86	1
115/Glenahoo										**1.87**		1.87	1
116/Aghacashla										**4.89**		4.89	1
116/Owenamallagh										**0.00**		0.00	1
116/Meennascarty										**0.00**		0.00	1
117/Lee (Kerry)		**0.67**						**0.68**			0.69†	0.68	2

Bold annual figures indicate years included in calculation of current CWEF index.
Underlined index figures indicate those exceeding the 17 salmon fry threshold.
† Incomplete surveys not included in calculation of current index.
* Sub-catchment surveys not included in calculation of current index

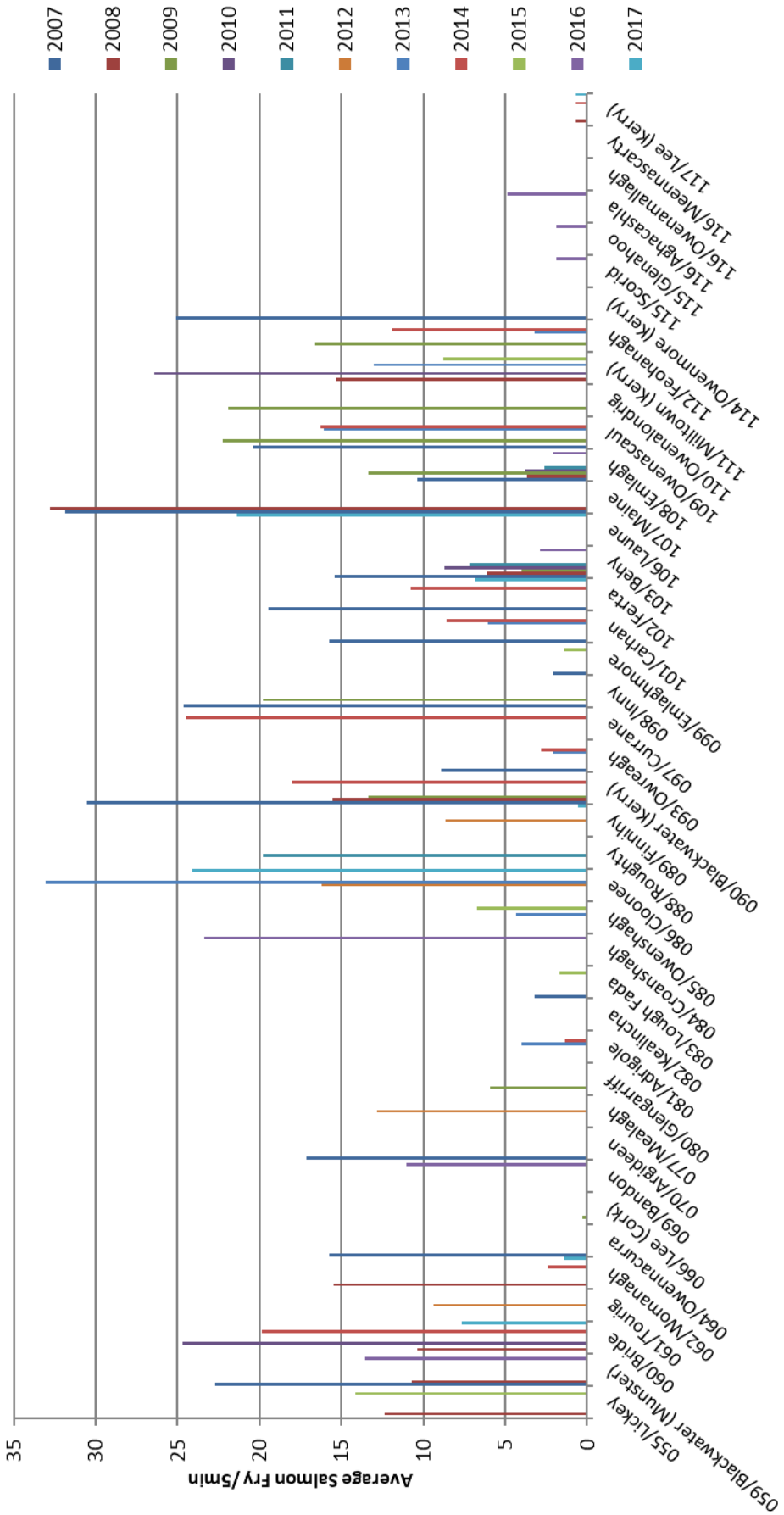


Figure A.4.1: Summary of CWEF results in South Western River basin district 2007-2017.

A.4.1. River Bride

IFI Salmon Catchment #: 60
2017 survey dates: 26/8/17 to 13/9/2017
Mean Salmon Fry/5 min (2017): 7.65 fry/5min.
CWEF Index: 15.65 fry/5min.

Sampling carried out by:
Andrew Gillespie
Catherine Dwane
Mark Fanning
Stephen McKenna
Tony Holmes

Fish Species Present:
Brown Trout
European Eel
Flounder
Gudgeon
Salmon
3-Spined Stickleback

Figure A.4.1.1: Length distribution of salmon captured in 2017 CWEF survey on the Bride Catchment.

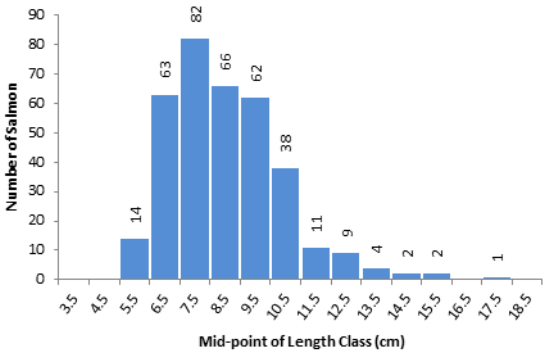


Figure A.4.1.2: Comparison of mean salmon fry/5min for all surveys on the Bride catchment to 2017.

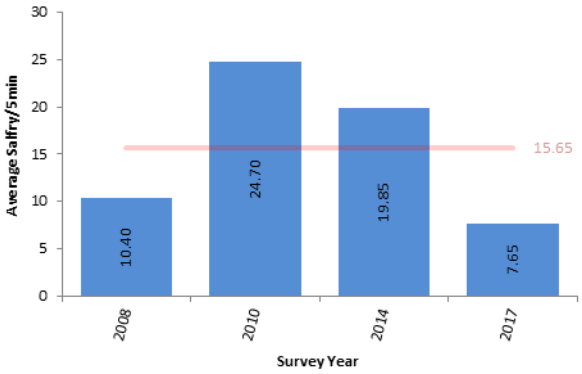


Table A.4.1.1: Conservation limits and provisional returns on the Bride catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	1379	-992	Catch Release	19	2				7.65	10.40
2008	2009	1379	-940	Catch Release							
2009	2010	1379	-1029	Catch Release	25		1			6.18	24.70
2010	2011	1379	-1039	Catch Release							
2011	2012	1379	-1039	Catch Release							
2012	2013	1379	-1038	Catch Release							
2013	2014	1569	-641	Catch Release	33	2	1	1		4.34	19.85
2014	2015	1567	-634	Catch Release							
2015	2016	1567	-43	Catch Release							
2016	2017	1567	-287	Catch Release	35			3		4.12	7.65

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the fourth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during August and September 2017. The survey comprised 38 sites, 35 of which were included in the analysis. Salmon fry were present at 29 sites. The maximum fry catch was 25 salmon at sites 5 and 6 on the mid

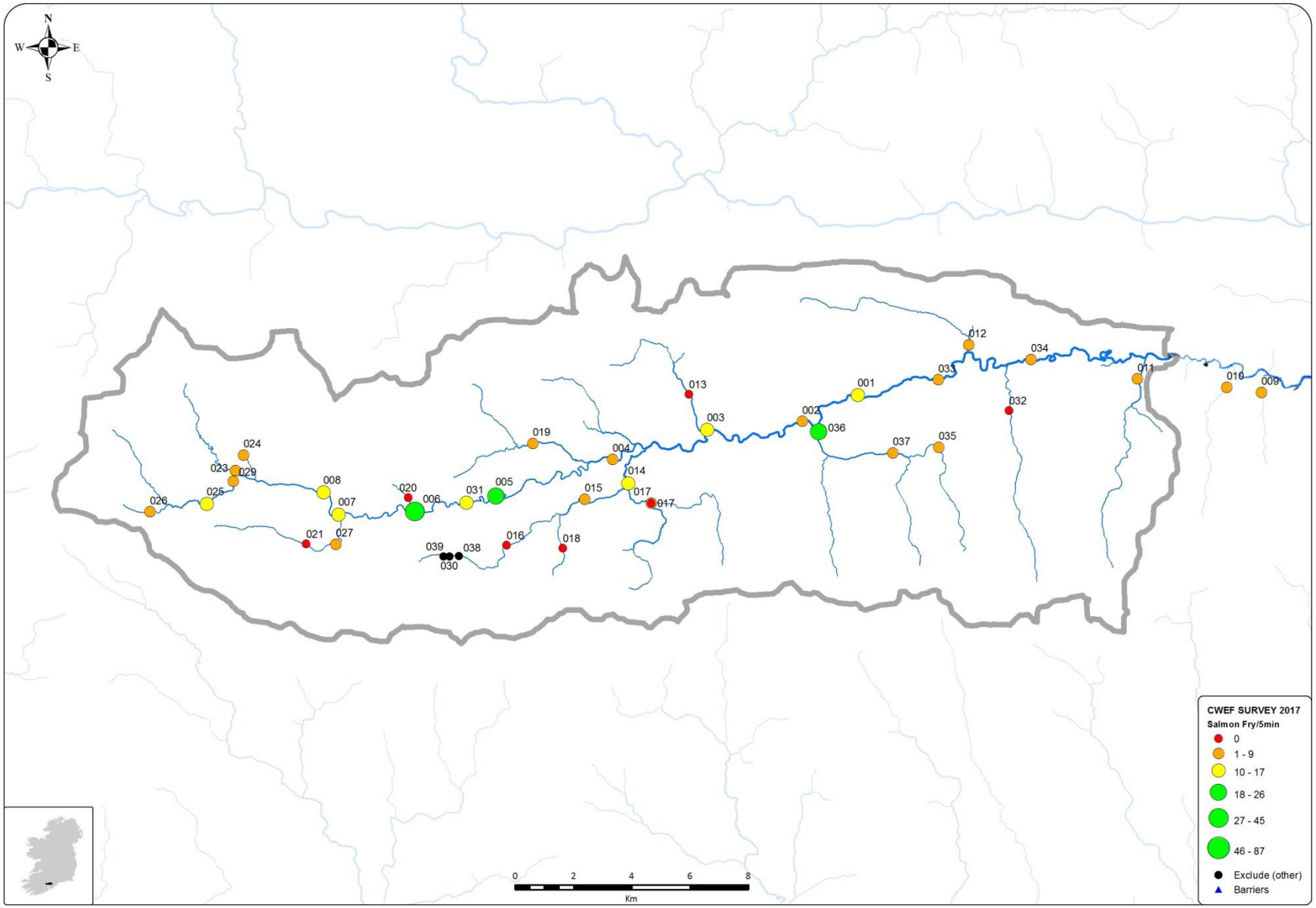
to upper stretches of the main channel. The mean catch of included sites was 7.65 salmon fry/5min. The modal length category of 0+ fry caught was 7.5cm.

Conclusion

The Bride had a mean catch of 7.65 salmon fry/5min in 2017. Taking the five most recent surveys into account this results in a cumulative average of 15.65 salmon fry/5min which is below the 17 salmon fry threshold. There has been a reduction in the average numbers of fry caught at each survey since 2010.

Table A.4.1.1: Site specific results of CWEF on the Bride catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	W 89732 92892	5	3	0	6	Include	0.00	10.00
002	W 87832 91990	5	1	3	6	Include	4.33	8.67
003	W 84550 91686	5	3	2	10	Include	2.67	13.33
004	W 81312 90665	4	1	3	4	Include	3.00	4.00
005	W 77292 89403	3	1	0	25	Include	0.00	25.00
006	W 74526 88866	3	1	1	25	Include	1.12	27.88
007	W 71909 88741	3	1	13	12	Include	15.08	13.92
008	W 71389 89498	3	1	1	8	Include	1.44	11.56
009	X 03591 93032	2	1	2	6	Include	2.50	7.50
010	X 02400 93205	2	1	6	6	Include	7.50	7.50
011	W 99329 93479	3	1	1	4	Include	1.40	5.60
012	W 93542 94636	3	1	1	7	Include	1.25	8.75
013	W 83936 92915	3	2	2	0	Include	2.00	0.00
014	W 81850 89847	4	1	10	8	Include	11.67	9.33
015	W 80355 89295	3	1	9	4	Include	11.08	4.92
016	W 77684 87710	2	2	5	0	Include	7.00	0.00
017	W 82643 89165	3	2	7	0	Include	9.00	0.00
017	W 82643 89165	3	2	9	5	Include	11.57	6.43
018	W 79610 87603	2	0	13	0	Include	15.00	0.00
019	W 78574 91201	3	1	2	6	Include	2.75	8.25
020	W 74300 89333	2	2	9	0	Include	12.00	0.00
021	W 70800 87730	2	1	11	0	Include	11.00	0.00
023	W 68366 90240	2	2	6	5	Include	7.64	6.36
024	W 68640 90782	2	2	12	1	Include	15.69	1.31
025	W 67371 89091	3	1	1	14	Include	1.20	16.80
026	W 65436 88817	2	1	3	5	Include	3.75	6.25
027	W 71815 87727	2	1	7	3	Include	7.00	3.00
029	W 68296 89877	3	2	8	5	Include	9.23	5.77
031	W 76292 89169	3	0	0	12	Include	0.00	15.00
032	W 94927 92379	2	1	7	0	Include	9.00	0.00
033	W 92493 93432	5	1	0	5	Include	0.00	8.00
034	W 95681 94135	5	1	0	5	Include	0.00	8.00
035	W 92511 91107	2	1	3	3	Include	3.00	3.00
036	W 88367 91637	3	1	7	15	Include	8.27	17.73
037	W 90936 90911	3	1	9	4	Include	9.00	4.00
038	W 76047 87340	2	3			Recent Pollution		
030	W 75730 87326	2	2			Recent Pollution		
039	W 75523 87321	2	3			Recent Pollution		



Map A.4.1.1: Showing the locations and results of 2017 CWEF surveys on the Bride River.

A.4.2. River Womanagh

IFI Salmon Catchment #: 62
2017 survey dates: 13/9/2017 to 15/9/2017
Mean Salmon Fry/5 min (2017): 1.43 fry/5min.
CWEF Index: 6.42 fry/5min.

Sampling carried out by:
Catherine Dwane
D. A. O'Donovan
Stephen McKenna

Fish Species Present:

Brown Trout	Salmon
European Eel	Stone Loach
Flounder	3-Spined Stickleback

Figure A.4.2.1: Length distribution of salmon captured in 2017 CWEF survey on the Womanagh Catchment.

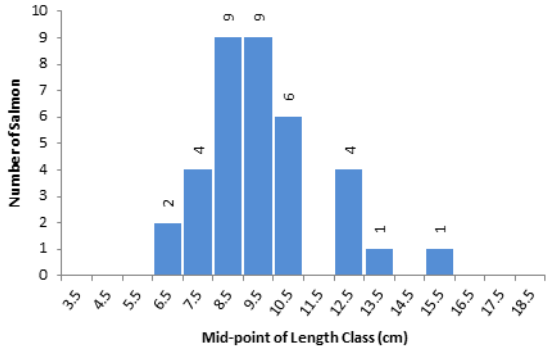


Figure A.4.2.2: Comparison of mean salmon fry/5min for all surveys on the Womanagh catchment to 2017.

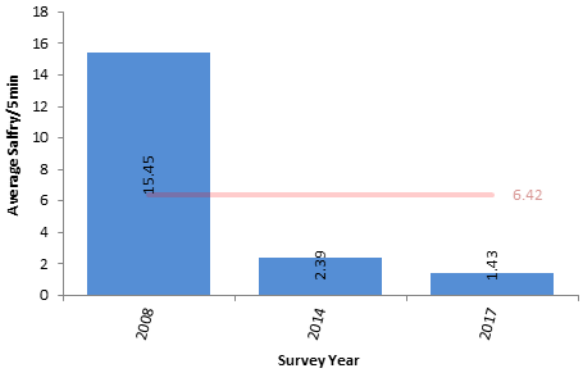


Table A.4.2.1: Conservation limits and provisional returns on the Womanagh catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	293	-172	Closed	8	3				4.80	15.45
2008	2009	293	-172	Closed							
2009	2010	293	-177	Closed							
2010	2011	293	-177	Closed							
2011	2012	293	-177	Closed							
2012	2013	293	-177	Closed							
2013	2014	366	-276	Closed	15					3.52	2.39
2014	2015	368	-278	Closed							
2015	2016	368	-278	Closed							
2016	2017	368	-278	Closed	13					4.06	1.43

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the third CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 13 sites, all of which were included in the analysis. Salmon fry were present at 6 sites. The maximum fry catch was 5 salmon at site 11. The mean catch of included sites was 1.43 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

Conclusion

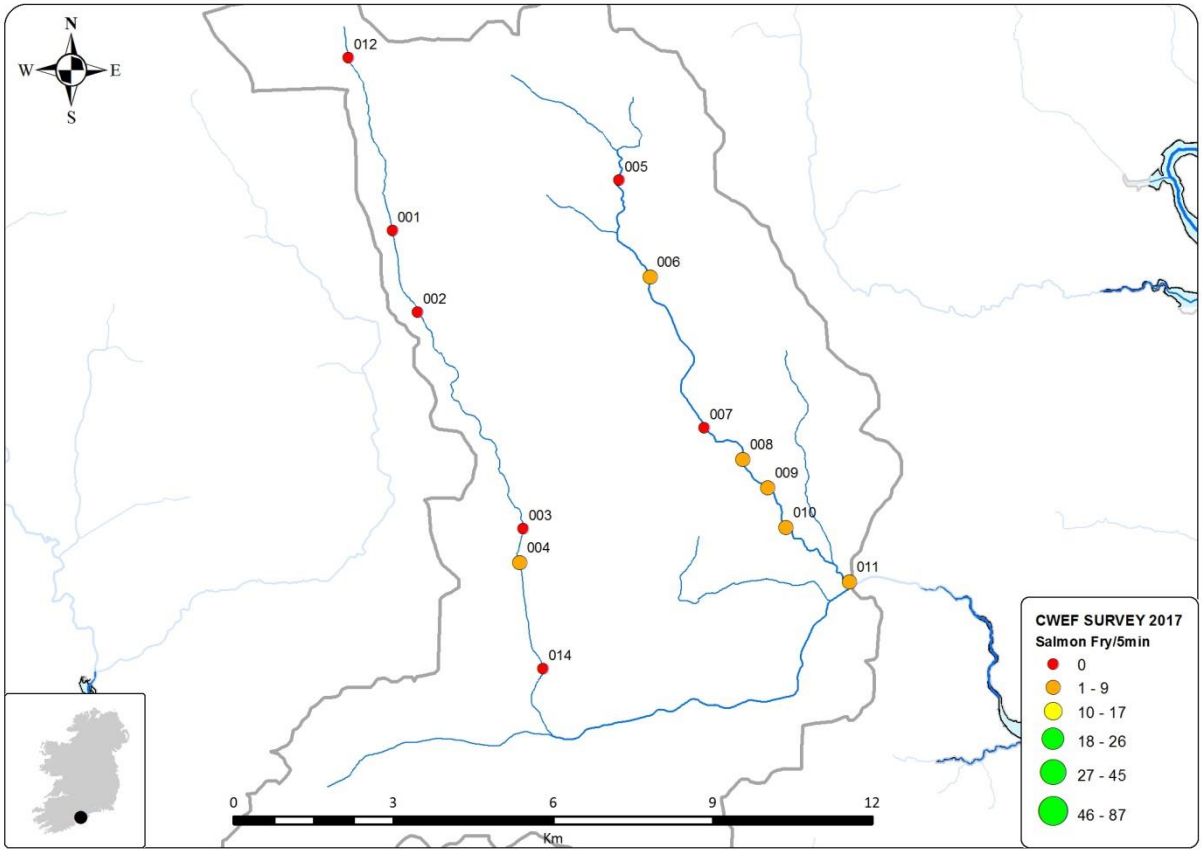
The Womanagh had a mean catch of 1.43 salmon fry/5min in 2017. Taking the three most recent surveys into account this results in a cumulative average of 6.42 salmon fry/5min which is below the

17 salmon fry threshold. There has been a reduction in the numbers of fry caught at each survey since 2008.

Table A.4.2.2: Site specific results of CWEF on the Womanagh catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	W 93539 81445	2	1	13	0	Include	16.00	0.00
002	W 94014 79902	2	1	11	0	Include	12.00	0.00
003	W 95999 75831	2	1	13	0	Include	14.00	0.00
004	W 95930 75197	2	1	11	2	Include	12.69	2.31
005	W 97795 82393	3	2	14	0	Include	16.00	0.00
006	W 98378 80570	3	2	2	3	Include	2.80	4.20
007	W 99394 77730	3	3	1	0	Include	2.00	0.00
008	X 00124 77135	3	1	6	1	Include	6.00	1.00
009	X 00592 76598	3	1	5	1	Include	5.83	1.17
010	X 00928 75856	3	1	5	3	Include	6.25	3.75
011	X 02124 74835	3	1	4	5	Include	4.89	6.11
012	W 92712 84692	2	1	6	0	Include	6.00	0.00
014	W 96371 73194	2	2	14	0	Include	14.00	0.00

Map A.4.2.1: Showing locations of 2016 survey sites on Womanagh.



A.4.3. River Cloonee

IFI Salmon Catchment #:	86
2017 survey dates:	21/9/2017
Mean Salmon Fry/5 min (2017):	24.09 fry/5min.
CWEF Index:	24.44 fry/5min.

Sampling carried out by:
Andrew Quigley
Sean Moran
Tony Holmes

Fish Species Present:
Brown Trout
European Eel
Minnow
Salmon

Figure A.4.3.1: Length distribution of salmon captured in 2017 CWEF survey on the Cloonee Catchment.

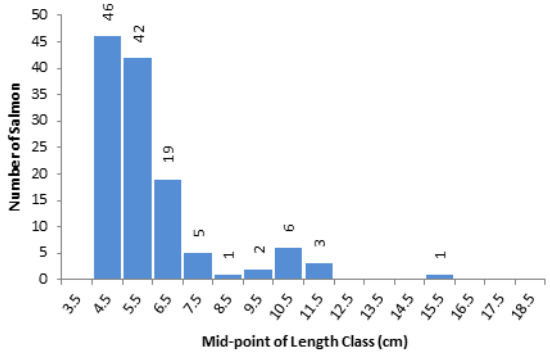


Figure A.4.3.2: Comparison of mean salmon fry/5min for all surveys on the Cloonee catchment to 2017.

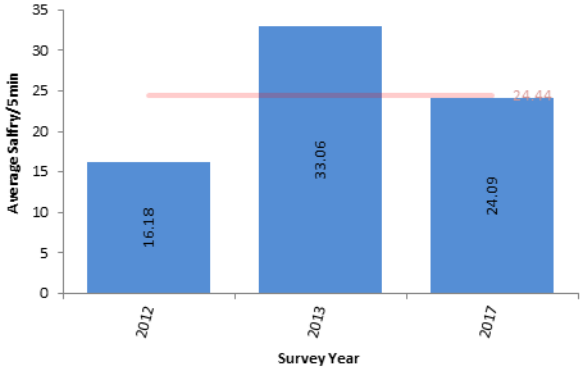


Table A.4.3.1: Conservation limits and provisional returns on the Cloonee catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	75	-30	Closed							
2008	2009	75	-30	Closed							
2009	2010	75	-30	Closed							
2010	2011	75	-30	Closed							
2011	2012	75	-30	Closed	6			1		2.22	16.18
2012	2013	75	-30	Closed	6					2.59	33.06
2013	2014	61	-28	Closed							
2014	2015	61	-29	Catch Release							
2015	2016	61	-28	Catch Release							
2016	2017	61	-36	Catch Release	6			1		2.22	24.09

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; * = Incomplete Surveys.

This, the third CWEF survey of this catchment in the 2007 to 2017 period, was carried out on the 21st of Sept 2017. The survey comprised 7 sites, 6 of which were included in the analysis. Salmon fry were present at all included sites. The maximum fry catch was 33 salmon at site 5. The mean catch of included sites was 24.09 salmon fry/5min. The modal length category of 0+ fry caught was 4.5cm.

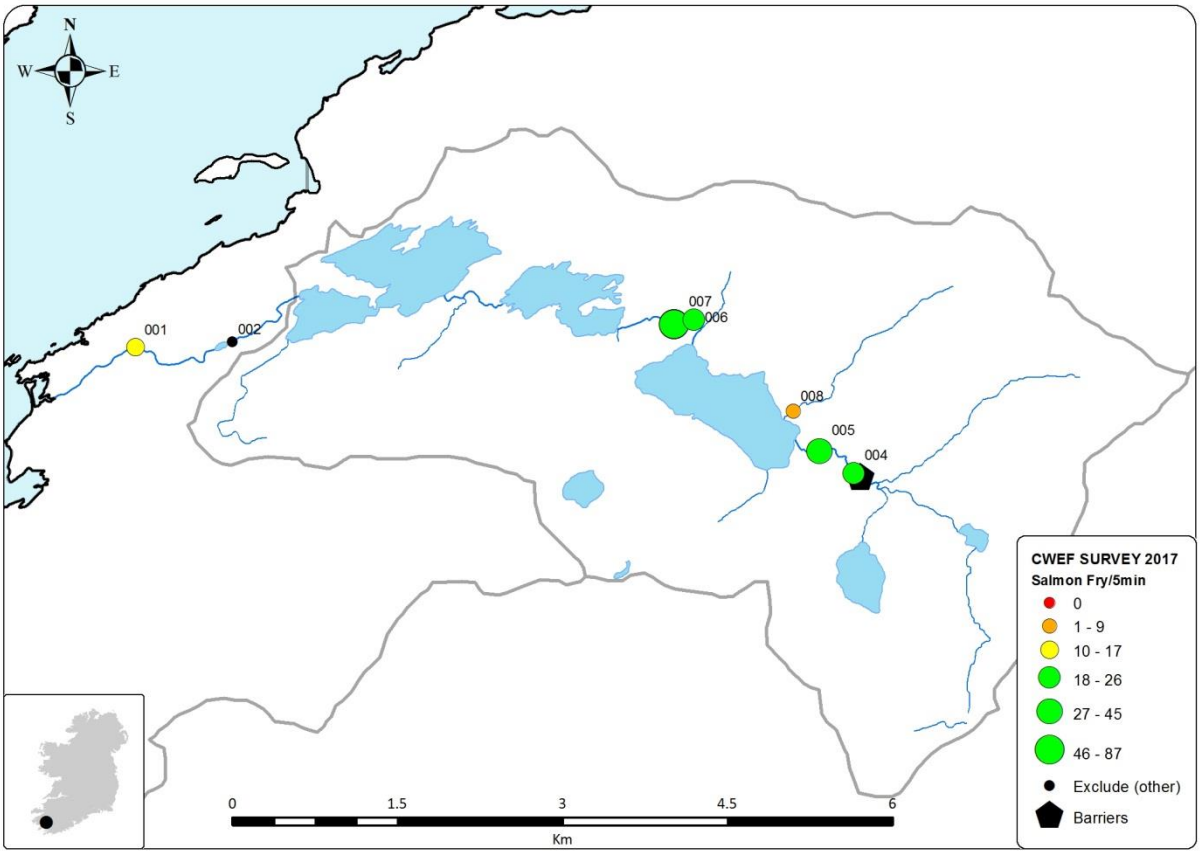
Conclusion

The Cloonee had a mean catch of 24.09 salmon fry/5min in 2017. Taking the three previous surveys into account this results in a cumulative average of 24.44 salmon fry/5min which is above the 17 salmon fry threshold.

Table A.4.3.2: Site specific results of CWEF on the Cloonee catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	V 78433 63466	3	3	3	10	Include	3.00	10.00
004	V 84968 62312	3	1	6	21	Include	7.11	24.89
005	V 84654 62520	3	1	2	33	Include	2.29	37.71
006	V 83515 63712	3	1	2	18	Include	2.80	25.20
007	V 83334 63672	3	1	6	29	Include	9.43	45.57
008	V 84419 62881	2	1	25	1	Include	29.81	1.19
002	V 79317 63511	3	2	-	-	Too Deep And Fast		

Map A.4.3.1 Showing the locations and results of 2017 CWEF surveys on the Cloonee River.



A.4.4. River Finnihy

IFI Salmon Catchment #:	69
2017 survey dates:	21/9/17
Mean Salmon Fry/5 min (2017):	0.58 fry/5min.
CWEF Index:	3.07 fry/5min.

Sampling carried out by:	**Fish Species Present:**
Andrew Quigley	Brown Trout
Sean Moran	European Eel
Tony Holmes	Stone Loach

Figure A.4.4.1: Length distribution of salmon captured in 2017 CWEF survey on the Finnihy Catchment.

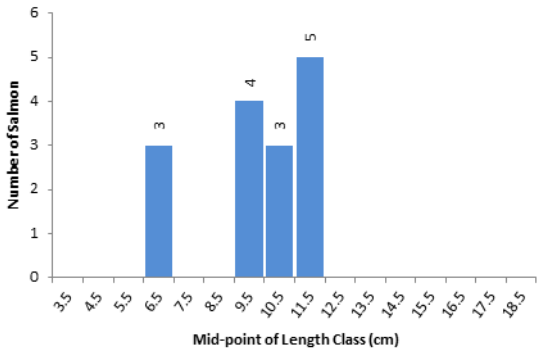


Figure A.4.4.2: Comparison of mean salmon fry/5min for all surveys on the Finnihy catchment to 2017.

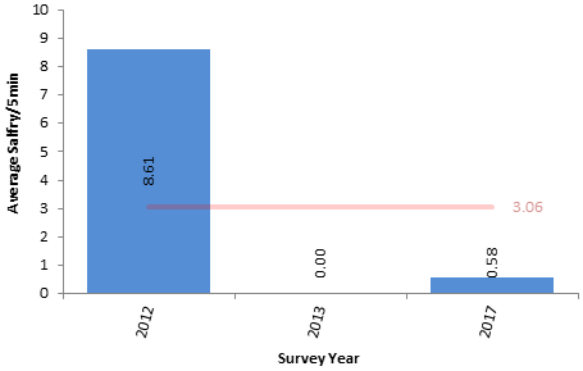


Table A.4.4.1: Conservation limits and provisional returns on the Finnihy catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	141	-56	Closed							
2008	2009	141	-56	Closed							
2009	2010	141	-63	Closed							
2010	2011	141	-63	Closed							
2011	2012	141	-63	Closed	6					3.68	8.61
2012	2013	141	-63	Closed	6					3.68	0.00
2013	2014	143	-77	Closed							
2014	2015	143	-77	Closed							
2015	2016	143	-77	Closed							
2016	2017	143	-77	Closed	6					3.68	0.58

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the third CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 6 sites, all of which were included in the analysis. Salmon fry were present at just 1 site. The maximum fry catch was 3 salmon at site 8. The mean catch of included sites was 0.58 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

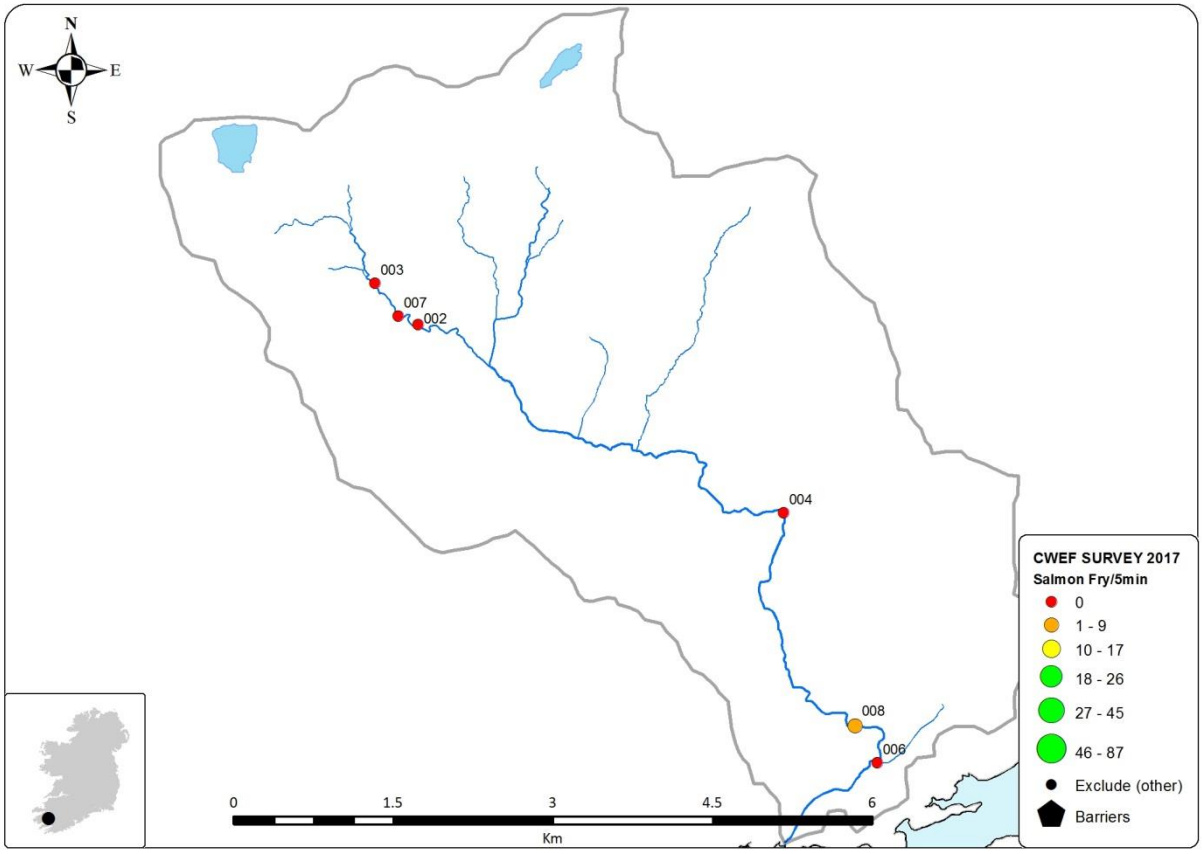
Conclusion

The Finnihy had a mean catch of 0.58 salmon fry/5min in 2017. Taking the three previous surveys into account the CWEF iverage is 3.07 salmon fry/5min, this is below the 17 salmon fry threshold. The numbers of fry observed in the 2017 and 2013 CWEF surveys were much lower than observed in the 2012 survey.

Table A.4.4.2: Site specific results of CWEF on the Finnihy catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
002	V 86608 75113	3	1	9	0	Include	11.00	0.00
003	V 86206 75501	3	1	4	0	Include	4.00	0.00
004	V 90044 73344	4	2	7	0	Include	9.00	0.00
006	V 90924 70988	4	1	4	0	Include	7.00	0.00
007	V 86424 75192	0	1	7	0	Include	10.00	0.00
008	V 90712 71335	0	1	3	3	Include	3.50	3.50

Map A.4.4.1 Showing the locations and results of 2017 CWEF surveys on the Finnihy River.



A.4.5. River Ferta

IFI Salmon Catchment #: 102
2017 survey dates: 25-26/9/2017
Mean Salmon Fry/5 min (2017): 6.88 fry/5min.
CWEF Index: 12.35 fry/5min.

Sampling carried out by:
Danny Breen
Tony Holmes

Fish Species Present:
Brown Trout
European Eel
Stone Loach
Salmon

Figure A.4.5.1: Length distribution of salmon captured in 2017 CWEF survey on the Ferta Catchment.

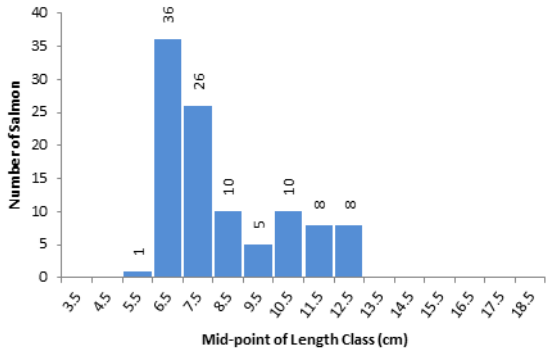


Figure A.4.5.2: Comparison of mean salmon fry/5min for all surveys on the Ferta catchment to 2017.

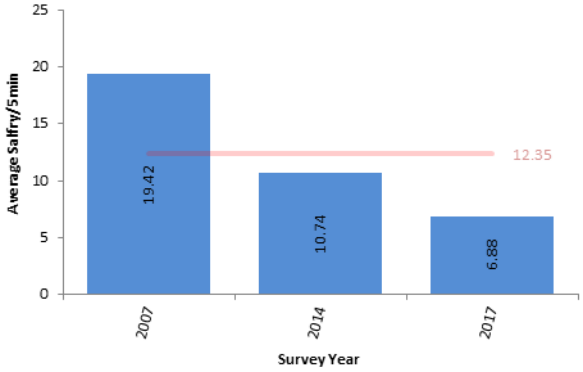


Table A.4.5.1: Conservation limits and provisional returns on the Ferta catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2006	2007			Open	8					4.30	19.42
2007	2008	197	-35	Open							
2008	2009	197	-34	Open							
2009	2010	197	-51	Open							
2010	2011	197	45	Open							
2011	2012	197	152	Open							
2012	2013	197	75	Open							
2013	2014	224	-44	Open	12	1				2.65	10.74
2014	2015	224	8	Catch Release							
2015	2016	224	85	Open							
2016	2017	224	117	Open	12	1		3		2.15	6.88

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the third CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 16 sites, 12 of which were included in the analysis. Salmon fry were present at 9 sites. The maximum fry catch was 14 salmon at site 14. The mean catch of included sites was 6.88 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm. Water levels during the survey this year were quite high which may have depressed the numbers slightly.

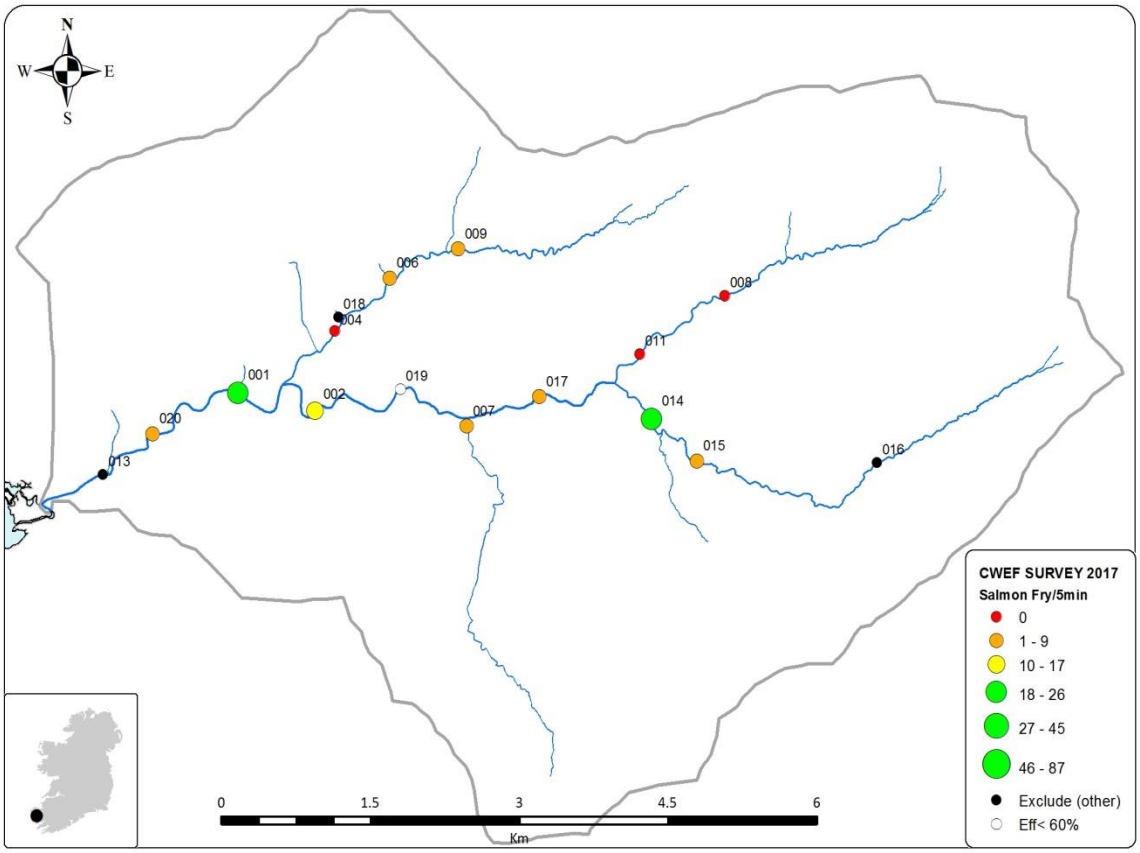
Conclusion

The Ferta had a mean catch of 6.88 salmon fry/5min in 2017. Taking the three previous surveys into account this results in a cumulative average of 12.35 salmon fry/5min which is below the 17 salmon fry threshold. There has been a reduction in the average numbers of fry caught at each survey since 2007.

Table A.4.5.2 Site specific results of CWEF on the Ferta catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	V 52107 82375	4	1	0	13	Include	0.00	18.00
002	V 52883 82209	4	2	1	12	Include	1.38	16.62
004	V 53084 82971	3	3	3	0	Include	3.00	0.00
006	V 53636 83477	3	1	3	2	Include	4.20	2.80
007	V 54409 82062	2	1	2	2	Include	2.50	2.50
008	V 57014 83309	3	2	6	0	Include	9.00	0.00
009	V 54323 83757	3	1	6	4	Include	8.40	5.60
011	V 56158 82748	3	2	1	0	Include	1.00	0.00
014	V 56274 82126	3	2	3	14	Include	3.71	17.29
015	V 56727 81727	3	2	4	7	Include	4.73	8.27
017	V 55142 82343	4	0	1	4	Include	1.20	4.80
020	V 51249 81987	4	0	2	4	Include	3.33	6.67
019	V 53747 82413	4	1	1	10	Eff <60%		
016	V 58547 81712	3	0	9	0	Above Salmon		
018	V 53120 83103	2	1	13	1	Channel too Small		
013	V 50751 81597	4	2	0	0	Water too High		

Map A.4.5.1: Showing the locations and results of 2017 CWEF surveys on the Ferta River.



A.4.6. River Laune

IFI Salmon Catchment #: 106
2017 survey dates: 28/8/2017 to 26/9/2017
Mean Salmon Fry/5 min (2017): 21.41 fry/5min.
CWEF Index: 21.41 fry/5min.

Sampling carried out by:
Andrew Quigley
Danny Breen
Darragh King
Mick Millane
Sean Moran
Tony Holmes

Fish Species Present:
Brown Trout
European Eel
Minnow
Salmon
Stone Loach
3-Spined Stickleback

Figure A.4.6.1: Length distribution of salmon captured in 2017 CWEF survey on the Laune Catchment.

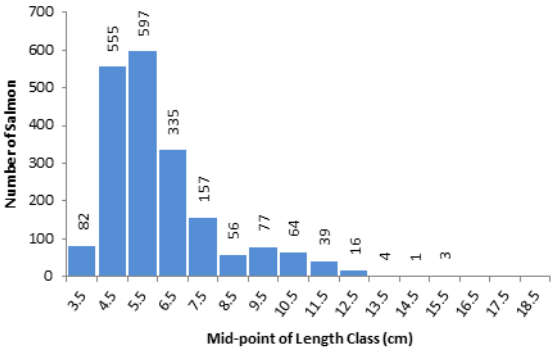


Figure A.4.6.2: Comparison of mean salmon fry/5min for all surveys on the Laune catchment to 2017.

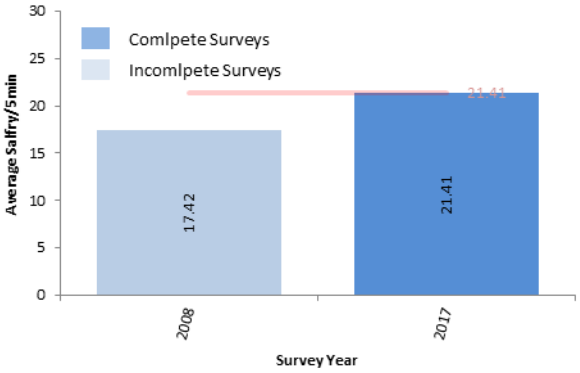


Table A.4.6.1: Conservation limits and provisional returns on the Laune catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	2738	6199	Open	9	1		2		42.60	17.42†
2008	2009	1839	6426	Open							
2009	2010	2554	5109	Open							
2010	2011	2554	6244	Open							
2011	2012	2554	5109	Open							
2012	2013	2554	5109	Open							
2013	2014	2070	4140	Open							
2014	2015	2071	4143	Open							
2015	2016	2071	4143	Open							
2016	2017	2071	3899	Open	97	1	3	10		4.60	21.41

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; † = Sub-catchment Surveys.

This, the first complete CWEF survey of this catchment, a survey of the Cotteners catchment had been undertaken in 2008. The 2017 survey was carried out during Sept 2017. The survey comprised 111 sites, 97 of which were included in the analysis. Salmon fry were present at 81 sites. The maximum fry catch was 78 salmon at site 57. Of the sites included in calculating the CWEF average 40% (n=40) had fry numbers greater than 17 fry $5min^{-1}$. The modal length category of 0+ fry caught was 5.5cm. Water

levels throughout the survey period were often high. The water levels on the main channel were not sufficiently low to allow extensive sampling of the main channel. The mean catch of included sites was 21.41 salmon fry/5min.

Conclusion

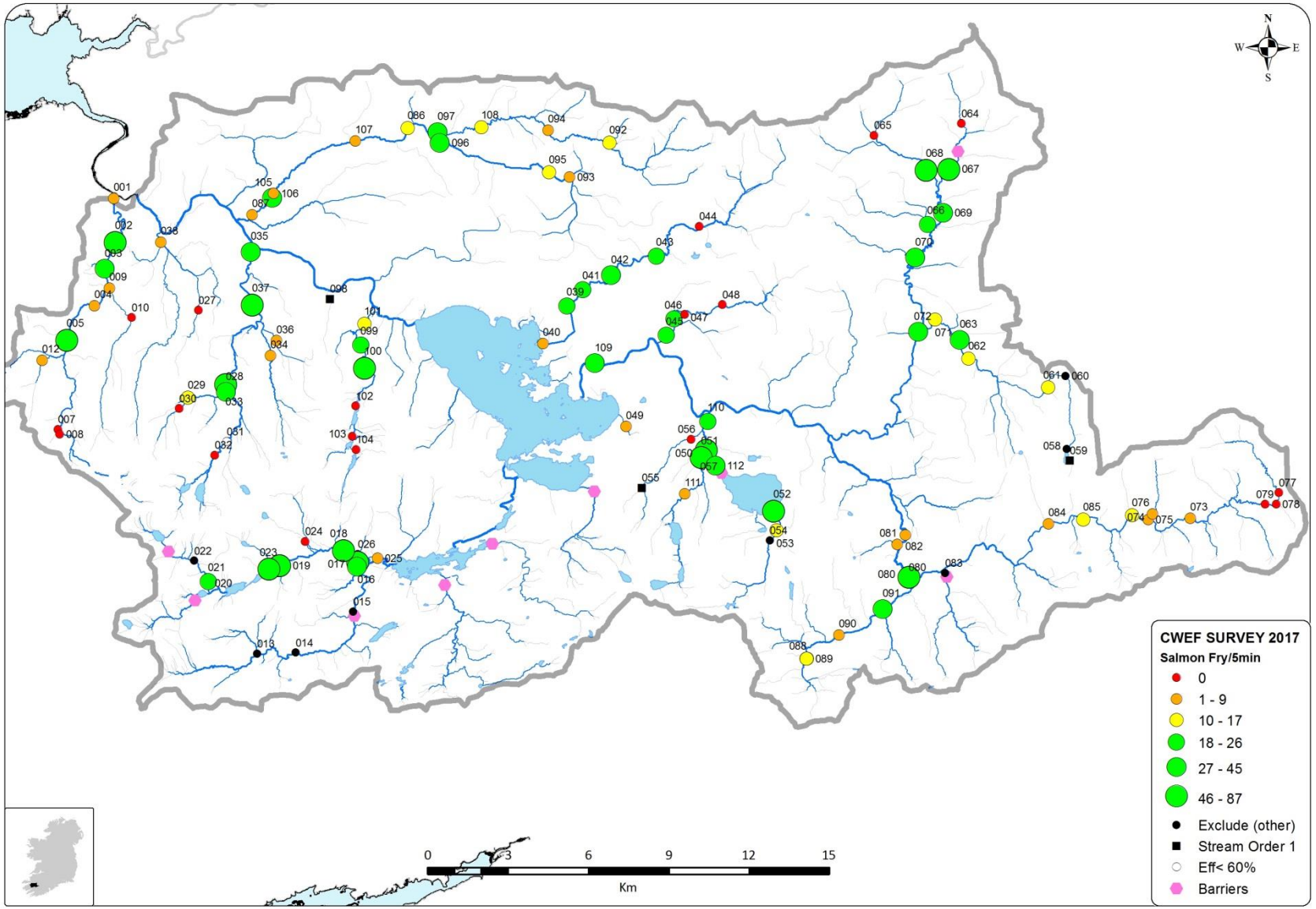
The Laune had a mean catch of 21.41 salmon fry/5min in 2017. As this is the first complete CWEF survey of this catchment this value is used as the CWEF average also; The 21.41 figure is above the 17 salmon fry threshold.

Table A.4.6.2: Site specific results of CWEF on the Laune catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	V 78617 95555	4	1	2	1	Include	2	1
002	V 78666 93927	4	1	2	42	Include	2.32	48.68
003	V 78287 92942	4	2	1	26	Include	1.07	27.93
004	V 77917 91552	4	2	8	4	Include	8	4
005	V 76875 90273	4	1	14	54	Include	15.65	60.35
007	V 76556 86941	3	0	25	0	Include	32	0
008	V 76632 86762	3	0	15	0	Include	21	0
009	V 78475 92214	2	1	11	4	Include	14.67	5.33
010	V 79304 91117	2	2	17	0	Include	19	0
012	V 75957 89515	2	3	12	1	Include	12	1
016	V 87765 82013	4	1	2	49	Include	2.39	58.61
017	V 87754 81853	4	1	3	34	Include	3.65	41.35
018	V 87239 82453	4	1	0	34	Include	0	49
019	V 84860 81882	4	1	1	53	Include	1.28	67.72
020	V 82446 80979	4	1	4	74	Include	4.77	88.23
021	V 82181 81284	3	3	0	17	Include	0	19
023	V 84453 81746	2	1	3	35	Include	4.18	48.82
024	V 85806 82788	2	2	10	0	Include	15	0
025	V 88513 82168	5	2	1	2	Include	1.67	3.33
027	V 81807 91394	2	3	3	0	Include	4	0
028	V 82832 88359	3	2	12	32	Include	16.09	42.91
029	V 81417 88130	3	2	8	14	Include	8	14
030	V 81092 87727	2	2	27	0	Include	32	0
032	V 82422 85996	4	3	3	0	Include	6	0
033	V 82817 88636	4	3	0	40	Include	0	55
034	V 84490 89703	3	1	33	6	Include	39.77	7.23
035	V 83749 93588	4	1	1	33	Include	1.29	42.71
036	V 84724 90265	2	2	26	2	Include	26	2
037	V 83806 91597	4	2	4	35	Include	5.54	48.46
038	V 80392 93932	3	3	4	6	Include	4.8	7.2
039	V 95563 91598	4	1	10	13	Include	13.48	17.52
040	V 94685 90194	4	1	8	5	Include	11.08	6.92
041	V 96139 92208	4	2	12	20	Include	13.88	23.13
042	V 97214 92755	4	1	4	26	Include	4.67	30.33
043	V 98899 93467	4	1	5	18	Include	7.17	25.83
044	W 00504 94580	4	2	16	0	Include	18	0
045	V 99279 90512	3	2	11	19	Include	14.67	25.33
046	V 99554 91122	3	2	4	19	Include	4.35	20.65
047	V 99974 91285	3	3	5	0	Include	5	0
048	W 01381 91666	3	2	10	0	Include	10	0
049	V 97796 87100	2	2	7	1	Include	7.88	1.13
050	W 00795 86230	4	1	1	59	Include	1.33	78.67
051	W 00606 85952	3	1	6	51	Include	7.89	67.11
052	W 03317 83963	3	1	5	65	Include	6.07	78.93
053	W 03427 83245	3	2	2	12	Include	2	12
056	W 00230 86636	2	2	15	0	Include	17	0
057	W 00472 85615	3	1	5	78	Include	7.11	110.89
061	W 13558 88600	2	2	8	14	Include	8.73	15.27
062	W 10583 89672	3	2	3	13	Include	3.75	16.25
063	W 10259 90378	3	2	5	35	Include	5.63	39.38
064	W 10296 98437	2	2	10	0	Include	12	0
065	W 07036 97993	3	1	25	0	Include	27	0

Table A.4.6.2: Site specific results of CWEF on the Laune catchment in 2017. (Cont.)

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
066	W 09036 94685	3	2	8	23	Include	9.03	25.97
067	W 09826 96737	3	1	4	32	Include	5.67	45.33
068	W 08983 96699	3	2	1	40	Include	1.24	49.76
069	W 09615 95118	4	1	6	24	Include	7.4	29.6
070	W 08583 93443	4	1	3	33	Include	3.33	36.67
071	W 09329 91127	3	3	5	9	Include	6.79	12.21
072	W 08711 90672	4	2	3	28	Include	3.97	37.03
073	W 18893 83736	3	2	4	4	Include	4	4
074	W 17479 83885	2	2	4	4	Include	5	5
075	W 17316 83690	3	2	2	4	Include	2.67	5.33
076	W 16711 83846	3	2	2	14	Include	2.25	15.75
077	W 22196 84710	2	2	10	0	Include	10	0
078	W 22110 84276	2	1	23	0	Include	25	0
079	W 21687 84270	3	2	8	0	Include	10	0
080	W 08379 81517	5	1	1	54	Include	1	54
081	W 07940 82727	2	2	13	3	Include	13	3
082	W 08244 83089	5	1	0	7	Include	0	7
084	W 13595 83516	3	2	3	6	Include	3.67	7.33
085	W 14896 83677	3	2	2	10	Include	2	10
086	V 89599 98215	4	2	1	9	Include	1.2	10.8
087	V 83790 94957	4	2	2	2	Include	2	2
088	W 04569 78460	3	2	5	13	Include	5.28	13.72
089	W 04564 78455	3	2	6	11	Include	6.35	11.65
090	W 05773 79342	4	0	3	9	Include	3	9
091	W 07401 80333	4	2	3	40	Include	3	40
092	V 97137 97689	3	1	44	13	Include	45.54	13.46
093	V 95653 96408	4	2	19	6	Include	20.52	6.48
094	V 94857 98151	3	2	9	9	Include	9	9
095	V 94893 96577	4	2	7	11	Include	8.17	12.83
096	V 90806 97674	4	1	32	26	Include	33.1	26.9
097	V 90714 98074	3	2	3	32	Include	3	32
099	V 87853 90124	3	2	4	20	Include	4	20
100	V 87997 89254	3	2	5	48	Include	5	48
101	V 88008 90901	3	2	0	17	Include	0	17
102	V 87690 87844	3	3	0	0	Include	0	0
103	V 87568 86703	3	2	2	0	Include	2	0
104	V 87705 86219	2	2	12	0	Include	12	0
105	V 84546 95598	4	1	0	32	Include	0	34
106	V 84599 95760	4	2	6	4	Include	6	4
107	V 87639 97727	4	2	9	4	Include	9	4
108	V 92345 98243	3	1	5	12	Include	5	12
109	V 96611 89469	5	1	0	21	Include	0	29
110	W 00839 87310	4	2	2	15	Include	2.94	22.06
111	W 00000 84604	3	2	4	3	Include	5.14	3.86
112	W 01138 85662	3	1	7	22	Include	10.62	33.38
031	V 82875 86498	4	3	2	2	Eff <60%		
055	V 98400 84824	1	2	23	0	Stream Order<2		
059	W 14393 85884	1	2	30	0	Stream Order<2		
098	V 86709 91836	1	2	56	0	Stream Order<2		
013	V 84037 78594	4	1	2	0	Above Barrier		
014	V 85474 78644	4	1	3	0	Above Barrier		
083	W 09734 81683	3	3	1	0	Above Barrier		
022	V 81666 82060	3	3	3	0	Above Barrier?		
054	W 03189 82877	3	1	2	0	Above Barrier?		
080	W 08379 81517	5	2	0	22	Exclude		
026	V 87788 82320	2	1	10	0	Too Narrow		
058	W 14273 86317	2	3	3	0	Above Salmon		
060	W 14222 89038	2	2	5	1	Tunnelled		
015	V 87614 80177	4	3	0	0	Poor Fry Habitat.		



Map A.4.6.1: Showing locations of 2017 survey sites on Laune River.

A.4.7. River Maine - Brown Flesk

IFI Salmon Catchment #: 107
2017 survey dates: 18-19/9/2017
Mean Salmon Fry/5 min (2017): 22.05 fry/5min.
CWEF Index: 32.35 fry/5min.

Sampling carried out by:
Stephen Gill
Tony Holmes

Fish Species Present:

Brown Trout	Salmon
European Eel	Stone Loach
Minnow	3-Spined Stickleback

Figure A.4.7.1: Length distribution of salmon captured in 2017 CWEF survey on the Brown Flesk Catchment.

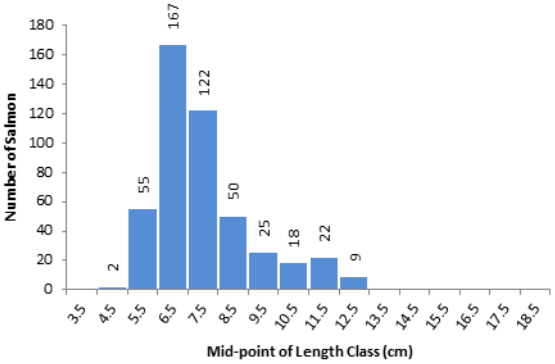


Figure A.4.7.2: Comparison of mean salmon fry/5min for all surveys on the Maine catchment to 2017.

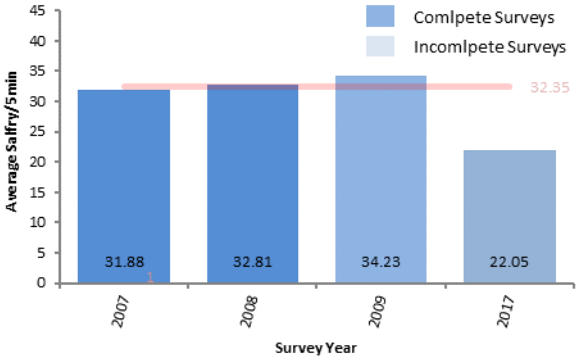


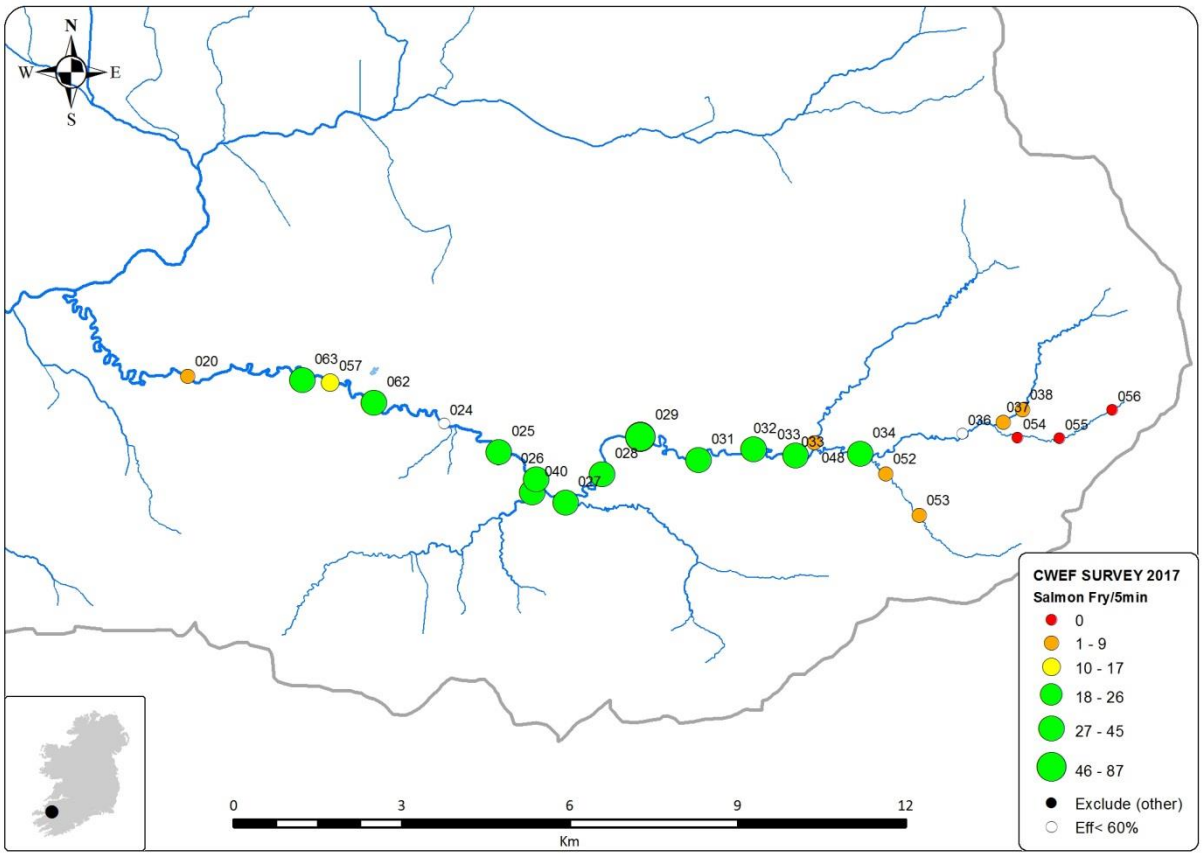
Table A.4.7.1: Conservation limits and provisional returns on the Maine catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2006	2007	100	1	Open	55			1		3.35	31.88
2007	2008	1487	652	Open	48		1	2	1	3.60	32.81
2008	2009	1487	-743	Open	16	1				11.02	34.23*
2009	2010	1487	-871	Open							
2010	2011	1487	-792	Open							
2011	2012	1487	-475	Open							
2012	2013	1487	1509	Open							
2013	2014	1177	1709	Open							
2014	2015	1181	1637	Open							
2015	2016	1181	1156	Open							
2016	2017	1181	923	Open	22	2		1		7.49	22.05*

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; * = Incomplete/Partial Surveys.

This survey of the Maine catchment was specifically targeted to assess the extent and success of spawning on the Brown Flesk sub-catchment. The survey was carried out during Sept 2017 and comprised 25 sites. Salmon fry were present at 22 sites. The maximum fry catch was 32 salmon at sites twenty-nine and thirty-one. The mean catch of included sites was 22.05 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

Map A.4.7.1: Showing locations of 2017 survey sites on Brown Flesk Tributary of the Maine.



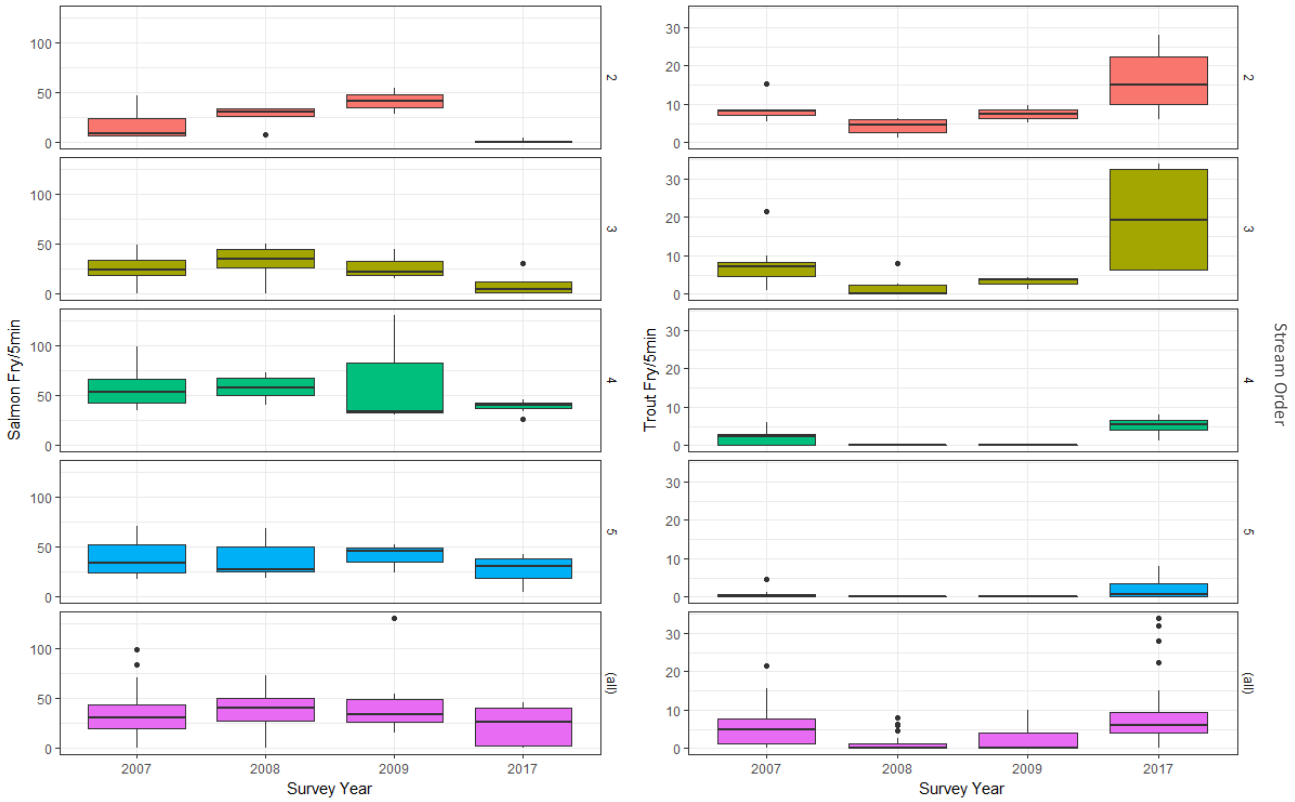
Conclusion

Good levels of spawning had occurred throughout the Brown Flesk sub-catchment in 2016. The distribution of salmon fry was comparable with that observed in previous CWEF surveys on the system. Three previous surveys have been undertaken on the Maine. The survey in 2009, while extensive was not as intensive as those in 2007 and 2008. When ranges of salmon numbers observed during the four surveys compared (fig A.4.9.3, bottom left panel) salmon fry numbers have remained broadly similar on the main channels, salmon fry abundance on the lower order stream has fallen.

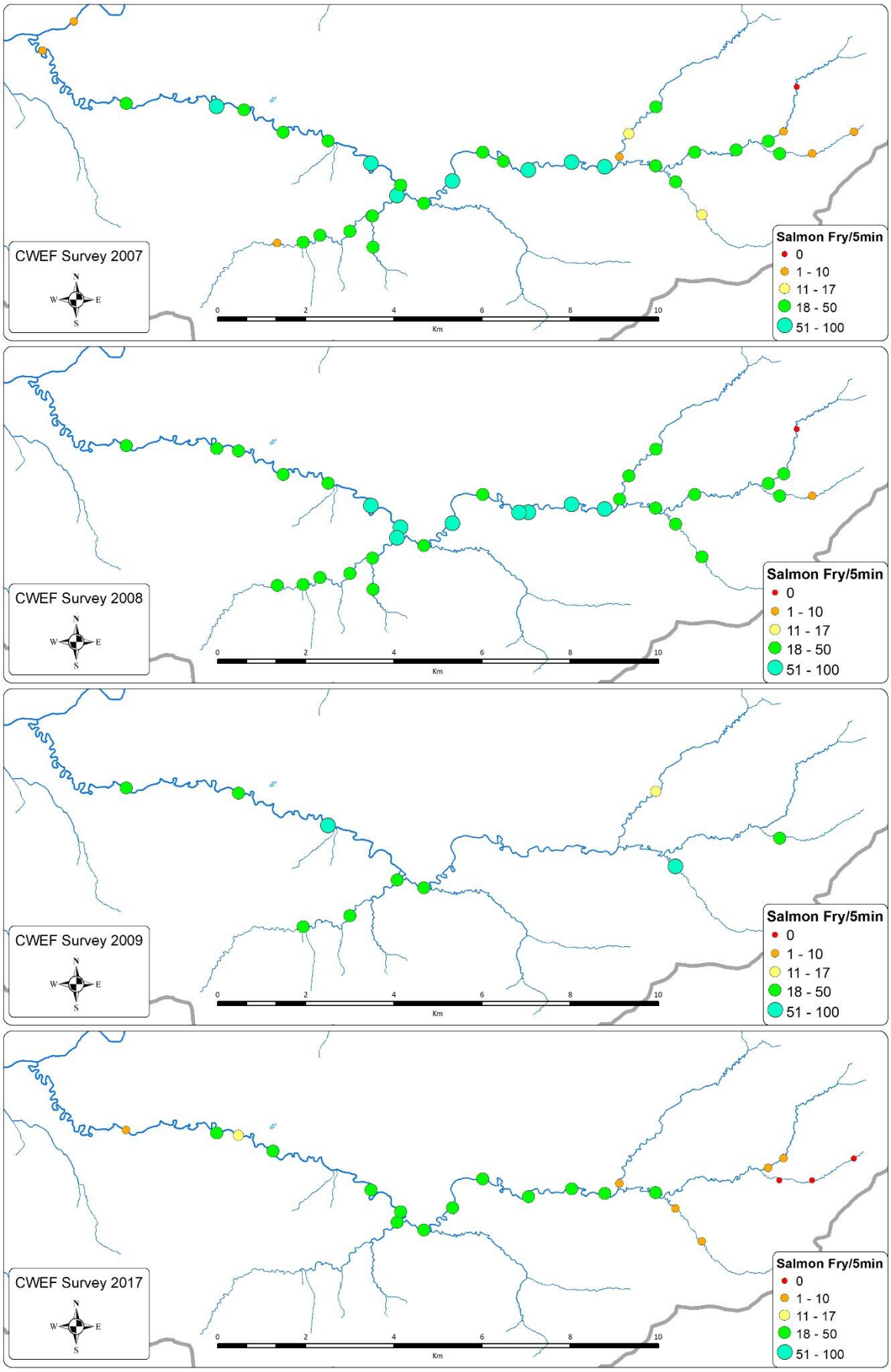
Table A.4.7.2: Site specific results of CWEF on Maine in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Trout Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
020	Q 94995 04605	5	0	0	5	Include	0	5
025	R 00554 03263	5	1	3	25	Include	4.07	33.93
026	R 01222 02777	5	0	0	30	Include	0	40
027	R 01748 02360	4	1	4	31	Include	5.71	44.29
028	R 02401 02869	4	1	1	21	Include	1.27	26.73
029	R 03087 03523	4	0	3	32	Include	4.29	45.71
031	R 04122 03121	4	1	3	32	Include	3.86	41.14
032	R 05103 03307	4	0	5	28	Include	7.27	40.73
033	R 05856 03201	4	1	6	26	Include	7.88	34.13
034	R 07005 03225	3	0	5	26	Include	5.97	31.03
037	R 09562 03788	3	1	32	2	Include	32	2
038	R 09912 04007	3	0	34	1	Include	34	1
040	R 01145 02539	4	0	4	30	Include	5.41	40.59
048	R 06191 03425	3	2	5	5	Include	6.5	6.5
052	R 07464 02865	2	0	28	2	Include	28	2
053	R 08062 02122	2	2	19	4	Include	22.3	4.7
054	R 09819 03509	2	2	15	0	Include	15	0
055	R 10564 03509	2	2	8	0	Include	10	0
056	R 11511 04006	2	2	5	0	Include	6	0
057	Q 97539 04497	5	1	6	12	Include	8	16
062	Q 98324 04139	5	1	0	30	Include	0	43
063	Q 97044 04544	5	1	1	19	Include	1.4	26.6
024	Q 99575 03770	5	1	0	7	Eff <60%		
036	R 08837 03588	3	1	3	5	Eff <60%		
033	R 05856 03201	4	1	9	12	Exclude		

Figure A.4.7.3: Boxplot of number of salmon/5min electrofishing obtained at sites visited at each survey 2007, 2008 and 2017.



Map A.4.7.2: Showing results of all CWEF surveys on Brown Flesk Tributary of the Maine.



A.4.8. River Lee (Tralee)

IFI Salmon Catchment #: 117
2017 survey dates: 28 & 29/9/2017
Mean Salmon Fry/5 min (2017): 0.69 fry/5min.
CWEF Index: 0.68 fry/5min.

Sampling carried out by:
Danny Breen
Tony Holmes

Fish Species Present:
Brown Trout
European Eel
Stone Loach
Salmon
3-Spined Stickleback

Figure A.4.8.1: Length distribution of salmon captured in 2017 CWEF survey on the Lee Catchment.

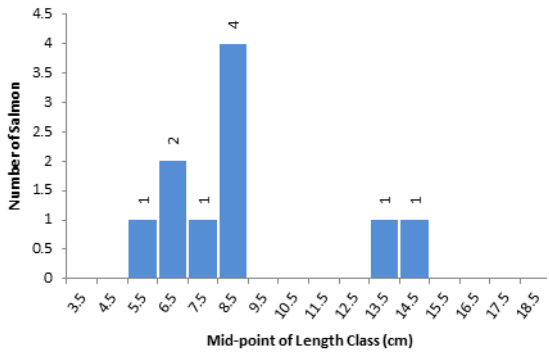


Figure A.4.8.2: Comparison of mean salmon fry/5min for all surveys on the Lee catchment to 2017.

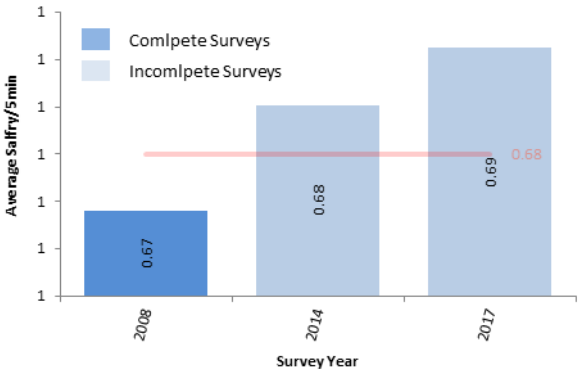


Table A.4.8.1: Conservation limits and provisional returns on the Lee (Tralee) catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	585	-229	Closed	30	4				2.58	0.67
2008	2009	585	-229	Closed							
2009	2010	585	-262	Closed							
2010	2011	585	-262	Closed							
2011	2012	585	-262	Closed							
2012	2013	585	-229	Closed							
2013	2014	508	-247	Closed	19					4.61	0.68*
2014	2015	507	-246	Closed							
2015	2016	507	-246	Closed							
2016	2017	507	-246	Closed	12		1			6.74	0.69*

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; * = Incomplete Surveys.

This, the third CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 13 sites, 12 of which were included in the analysis. Salmon fry were present at 5 sites. The maximum fry catch was 2 salmon at site 9. The mean catch of included sites was 0.69 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm. Salmon fry were restricted to a section of river upstream to the east of Tralee around Ballyseedy. High water levels curtailed the extent of the survey.

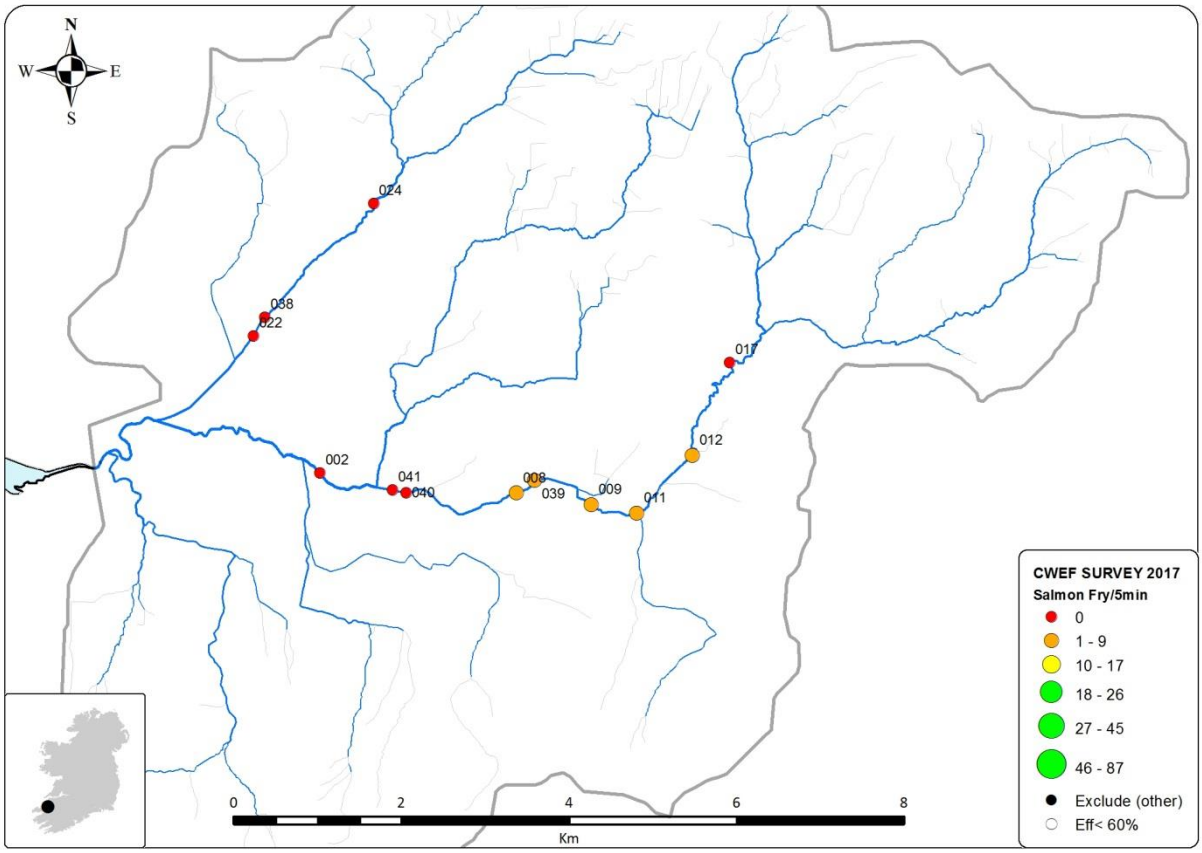
Conclusion

The Lee had a mean catch of 0.69 salmon fry/5min in 2017. This is very much on a par with previous results.

Table A.4.8.1: Site specific results of CWEF on the Lee (Tralee) catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
002	Q 84799 13147	5	0	4	0	Include	4	0
008	Q 87142 12908	4	0	4	1	Include	4	1
009	Q 88039 12769	4	1	7	2	Include	7	2
011	Q 88584 12668	4	1	10	1	Include	10	1
012	Q 89244 13361	4	0	16	1	Include	19.76	1.24
017	Q 89694 14469	4	1	5	0	Include	6	0
022	Q 84005 14791	4	0	4	0	Include	4	0
024	Q 85440 16377	4	0	2	0	Include	2	0
038	Q 84144 15008	4	2	2	0	Include	2	0
039	Q 87362 13057	4	3	5	3	Include	5	3
040	Q 85831 12908	4	3	7	0	Include	9	0
041	Q 85667 12944	4	2	11	0	Include	13	0
037	Q 89531 13608	1	3	8	0	Stream Order<2		

Map A.4.8.1: Showing locations of 2017 survey sites on Lee (Tralee) River.



A.5.Shannon River Basin District.

Summary

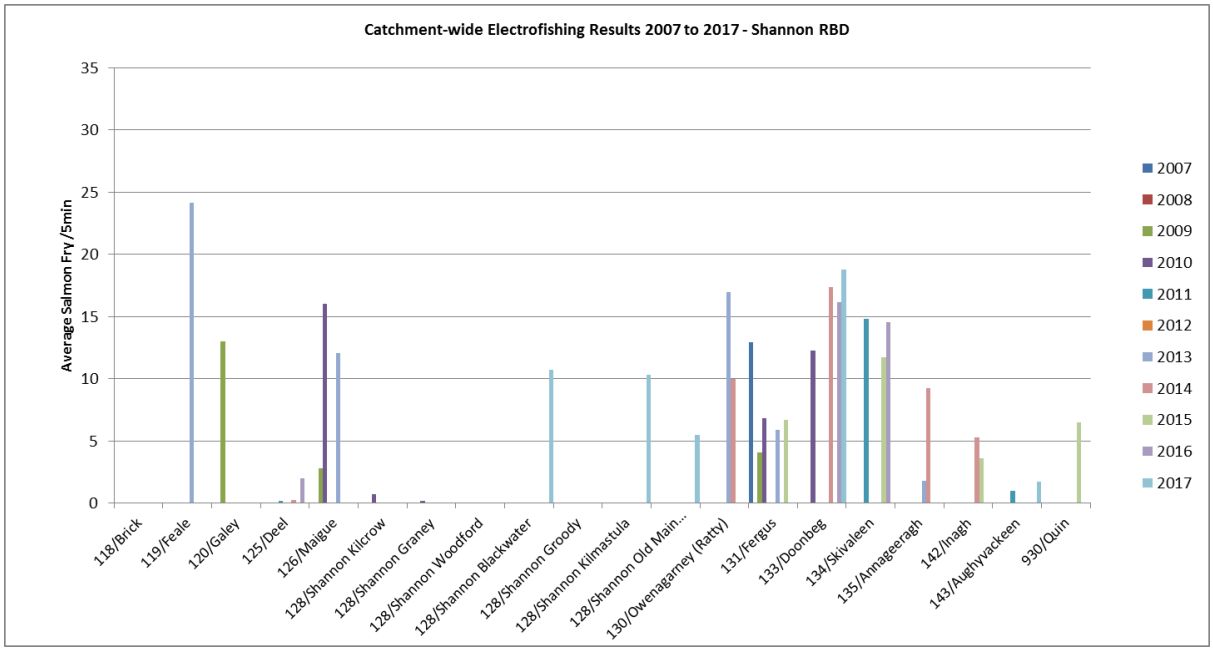
Since 2007, twenty catchments or sub catchments have been surveyed in the Shannon River Basin District (ShRBD) as part of the on-going catchment-wide electrofishing surveys. These are presented in (Table A.5.1). At present just one river is meeting the threshold of 17 salmon fry per 5min. In this region in 2017 six CWEF surveys were undertaken. These were conducted on the Deel, Doonbeg and Aughyvackeen catchments and the Blackwater, Groody and Kilmastula sub catchments of the lower Shannon along with the old River Shannon channel.

Table A.5.1: Catchment-wide Electrofishing data for the Shannon River Basin District 2007-2017 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

	Survey Year										Current Index	# Annual Surveys Considered
Code/River	**2007**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**		
118/Brick	**0.00**										0.00	1
119/Feale						**24.15**					24.15	1
120/Galey		**12.99**									12.99	1
125/Deel				**0.18**			**0.23**		1.96†	**0.04**	0.15	3
126/Maigue		**2.82**	**16.05**			**12.05**					10.31	3
128/Shan. Kilcrow			**0.69**								0.69	1
128/Shan. Graney			**0.19**								0.19	1
128/Shan. Woodfd			**0.00**								0.00	1
128/Shan. Blackwt										10.74*		
128/Shan. Groody										0.00*		
128/Shan. Kilmast										10.35*		
128/Shan. Old Ch										5.50*†		
130/Owenagarney						**16.97**	**9.97**				13.47	2
131/Fergus	**12.96**	**4.10**	**6.84**			**5.89**		**6.66**			7.29	5
133/Doonbeg			**12.28**				**17.39**		16.14†	**18.77**	16.15	3
134/Skivaleen				**14.82**				**11.70**	14.54†		13.26	2
135/Annageeragh						**1.82**	**9.24**				5.53	2
142/Inagh							**5.31**	**3.59**			4.45	2
143/Aughyvackeen				**1.00**						**1.70**	1.35	2
930/Quin								**6.47**			6.47	1

Bold annual figures indicate years included in calculation of current CWEF index.
Underlined index figures indicate those exceeding the 17 salmon fry threshold.
* Sub-catchment surveys/ not included in calculation of current index.
† Partial/incomplete surveys curtailed by high water levels.

Figure A.5.1: Summary of CWEF results in Shannon River basin district 2007-2017.



A.5.1. River Deel

IFI Salmon Catchment #: 125
2017 survey dates: 10/8/2017 to 29/8/2017
Mean Salmon Fry/5 min (2017): 0.04 fry/5min.
CWEF Index: 0.15 fry/5min.

Sampling carried out by:
David Germaine
Liam Horrigan

Fish Species Present:

Brown Trout	Salmon
Crayfish	Stone Loach
European Eel	3-Spined Stickleback
Minnow	

Figure A.5.1.1: Length distribution of salmon captured in 2017 CWEF survey on the Deel Catchment.

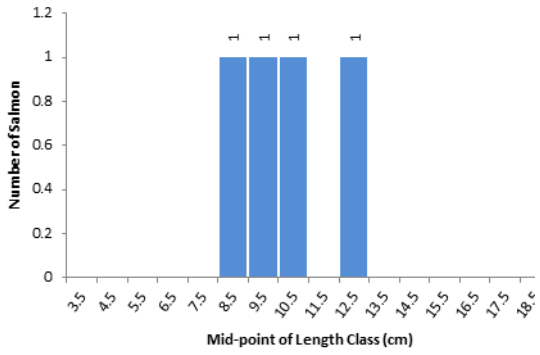


Figure A.5.1.2: Comparison of mean salmon fry/5min for all surveys on the Deel catchment to 2017.

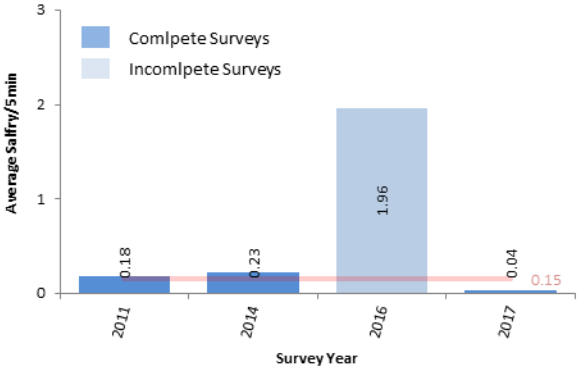


Table A.5.1.1: Conservation limits and provisional returns on the Deel catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	2462	-1189	Closed							
2008	2009	2462	-1189	Closed							
2009	2010	2462	-1189	Closed							
2010	2011	2462	-1189	Closed	31					2.54	0.18
2011	2012	2462	-1189	Closed							
2012	2013	2462	-1189	Closed							
2013	2014	2823	-1821	Closed	25					2.44	0.23
2014	2015	2823	-1817	Closed							
2015	2016	2823	-1817	Closed	22					10.47	1.96†
2016	2017	2823	-1817	Closed	27			2		8.66	0.04

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; † Incomplete surveys not included in calculation of current index.

This, the fourth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during August 2017. The survey comprised 29 sites, 27 of which were included in the analysis. Salmon fry was present at just 1 site - site 19, where just one salmon fry of 8cm was observed. The mean catch of included sites was 0.04 salmon fry/5min. In all just four salmon of any size were observed on the Deel.

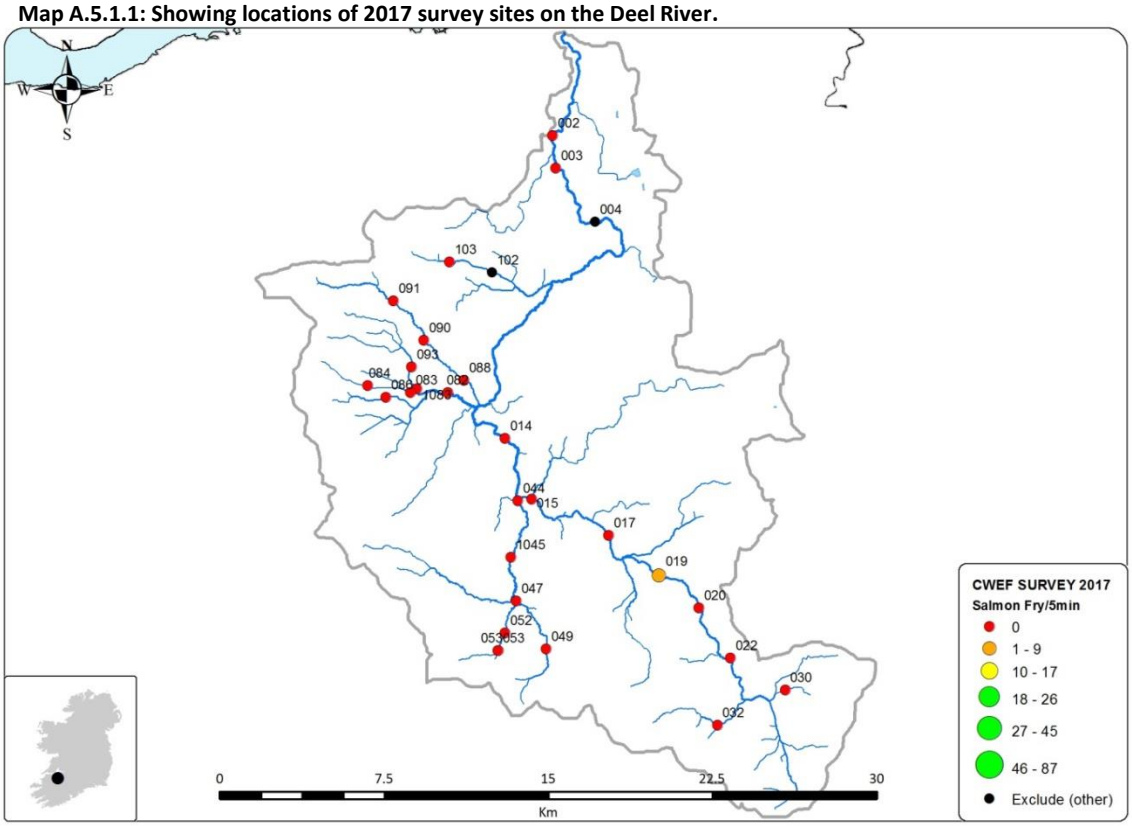
Conclusion

The Deel had a mean catch of 0.04 salmon fry/5min in 2017. Taking the previous three surveys into account this results in a cumulative average of 0.15 salmon fry/5min which is considerably below the 17 salmon fry threshold.

Table A.5.1.2: Site specific results of CWEF on the Deel catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
DL02	R 33450 45277	6	3	0	0	Include	0.00	0.00
DL03	R 33593 43776	6	2	1	0	Include	1.00	0.00
DL14	R 31289 31399	5	3	0	0	Include	0.00	0.00
DL15	R 32489 28617	4	1	0	0	Include	0.00	0.00
DL17	R 36005 26972	4	2	0	0	Include	0.00	0.00
DL19	R 38315 25134	4	2	1	1	Include	1.00	1.00
DL20	R 40134 23659	4	2	1	0	Include	1.00	0.00
DL22	R 41578 21353	4	1	6	0	Include	6.00	0.00
DL30	R 44080 19900	2	1	0	0	Include	0.00	0.00
DL32	R 40981 18276	3	1	0	0	Include	0.00	0.00
DL44	R 31869 28545	4	1	2	0	Include	2.00	0.00
DL47	R 31785 23969	4	2	22	0	Include	22.00	0.00
DL49	R 33162 21778	3	2	29	0	Include	29.00	0.00
DL52	R 31286 22500	3	3	0	0	Include	0.00	0.00
DL51	R 30953 21693?	3	2	17	0	Include	17.00	0.00
DL53	R 30953 21693?	3	1	24	0	Include	24.00	0.00
DL82	R 28658 33496	5	3	10	0	Include	10.00	0.00
DL83	R 26954 33516	3	1	21	0	Include	21.00	0.00
DL84	R 25019 33814	2	1	18	0	Include	18.00	0.00
DL86	R 25843 33292	3	1	7	0	Include	7.00	0.00
DL88	R 29408 34067	3	1	22	0	Include	22.00	0.00
DL90	R 27579 35906	3	2	10	0	Include	10.00	0.00
DL91	R 26174 37711	3	1	5	0	Include	5.00	0.00
DL93	R 27004 34681	3	1	7	0	Include	7.00	0.00
DL103	R 28746 39476	3	1	0	0	Include	0.00	0.00
DL45a	R 31559 25967	4	2	7	0	Include	7.00	0.00
DL83a	R 27256 33683	3	1	16	0	Include	16.00	0.00
DL04	R 35396 41314	6	3	0	0	Unsuitable Habitat		
DL102	R 30694 38997	3	2	0	0	Overgrown/V Shallow		

Map A.5.1.1: Showing locations of 2017 survey sites on the Deel River.



A.5.2. River Shannon

IFI Salmon Catchment #: 128
2017 survey dates: 19-27/7/17 and 15/9/2017

Sampling carried out by:
Catheine Hayes
David Germaine
Lorraine O'Donnel
Ray Byrne
Ryan Grey

Fish Species Present:
Brown Trout
Crayfish
Dace
European Eel
Gudgeon
Lamprey
Minnow
Pike
Salmon
Stone Loach
3-Spined Stickleback

Figure A.5.2.1: Length distribution of salmon captured in the Shannon Blackwater 2017 CWEF.

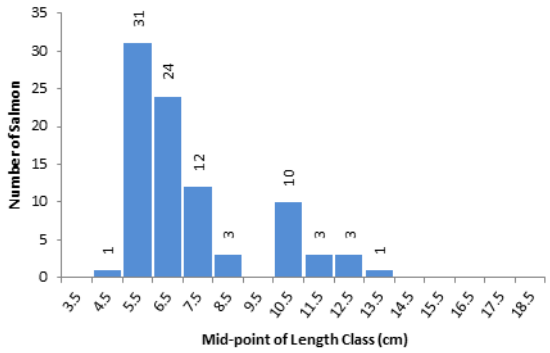


Figure A.5.2.2: Length distribution of salmon captured in the Shannon Kilmastula 2017 CWEF.

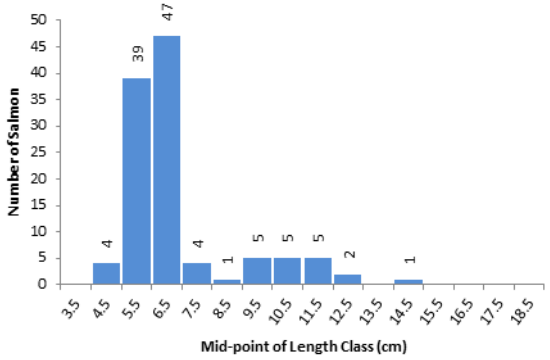


Figure A.5.2.3: Length distribution of salmon captured in the Shannon Old main channel 2017 CWEF.

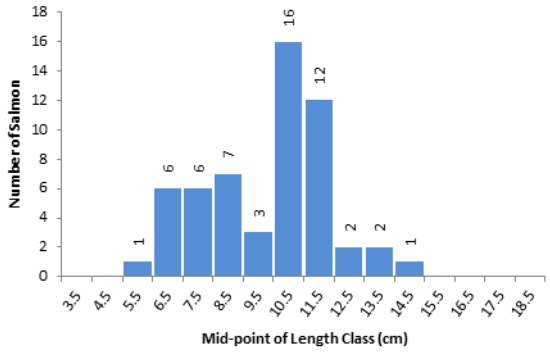


Figure A.5.2.4: Length distribution of salmon captured in the Shannon survey 2017 CWEF.

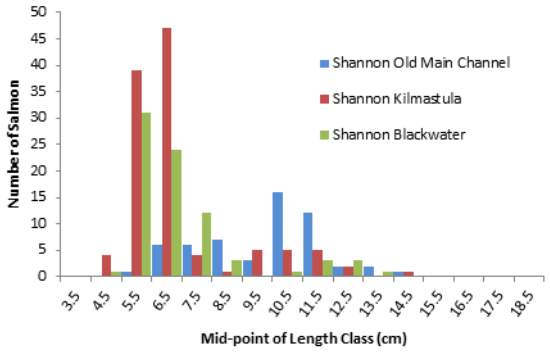


Table A.5.2.1: Summary of results of Catchment wide electrofishing in 2017 on sub-catchments within ShRFB.

Code	River	SalFry5min	TrFry5min	# included sites	# sites not fished
128	Shannon Blackwater	10.74	1.76	8	12
128	Shannon Groody	0.00	9.50	2	11
128	Shannon Kilmastula	10.35	5.93	11	6
128	Shannon Castleconnell / Old Main Ch.	5.50	1.50	4	1

Surveys were undertaken in four discrete areas in the lower Shannon: the sub-catchments Blackwater, Groody and Kilmastula, plus the old main channel below the Parteen weir in the vicinity of Castleconnell. Results for each area are presented in table A.5.2.1.

Blackwater - Surveys on the Blackwater indicate there was a potential partial barrier to salmon in the region where the original river flows beneath the headrace. Downstream of that point there were good numbers of salmon fry at most of the sites surveyed indicating good spawning in 2016; upstream of the headrace, though salmon parr were observed at three of the surveyed sites, no fry were detected. Many of the sites visited in the course of the survey were deemed too narrow and overgrown for salmon and were not surveyed. The Blackwater had a mean catch of 10.74 salmon fry/5min.

Groody - Only two sites visited on the Groody were deemed suitable for the survey. No salmon were detected at either of these sites.

Kilmastula – Excellent results were obtained at a site in the middle reaches of the catchment around Kilmastula Bridge. Fry were also present at the upper end of the catchment around Erinagh Bridge, suggesting unimpeded passage. The Kilmastula had a mean catch of 10.35 salmon fry/5min.

Shannon - Old Main channel – While not ideally suited to surveying larger rivers such as this the method can be used in main channels when substrate, depth and flow conditions allow. Water levels on the main channel were persistently high during the sampling period and only 4 sites were surveyed. Sites surveyed here revealed small numbers of fry, indicating that there is some spawning occurring in the main channel. The proportion of parr observed was higher than observed in the other two Shannon sub-catchments where salmon were found. The old main channel had a mean catch of 5.5 salmon fry/5min.

Table A.5.2.2: Numbers of individuals of various species encountered in 2017 CWEF surveys on Shannon sub-catchments.

IFI River	Salmon	Brown Trout	Crayfish	Dace	European eel	Gudgeon	Lamprey sp.	Minnow	Pike	Stone loach	Three-spined stickleback
Shannon Blackwater	88	24			31	3		2			1
Shannon Groody		17			1					20	5
Shannon Kilmastula	113	65		21	14		10	54		72	1
Shannon Old Main Channel	56	13	1		11	1		20	2	37	10

Table A.5.2.3: Site specific results of CWEF on the Shannon catchments surveyed in 2017.

Site #	Original Site Number	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
Blackwater Sub-catchment									
165	B01	R 61335 59530	4	1	0	19	Include	0.00	25.00
166	B02	R 61567 59985	4	2	1	4	Include	1.40	5.60
167	B03	R 61253 61509	4	1	2	27	Include	2.41	32.59
168	B04	R 60412 61691	4	2	2	20	Include	2.27	22.73
171	B07	R 60026 65846	3	2	4	0	Include	5.00	0.00
173	B09	R 58982 65622	3	1	1	0	Include	1.00	0.00
174	B10	R 58376 65598	3	1	0	0	Include	0.00	0.00
175	B11	R 57705 65443	3	1	2	0	Include	2.00	0.00
169	B05	R 59416 62436	4	0	0	0	Not Sampled		
170	B06	R 59793 63558	4	0	0	0	Not Sampled		
172	B08	R 59370 65548	3	0	0	0	Not Sampled		
176	B12	R 56862 65932	3	2	0	0	Not Sampled		
177	B13	R 56348 65544	2	0	0	0	Not Sampled		
178	B14	R 55141 65288	2	0	0	0	Not Sampled		
179	B15	R 58198 66134	2	0	0	0	Not Sampled		
180	B16	R 57942 66201	1	0	0	0	Not Sampled		
181	B17	R 57564 66296	1	0	0	0	Not Sampled		
182	B18	R 56706 66629	1	0	0	0	Not Sampled		
183	B19	R 56127 66599	4	0	0	0	Not Sampled		
184	B20	R 55870 66733	3	0	0	0	Not Sampled		
Groody Sub-Catchment									
154	G03	R 61604 55107	4	2	2	0	Include	3.00	0.00
155	G04	R 62371 55140	4	2	13	0	Include	16.00	0.00
152	G01	R 60558 57144	4	0	0	0	Not Sampled		
153	G02	R 61275 56050	4	0	0	0	Not Sampled		
156	G05	R 63587 54302	4	0	0	0	Not Sampled		
157	G06	R 63495 53790	3	0	0	0	Not Sampled		
158	G07	R 67744 51661	2	0	0	0	Not Sampled		
159	G08	R 66863 49966	3	0	0	0	Not Sampled		
160	G09	R 66384 48876	3	0	0	0	Not Sampled		
161	G10	R 64018 49426	2	0	0	0	Not Sampled		
162	G11	R 63491 50368	3	0	0	0	Not Sampled		
163	G12	R 64491 51148	1	0	0	0	Not Sampled		
164	G13	R 62629 52773	3	0	0	0	Not Sampled		
Kilmastula Sub-Catchment									
135	K01	R 68031 67843	7	3	2	5	Include	2.57	6.43
136	K02	R 70978 69514	5	2	0	2	Include	0.00	2.00
137	K03	R 72781 69723	4	1	2	14	Include	2.63	18.38
138	K04	R 72953 70020	4	1	8	24	Include	9.50	28.50
139	K05	R 73406 70371	3	1	17	15	Include	21.25	18.75
141	K07	R 74146 70919	2	1	19	0	Include	20.00	0.00
142	K08	R 74605 70638	4	1	6	16	Include	6.82	18.18
143	K09	R 75283 70911	4	1	1	7	Include	1.25	8.75
147	K13	R 81370 72614	4	3	0	1	Include	0.00	1.00
148	K14	R 82818 73405	4	1	1	10	Include	1.18	11.82
151	K17	R 85901 71509	2	1	0	0	Include	0.00	0.00
140	K06	R 73939 71180	2	0	0	0	Not Sampled		
144	K10	R 78150 71646	4	0	0	0	Not Sampled		
145	K11	R 78440 71447	3	0	0	0	Not Sampled		
146	K12	R 78738 72053	4	0	0	0	Not Sampled		
149	K15	R 83982 72464	3	0	0	0	Not Sampled		
150	K16	R 84963 72579	2	0	0	0	Not Sampled		
Old Main Channel / Castleconnell									
185	cc2	R 65617 62495	7	1	6	12	Include	6.00	12.00
187	cc3see2	R 63792 61110	7	1	0	0	Include	0.00	0.00
188	cc4see1	R 63819 61092	7	2	0	3	Include	0.00	5.00
189	cc8	R 64321 61666	7	2	0	5	Include	0.00	5.00
186	cc3	?	7	2	0	0	No Results Recorded		

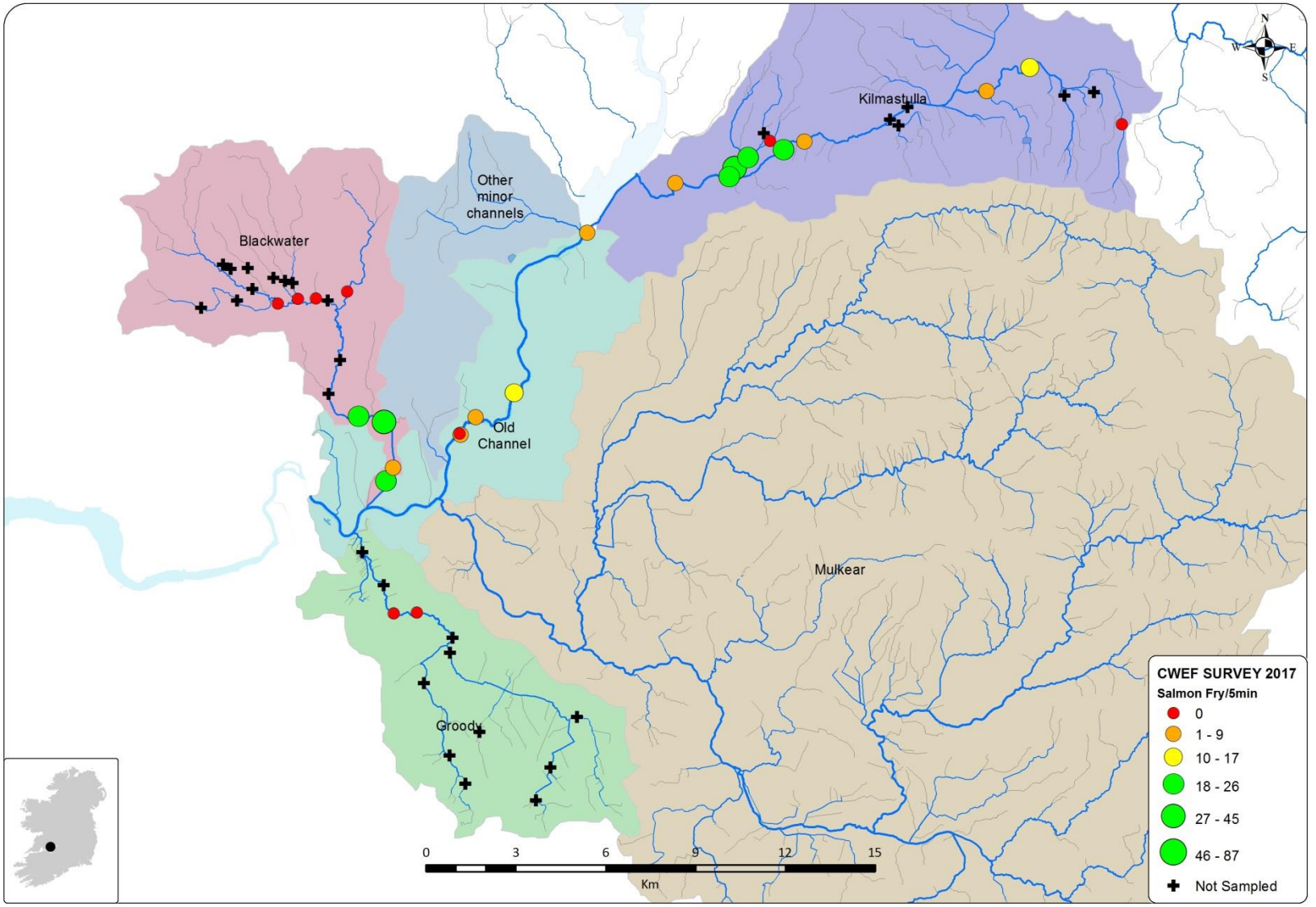
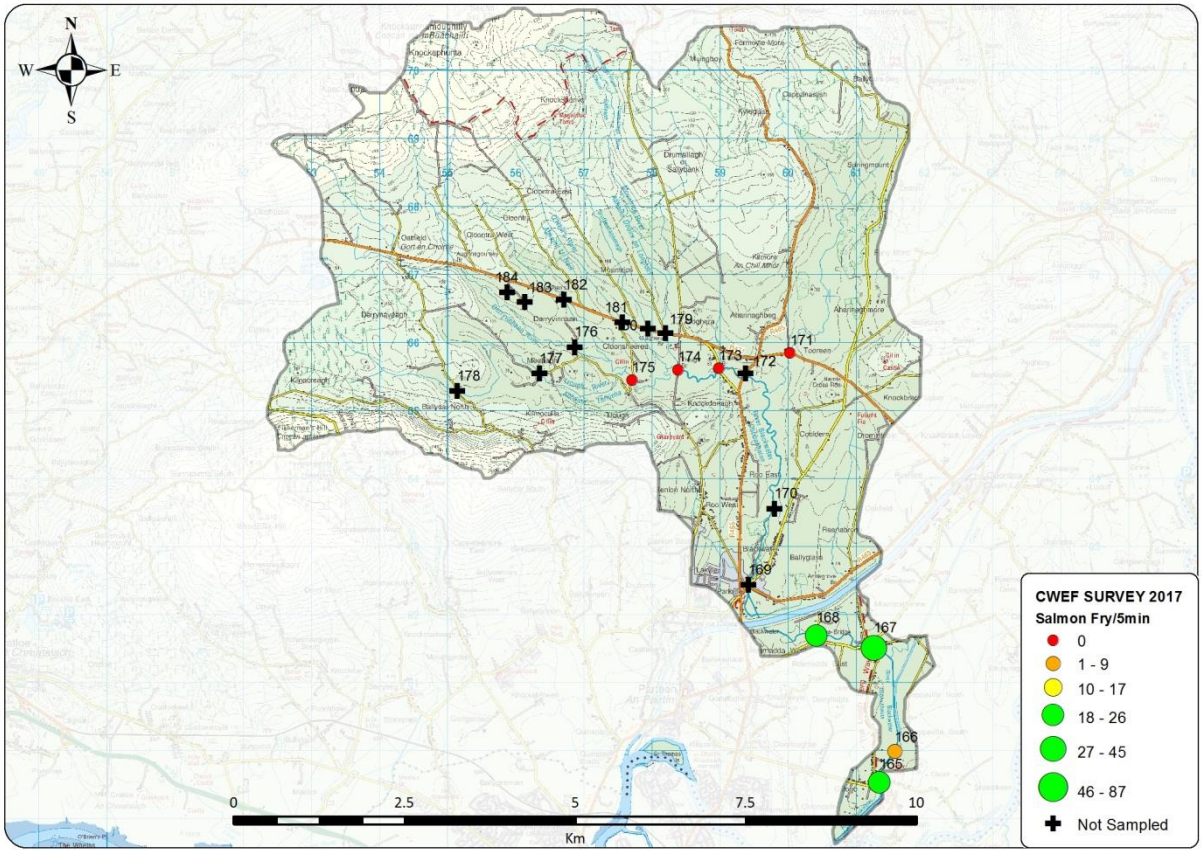
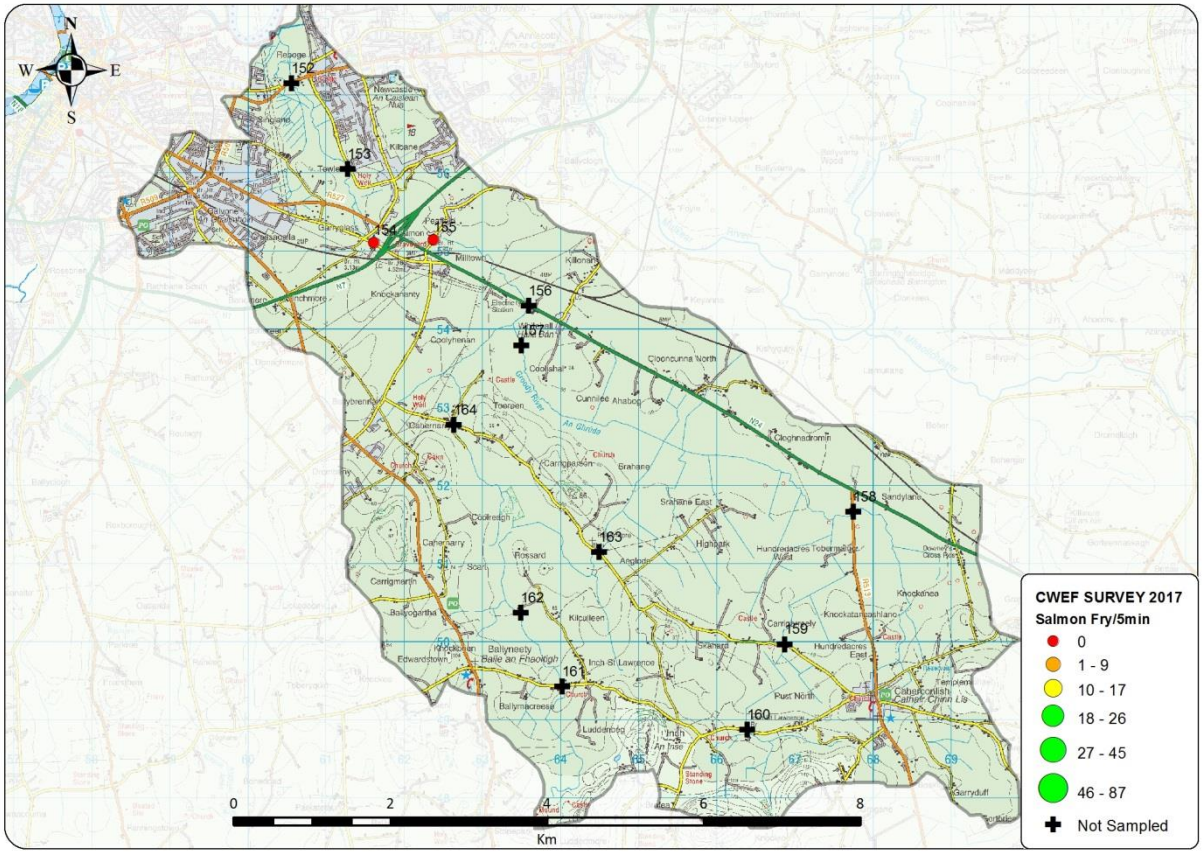


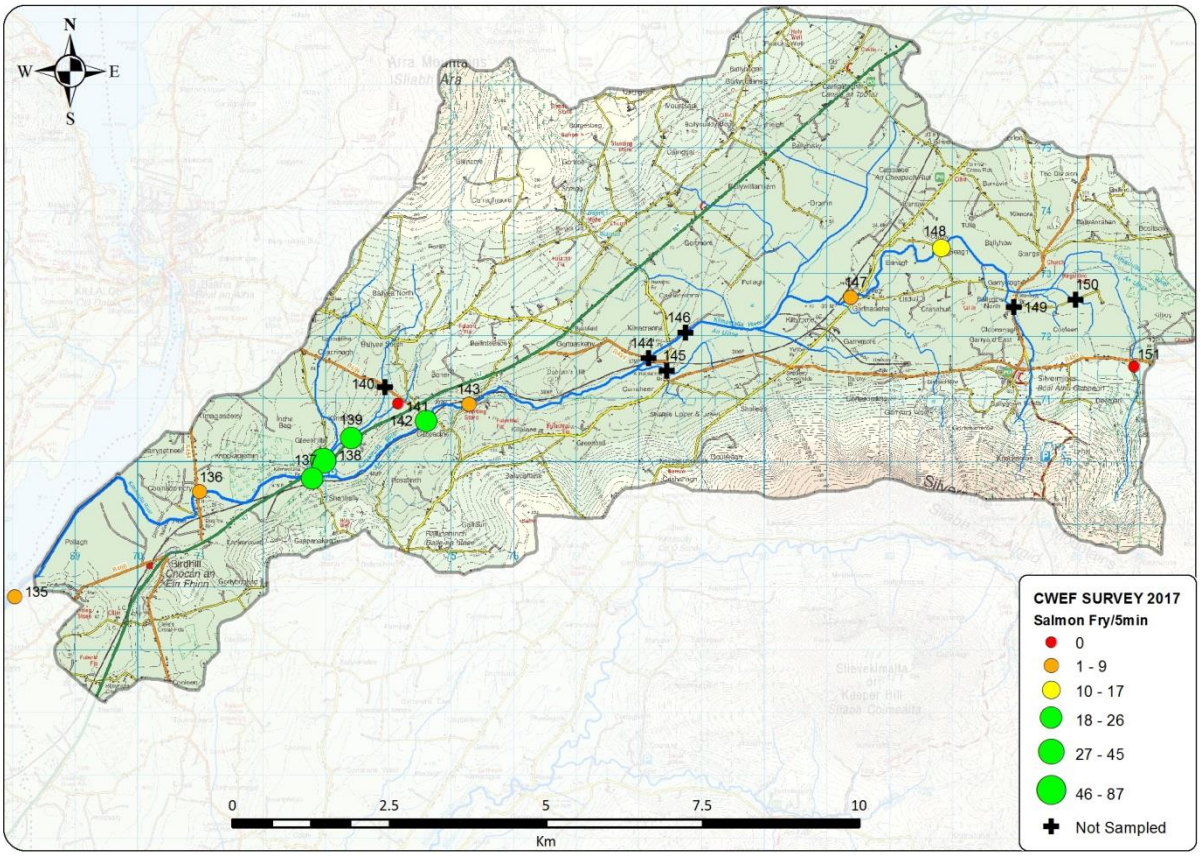
Figure A.5.2.1: Salmon fry abundance by site (no. fry/5min) for Kilmastula, Blackwater and Groody sub-catchments sampled on dates from 19-27 July 2017. Coloured circles indicate abundance; + indicates sites visited but not fished as unsuitable.

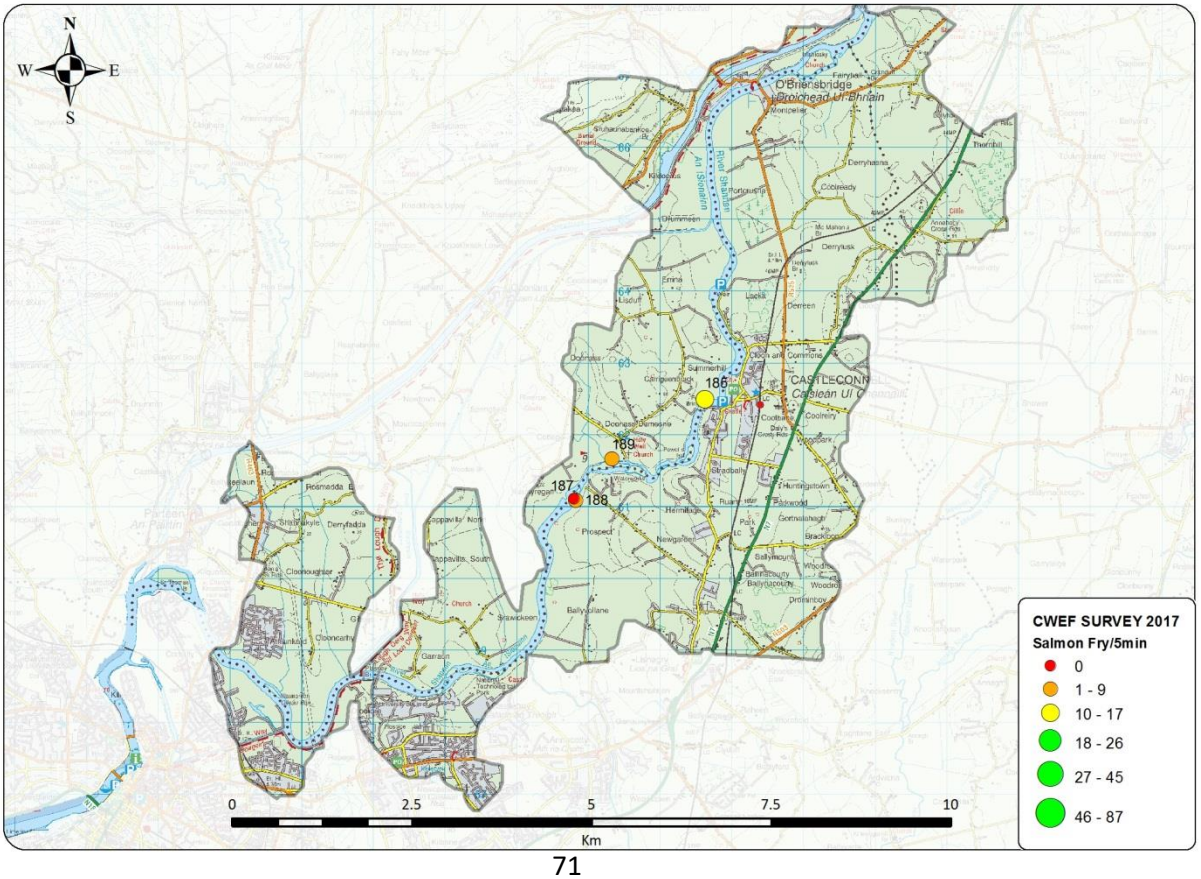
Figures A.5.2.2 & A.5.2.3: Salmon fry abundance by site (no. fry/5min) for the Blackwater (top) and Groody (bottom) sub-catchments sampled on dates in July 2017. Coloured circles indicate abundance; + indicates sites visited but not fished as unsuitable for either salmon or electrofishing.





Figures A.5.2.4 & A.5.2.5: Salmon fry abundance by site (no. fry/5min) in the Kilmastula sub-catchment sampled on dates in July 2017 (top), and the old main channel sampled in Sept 2017(bottom). Coloured circles indicate abundance; + indicates sites visited but not fished as unsuitable for either salmon or electrofishing.





A.5.3. River Doonbeg

IFI Salmon Catchment #:	133
2017 survey dates:	12/7/17 to 18/7/2017
Mean Salmon Fry/5 min (2017):	18.77 fry/5min.
CWEF Index:	16.15 fry/5min.

Sampling carried out by:
David Germaine
Ray Byrne
Ryan Gray

Fish Species Present:

Brown Trout	Salmon
European Eel	3-Spined Stickleback
Founder	

Figure A.5.3.1: Length distribution of salmon captured in 2017 CWEF survey on the Doonbeg Catchment.

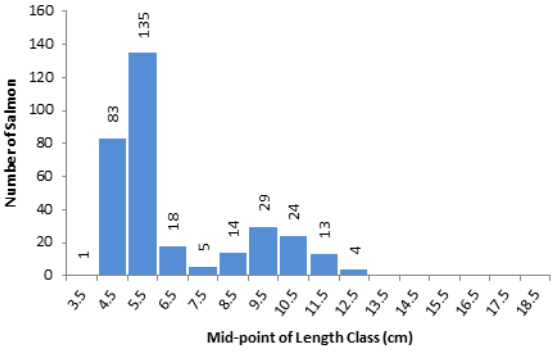


Figure A.5.3.2: Comparison of mean salmon fry/5min for all surveys on the Doonbeg catchment to 2017.

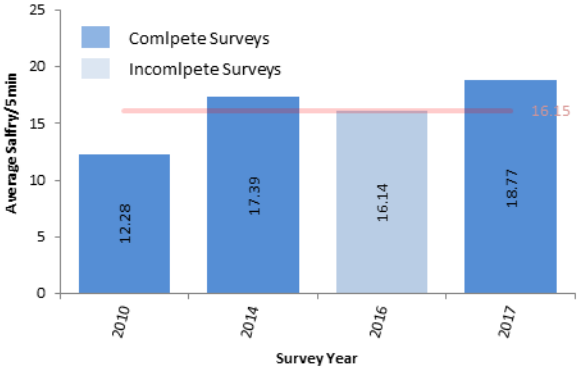


Table A.5.3.1: Conservation limits and provisional returns on the Doonbeg catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	425	-202	Closed							
2008	2009	425	-201	Closed							
2009	2010	425	-201	Closed	15		4	8		2.56	12.28
2010	2011	425	-201	Closed							
2011	2012	425	-201	Closed							
2012	2013	425	-217	Closed							
2013	2014	523	-354	Closed	15	1			5	3.29	17.39
2014	2015	524	-354	Closed							
2015	2016	524	-354	Closed	11		1			5.76	16.14†
2016	2017	524	-354	Closed	15				1	4.32	18.77

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; † = Incomplete Surveys.

This, the fourth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during July 2017. The survey comprised 16 sites, 15 of which were included in the analysis. Salmon fry were present at all but one sites. The maximum fry catch was 38 salmon at site 13. The mean catch of included sites was 18.77 salmon fry/5min. The modal length category of 0+ fry caught was 5.5cm.

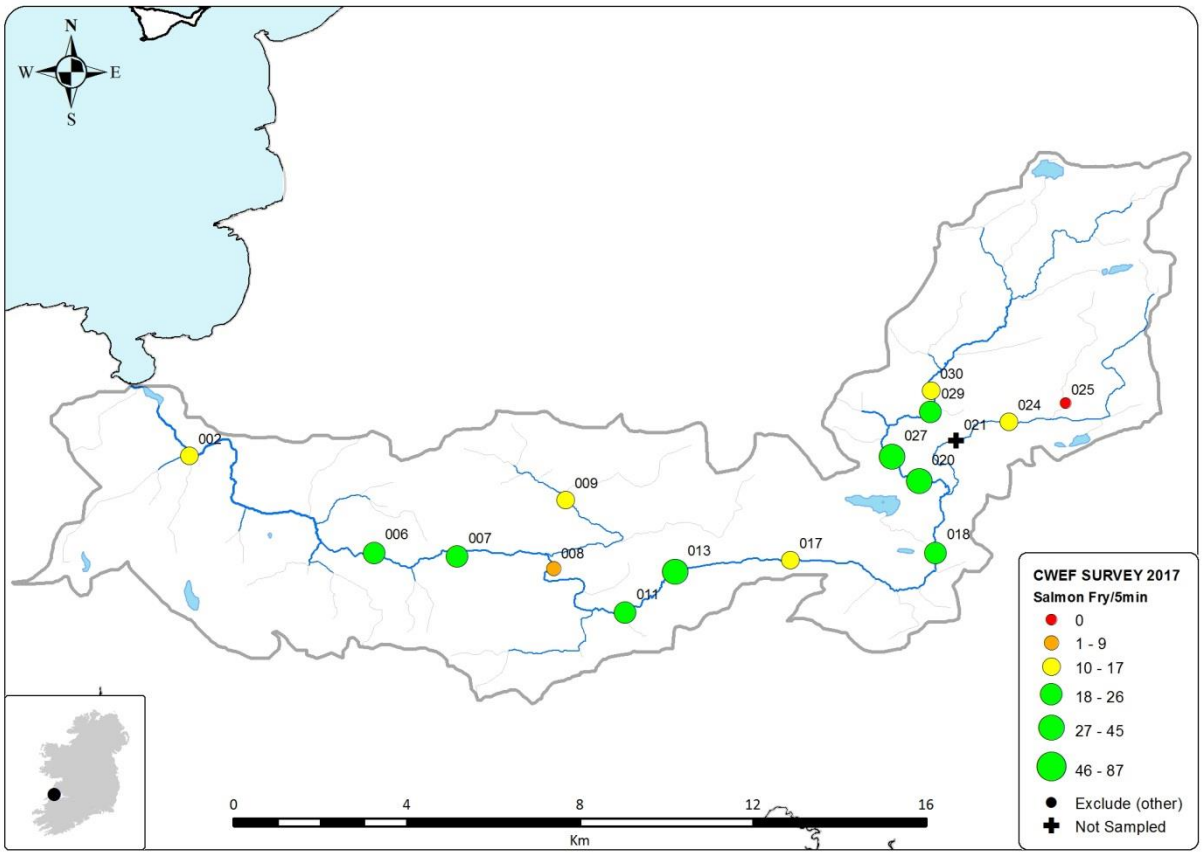
Conclusion

The Doonbeg had a mean catch of 18.77 salmon fry/5min in 2017. Taking the five most recent surveys into account this results in a cumulative average of 16.15 salmon fry/5min which is below the 17 salmon fry threshold. Good numbers of salmon have been observed in this catchment since 2013.

Table A5.3.2: Site specific results of CWEF on the Doonbeg catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
002	Q 97839 64365	4	1	11	10	Include	11.52	10.48
006	R 02114 62116	3	1	1	21	Include	1.18	24.82
007	R 04033 62029	3	1	2	18	Include	2.50	22.50
008	R 06261 61763	3	2	2	5	Include	2.57	6.43
009	R 06535 63351	2	1	5	8	Include	6.15	9.85
011	R 07917 60734	2	1	5	17	Include	6.14	20.86
013	R 09069 61692	2	1	1	38	Include	1.10	41.90
017	R 11732 61955	2	1	5	8	Include	6.54	10.46
018	R 15098 62120	2	1	6	19	Include	7.20	22.80
020	R 14712 63797	3	1	3	28	Include	3.39	31.61
024	R 16791 65153	2	2	20	14	Include	22.94	16.06
025	R 18099 65591	2	2	24	0	Include	26.00	0.00
027	R 14079 64352	3	1	4	26	Include	4.67	30.33
029	R 14974 65376	3	1	11	18	Include	13.28	21.72
030	R 14989 65881	3	2	7	10	Include	8.24	11.76
021	R 15569 64720	2	0	0	0	Not Sampled		

Map A.5.3.1: Showing locations of 2017 survey sites on Doonbeg River.



A.5.4. River Aughyvackeen

IFI Salmon Catchment #: 143
2017 survey dates: 4/7/2017 to 12/7/2017
Mean Salmon Fry/5 min (2017): 1.70 fry/5min.
CWEF Index: 1.35 fry/5min.

Sampling carried out by:
David Germaine
Ray Byrne

Fish Species Present:
Brown Trout
European Eel
Salmon

Figure A.5.4.1: Length distribution of salmon captured in 2017 CWEF survey on the Aughyvackeen Catchment.

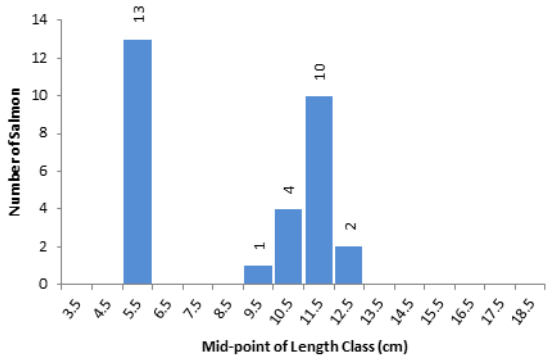


Figure A.5.4.2: Comparison of mean salmon fry/5min for all surveys on the Aughyvackeen catchment to 2017.

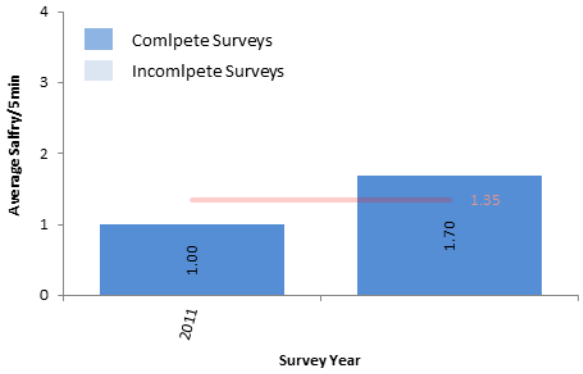


Table A.5.4.1: Conservation limits and provisional returns on the Aughyvackeen catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	225	-110	Closed							
2008	2009	225	-110	Closed							
2009	2010	225	-110	Closed							
2010	2011	225	-110	Closed	5				12	2.05	1.00
2011	2012	225	-110	Closed							
2012	2013	225	-110	Closed							
2013	2014	222	-138	Closed							
2014	2015	222	-137	Closed							
2015	2016	222	-137	Closed							
2016	2017	222	-137	Closed	9				11	1.74	1.70

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the second CWEF survey of this catchment in the 2007 to 2017 period, was carried out during July 2017. The survey comprised 17 sites, 16 of which were included in the analysis. Salmon fry were present at 3 sites. The maximum fry catch was 6 salmon at site 3. The mean catch of included sites was 1.70 salmon fry/5min. The modal length category of 0+ fry caught was 5.5cm. A number of larger, 1+ fry were caught; the modal length of that cohort was 11.5cm.

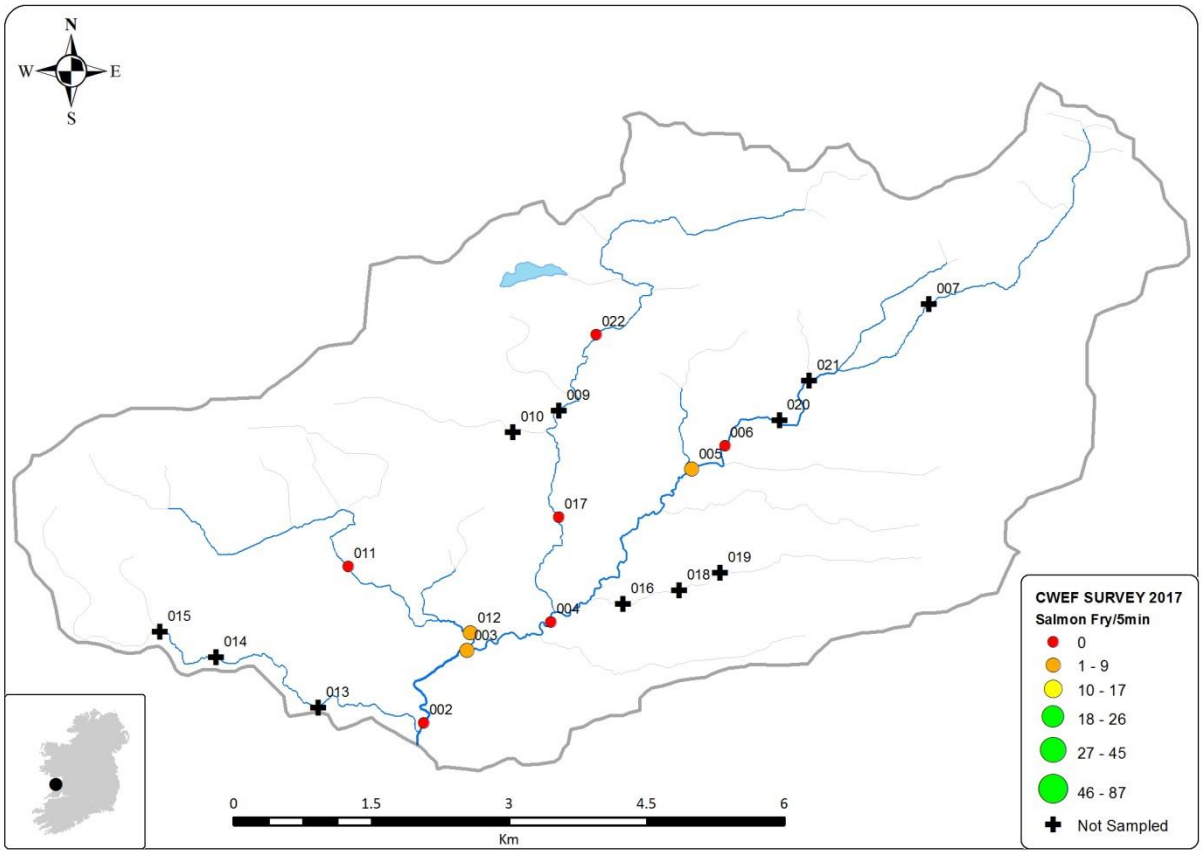
Conclusion

The Aughyvackeen had a mean catch of 1.70 salmon fry/5min in 2017. Taking the two surveys into account this results in a cumulative average of 1.35 salmon fry/5min which is below the 17 salmon fry threshold.

Table A.5.4.2: Site specific results of CWEF on the Aughyvackeen catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
002	R 11555 91146	4	3	0	0	Include	0.00	0.00
003	R 12029 91942	4	1	2	6	Include	2.50	7.50
004	R 12943 92251	3	1	0	0	Include	0.00	0.00
005	R 14479 93921	3	1	8	5	Include	9.23	5.77
006	R 14838 94174	0	2	6	0	Include	8.00	0.00
011	R 10735 92855	2	1	6	0	Include	6.00	0.00
012	R 12064 92134	3	2	2	2	Include	2.00	2.00
017	R 13029 93395	2	3	12	0	Include	15.00	0.00
022	R 13438 95384	2	1	6	0	Include	6.00	0.00
007	R 17063 95720	2	0	0	0	Not Sampled		
009	R 13029 94557	2	0	0	0	Not Sampled		
010	R 12527 94324	1	0	0	0	Not Sampled		
013	R 10406 91314	2	0	0	0	Not Sampled		
014	R 09290 91866	2	0	0	0	Not Sampled		
015	R 08680 92143	2	0	0	0	Not Sampled		
016	R 13728 92446	1	0	0	0	Not Sampled		
018	R 14341 92597	1	0	0	0	Not Sampled		
019	R 14787 92789	1	0	0	0	Not Sampled		
020	R 15433 94453	3	0	0	0	Not Sampled		
021	R 15760 94887	3	0	0	0	Not Sampled		

Map A.5.2.1: Showing locations of 2017 survey sites on Aughyvackeen.



A.6. Western River Basin District.

Summary

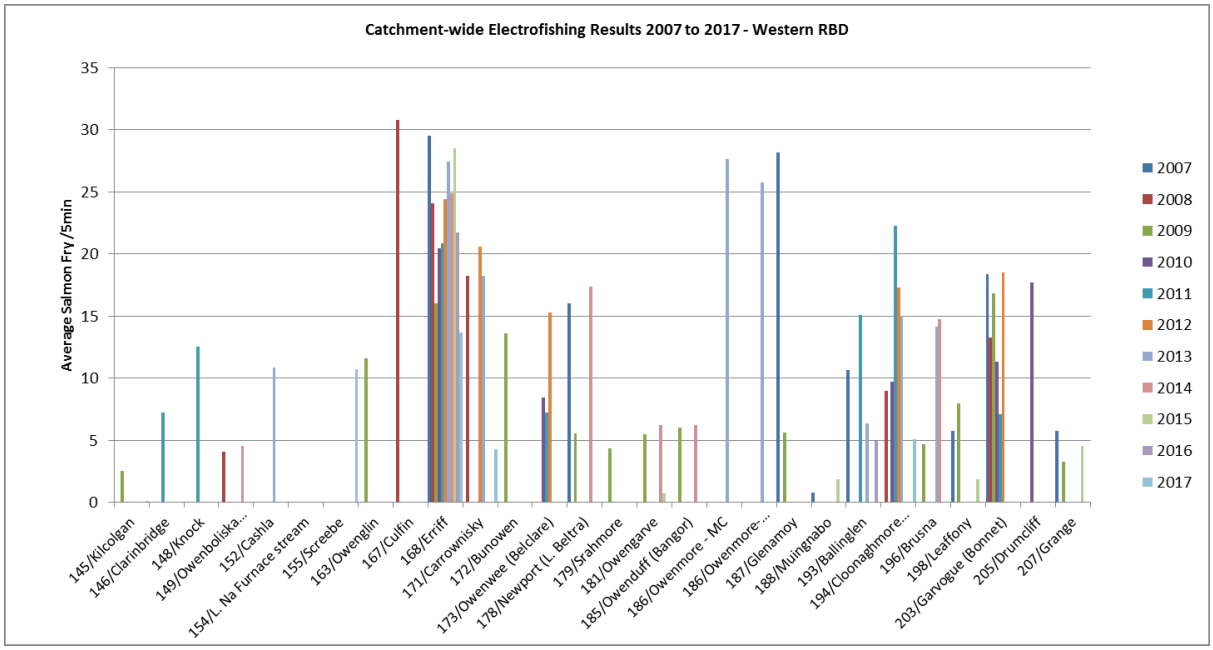
Since 2007, twenty-eighth salmon rivers have been surveyed in the Western River Basin District (WRBD) as part of the on-going catchment-wide electrofishing surveys. These are presented in (Table A.6.1). At present five rivers are meeting the threshold of 17 salmon fry per 5min. In this region in 2017 six CWEF surveys were undertaken. These were conducted on the Kilcolgan, Screebe, Erriff, Bunowen, Clooghnamore, and on the small catchment of Loch an Mhuillin.

Table A.6.1: Catchment-wide Electrofishing data for the Western River Basin District 2007-2017 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

	Survey Year												
Code/River	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Current Index**	**# Annual Surveys Considered**
145/Kilcolgan			2.51									2.51	1
146/Clarinbridge					7.26							7.26	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
155/Screeb											10.70	10.70	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	21.72	13.69	23.26	5
171/Carrownisky		18.25				20.60	18.22				4.25†	19.02	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					17.40				13.00	3
179/Srahmore			4.33									4.33	1
181/Owengarve			5.51					6.19	0.72			4.14	3
185/Aughyvackeen (Bangor)			6.00					6.20				6.10	2
186/Owenmore - MC							27.65					27.65	1
186/Owenmore-Carrowmore							25.77					25.77	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			4.97		9.27	4
194/Cloonaghmore (Palmerstown)		8.96		9.71	22.27	17.32	15.02				5.07†	14.66	5
196/Brusna			4.70				14.16	14.74				11.20	3
198/Leaffony	5.76		7.95						1.87			5.19	3
203/Garvogue (Bonnet)	18.41	13.26	16.83	11.31	7.08	18.54						13.40	5
205/Drumcliff				17.72								17.72	1
207/Grange	5.75		3.29						4.56			4.53	3
1551/Loch An Mhuillin											0.00	0.00	1

Bold annual figures indicate years included in calculation of current CWEF index.
Underlined index figures indicate those exceeding the 17 salmon fry threshold.
† Incomplete surveys not included in calculation of current index.

Figure A.6.1: Summary of CWEF results in Western River basin district 2007-2017.



A.6.1. River Screeb

IFI Salmon Catchment #:	155
2017 survey dates:	7/7/2017 to 19/7/1007
Mean Salmon Fry/5 min (2017):	10.70fry/5min.
CWEF Index:	10.70 fry/5min.

Sampling carried out by:	**Fish Species Present:**	
Kevin Kerrigan	Brown Trout	Minnow
Paddy Gargan	European Eel	Salmon

Figure A.6.1.1: Length distribution of salmon captured in 2017 CWEF survey on the Screeb Catchment.

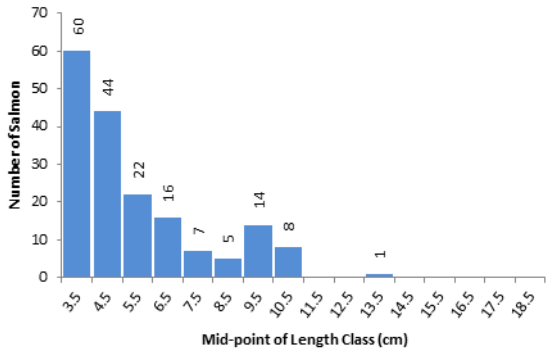


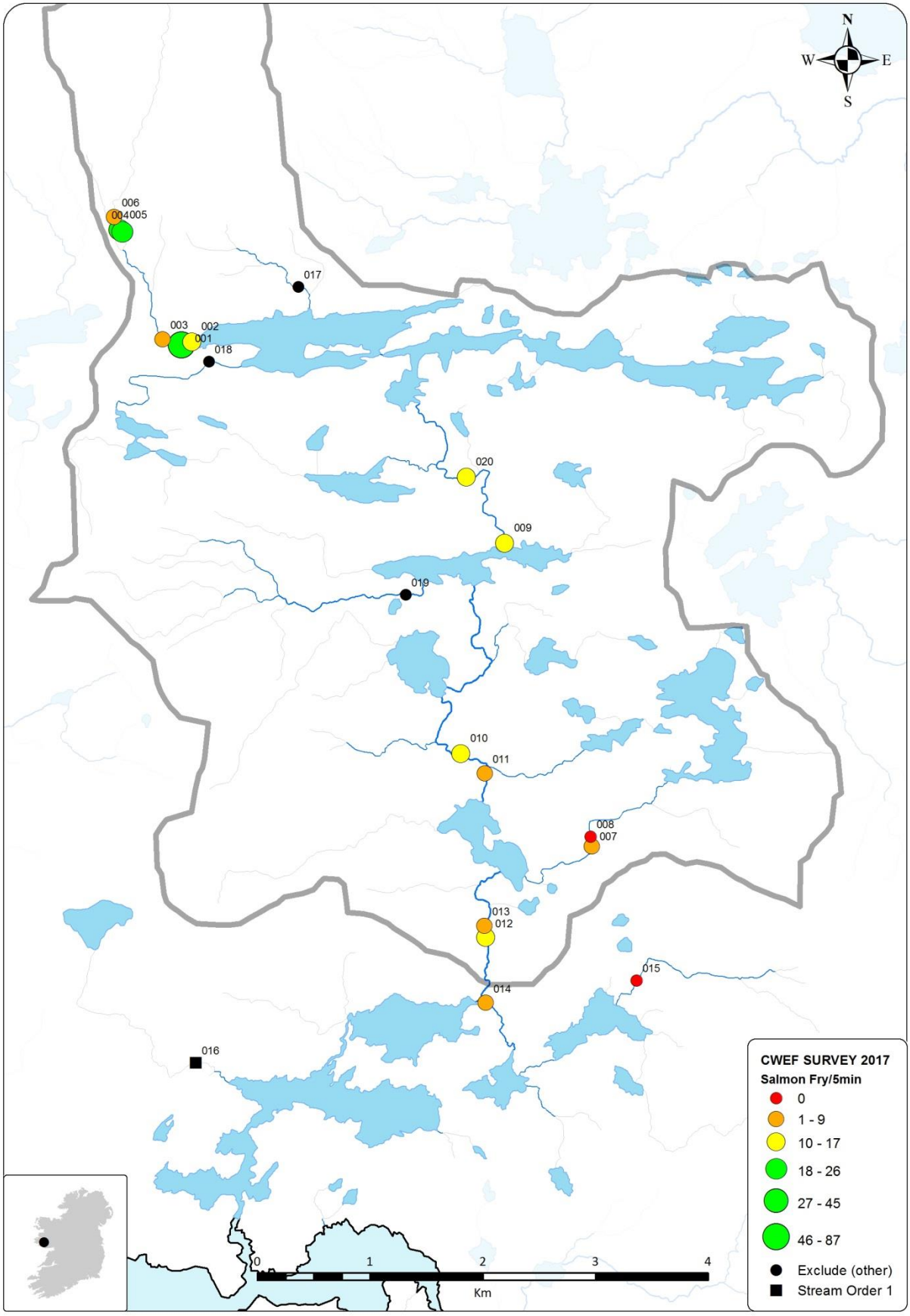
Table A.6.1.1: Conservation limits and provisional returns on the Screeb catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	155	263	Catch Release							
2008	2009	154	215	Catch Release							
2009	2010	154	174	Catch Release							
2010	2011	154	113	Catch Release							
2011	2012	154	-14	Catch Release							
2012	2013	154	-23	Catch Release							
2013	2014	155	-33	Catch Release							
2014	2015	150	57	Open							
2015	2016	150	60	Open							
2016	2017	150	26	Open	16			4		0.95	10.70

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the first CWEF survey of this catchment in the 2007 to 2017 period, was carried out during July 2017. The survey comprised 20 sites, 16 of which were included in the analysis. Salmon were observed at all the sites surveyed on the main channel; highest numbers were found at the top of the catchment above Lough Shindilla. The maximum fry catch was 46 salmon at site 1. The mean catch of included sites was 10.70 salmon fry/5min. The modal length category of 0+ fry caught was 3.5cm.

Map A.6.1.1: Showing locations of 2017 survey sites on the Screeb River.



Conclusion

The Screeb had a mean catch of 10.7 salmon fry/5min in 2017. As this is the only survey on this catchment to date this results in a cumulative average of 10.7 salmon fry/5min, which is below the 15 salmon fry threshold.

Table A.6.1.2: Site specific results of CWEF on the Screeb catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	L 94626 46000	2	1	3	46	Include	3.31	50.69
002	L 94718 46025	2	2	1	10	Include	1.18	11.82
003	L 94458 46051	2	3	2	7	Include	2.00	7.00
004	L 94100 47001	2	3	3	15	Include	4.00	20.00
005	L 94072 47023	2	3	2	19	Include	2.29	21.71
006	L 94028 47136	2	3	6	6	Include	7.50	7.50
007	L 98267 41548	2	2	23	2	Include	26.68	2.32
008	L 98256 41632	2	3	11	0	Include	13.00	0.00
009	L 97494 44238	3	3	3	8	Include	3.82	10.18
010	L 97106 42369	4	3	2	8	Include	2.60	10.40
011	L 97317 42197	4	3	1	2	Include	1.00	2.00
012	L 97327 40738	4	2	4	9	Include	5.23	11.77
013	L 97314 40844	4	2	8	1	Include	10.67	1.33
014	L 97325 40159	3	2	1	1	Include	1.00	1.00
015	L 98666 40355	2	3	5	0	Include	7.00	0.00
020	L 97156 44827	3	2	7	11	Include	8.56	13.44
016	L 94754 39626	1	3	4	0	Stream Order<2		
017	L 95663 46516	2	3	3	0	Too Narrow		
018	L 94871 45850	2	2	18	0	Too Narrow		
019	L 96615 43780	3	3	2	0	Not Salmon Stream		

A.6.2. River Erriff

IFI Salmon Catchment #: 168
2017 survey dates: 30/8/17 to 25/09/2017
Mean Salmon Fry/5 min (2017): 13.69fry/5min.
CWEF Index: 22.88 fry/5min.

Sampling carried out by:
Barry Kelly
Darren Craig
Donovan Brinklow
Laura Walsh
Paddy Gargan

Fish Species Present:
Brown Trout
Minnow
Salmon
3-Spined Stickleback

Figure A.6.2.1: Length distribution of salmon captured in 2017 CWEF survey on the Erriff Catchment.

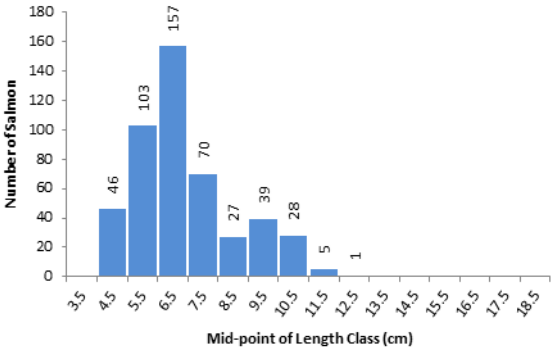


Figure A.6.2.2: Comparison of mean salmon fry/5min for all surveys on the Erriff catchment to 2017.

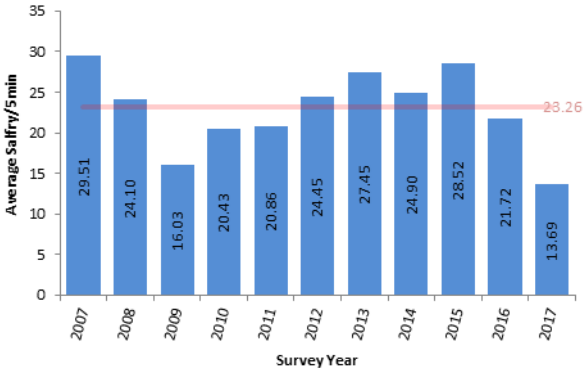


Table A.6.2.1: Conservation limits and provisional returns on the Erriff catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2006	2007			Open	44	5	2	2		2.68	29.51
2007	2008	1299	1620	Open	46		1	2		2.89	24.10
2008	2009	1299	2345	Open	33	16	2	2		2.68	16.03
2009	2010	1299	715	Open	46	2	2	1		2.78	20.43
2010	2011	1299	512	Open	32		1	1	1	4.05	20.86
2011	2012	1299	605	Open	33		1	1		4.05	24.45
2012	2013	1299	592	Open	33		1			4.17	27.45
2013	2014	1382	520	Open	34		1			4.05	24.90
2014	2015	1382	669	Open	35		1	1		3.83	28.52
2015	2016	1382	806	Open	33					4.30	21.72
2016	2017	1382	574	Open	33					4.30	13.69

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the eleventh CWEF survey of this catchment in the 2007 to 2017 period, was carried out during August and September 2017. The survey comprised 33 sites, all of which were included in the analysis. Salmon fry were absent from just two sites. The maximum fry catch was 28 salmon at site 10. The mean catch of included sites was 13.69 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

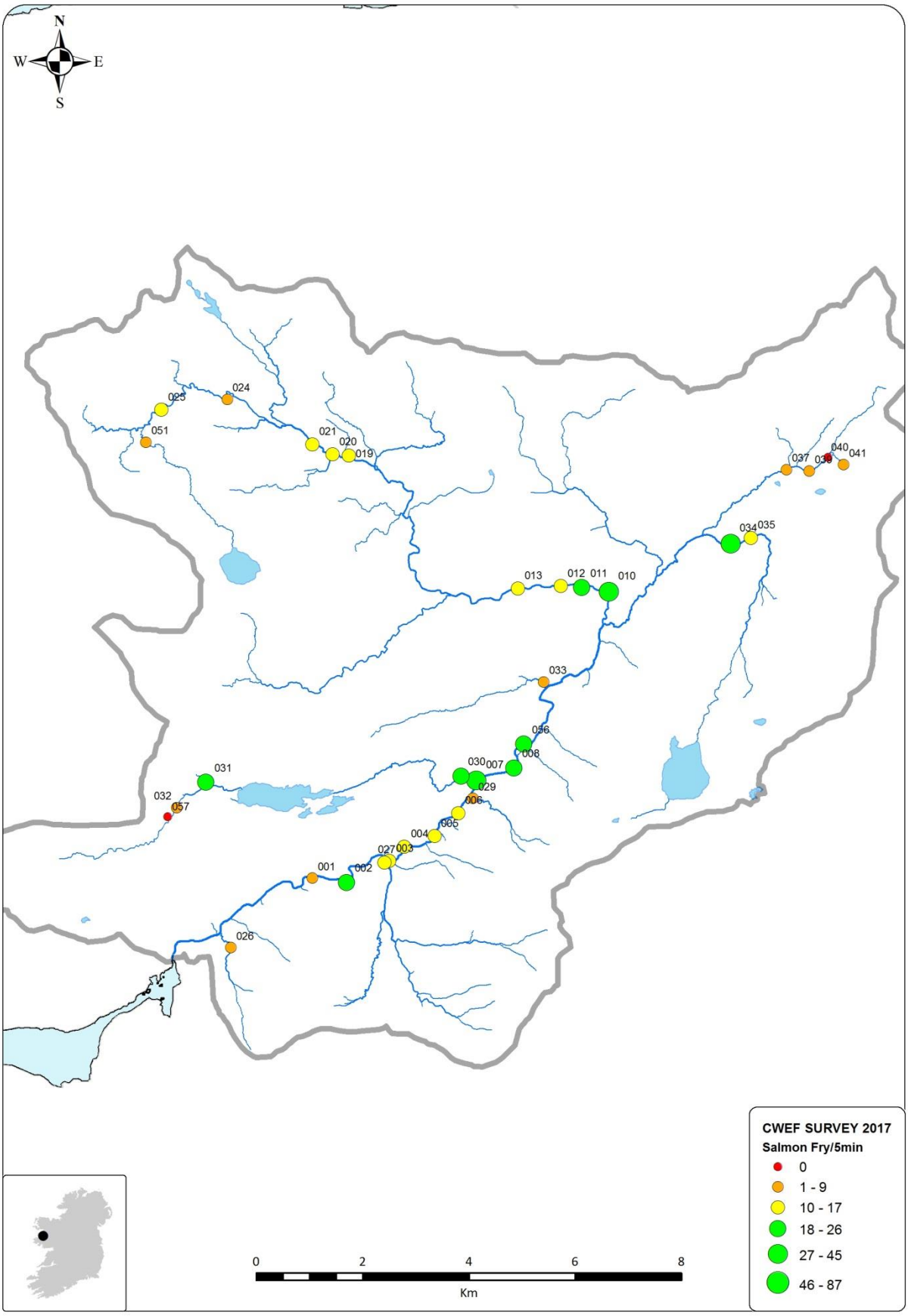
Conclusion

The Erriff had a mean catch of 13.69 salmon fry/5min in 2017. Taking the five most recent surveys into account this results in a cumulative average of 22.88 salmon fry/5min which is above the 17 salmon fry threshold. The result in 2017 is the lowest obtained so far. The numbers this year are considerably lower than those caught in each of the previous years of the survey.

Table A.6.2.2: Site specific results of CWEF on the Erriff catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	L 92056 65797	5	1	0	7	Include	0.00	8.00
002	L 92702 65721	5	1	0	21	Include	0.00	21.00
003	L 93503 66122	5	1	0	12	Include	0.00	16.00
004	L 93784 66390	5	1	0	8	Include	0.00	10.00
005	L 94352 66589	5	0	0	12	Include	0.00	15.00
006	L 94798 67019	5	1	0	10	Include	0.00	13.00
007	L 95142 67641	5	1	0	24	Include	0.00	28.00
008	L 95846 67875	5	1	0	16	Include	0.00	19.00
010	L 97630 71190	4	0	0	28	Include	0.00	30.00
011	L 97125 71269	4	1	0	14	Include	0.00	18.00
012	L 96732 71295	4	1	0	13	Include	0.00	16.00
013	L 95919 71252	4	1	1	13	Include	1.29	16.71
019	L 92739 73748	4	1	1	9	Include	1.30	11.70
020	L 92438 73774	4	2	0	12	Include	0.00	13.00
021	L 92057 73962	4	2	0	13	Include	0.00	17.00
024	L 90454 74809	3	0	5	2	Include	6.43	2.57
025	L 89216 74612	3	0	0	9	Include	0.00	11.00
026	L 90525 64492	3	2	7	3	Include	7.70	3.30
027	L 93408 66092	4	1	0	10	Include	0.00	12.00
029	L 95076 67299	3	0	1	6	Include	1.29	7.71
030	L 94855 67725	3	1	0	22	Include	0.00	25.00
031	L 90058 67605	3	2	5	20	Include	5.80	23.20
032	L 89506 67128	2	0	3	3	Include	3.50	3.50
033	L 96407 69493	3	2	2	7	Include	2.22	7.78
034	L 99926 72098	4	1	0	28	Include	0.00	38.00
035	M 00301 72204	4	1	0	11	Include	0.00	14.00
037	M 00973 73488	3	2	5	2	Include	6.43	2.57
039	M 01401 73456	3	2	0	4	Include	0.00	5.00
040	M 01753 73717	3	2	0	0	Include	0.00	0.00
041	M 02046 73578	2	2	0	8	Include	0.00	9.00
051	L 88924 74002	2	1	0	7	Include	0.00	9.00
056	L 96034 68324	5	2	1	23	Include	1.13	25.88
057	L 89337 66953	2	0	5	0	Include	5.00	0.00

Map A.6.2.1: Showing locations of 2017 survey sites on Erriff River.



A.6.3. River Carrownisky

IFI Salmon Catchment #: 171
2017 survey dates: 26/9/2017
Mean Salmon Fry/5 min (2017): - fry/5min.
CWEF Index: 19.02 fry/5min.

Sampling carried out by:
Donovan Brinklow
Laura Walsh

Fish Species Present:
Brown Trout Salmon
European Eel

Figure A.6.3.1: Length distribution of salmon captured in 2017 CWEF survey on the Carrownisky Catchment.

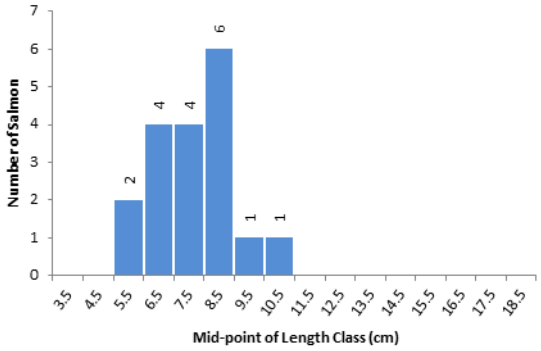


Figure A.6.3.2: Comparison of mean salmon fry/5min for all surveys on the Carrownisky catchment to 2017.

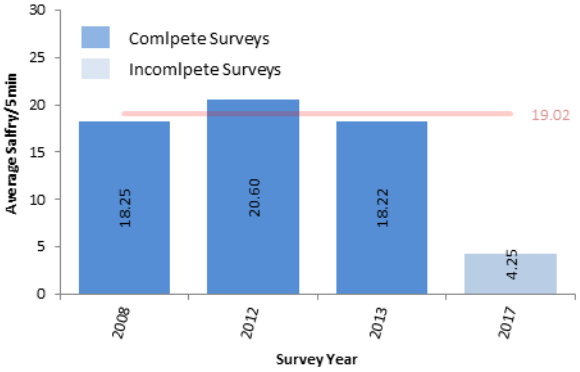


Table A.6.3.1: Conservation limits and provisional returns on the Carrownisky catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	365	-259	Catch Release	16	3	1			2.08	18.25
2008	2009	365	-76	Catch Release							
2009	2010	365	-57	Catch Release							
2010	2011	365	-134	Catch Release							
2011	2012	365	-126	Catch Release	19					2.19	20.60
2012	2013	365	-139	Catch Release	17					2.45	18.22
2013	2014	365	-285	Catch Release							
2014	2015	365	-71	Catch Release							
2015	2016	365	-97	Catch Release							
2016	2017	365	-128	Catch Release	4					10.42	4.25*

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; * Incomplete surveys.

This, the fourth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey was severely curtailed by high water conditions and comprised just 4 sites. Salmon fry were present at three sites. The maximum fry catch was 6 salmon at site 19. The mean catch of included sites was 4.25 salmon fry/5min. When compared with previous results from the same four sites (Table A.6.4.3) it can be seen that result in 2017 falls within the range of previous results.

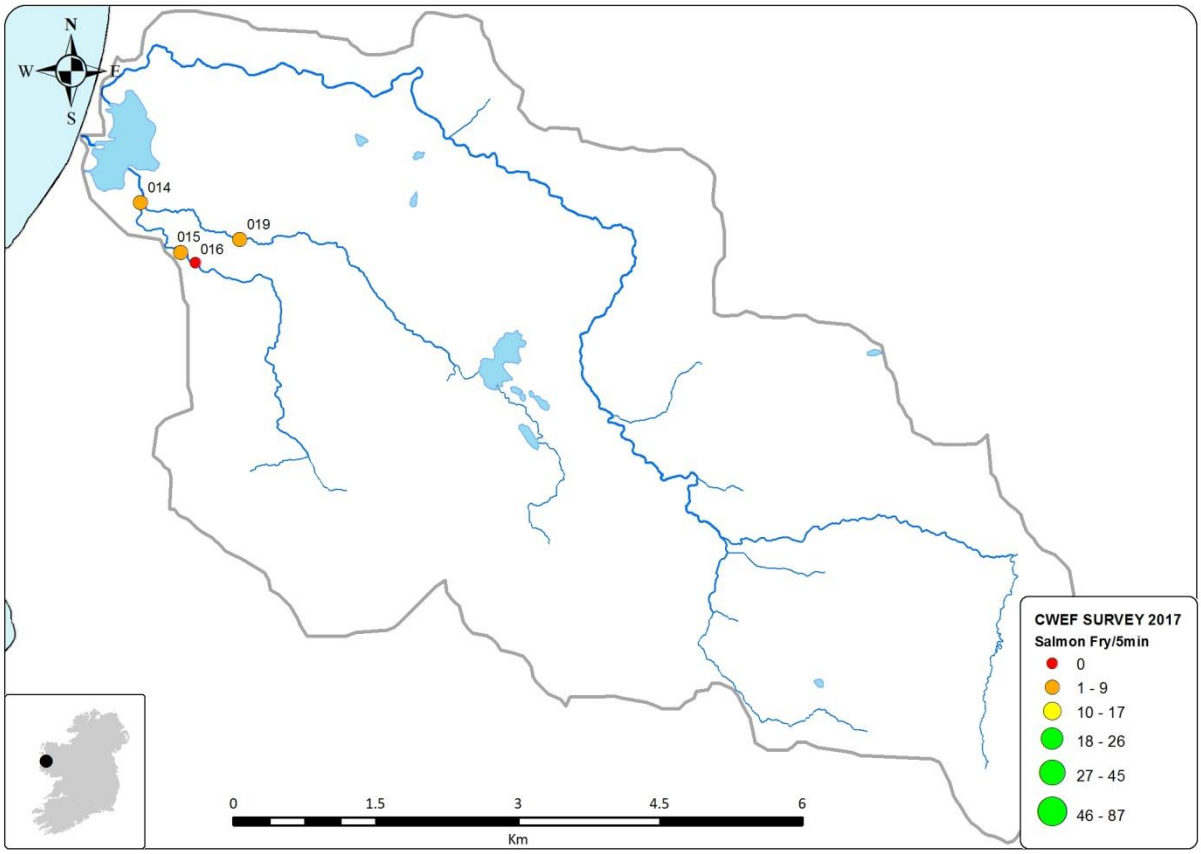
Table A.6.3.2: Site specific results of CWEF on the Carrownisky catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
014	L 75384 75943	3	2	1	5	Include	1.00	5.00
015	L 75809 75421	3	2	7	4	Include	7.00	4.00
016	L 75962 75308	3	3	10	0	Include	14.00	0.00
019	L 76433 75554	3	1	0	6	Include	0.00	8.00

Table A.6.3.3: Previous and current results of Salmon fry per 5min from sites surveyed in 2017 on the Carrownisky catchment.

	Survey Year				
Site #	2008	2012	2013	2017	Total
014	14.00	7.33	1.07	5.00	14
015	4.53	16.67	5.67	4.00	16.67
016	7.00	8.84	2.40	0.00	8.84
019	14.18	14.53	3.23	8.00	14.53
Mean	9.93	11.84	3.09	4.25	13.51
SD	4.91	4.47	1.93	3.30	3.32

Map A.6.3.1: Showing locations of 2017 survey sites on the Carrownisky River.



A.6.4. River Clooghnamore

IFI Salmon Catchment #: 194
2017 survey dates: 5/9/2017 to 23/9/2017
Mean Salmon Fry/5 min (2017): 5.07 fry/5min.
CWEF Index: 14.66 fry/5min.

Sampling carried out by:
Brian Flannery
Declan Doherty
Geoffrey Thornton
John Bourke

Fish Species Present:
Brown Trout
European Eel
Lamprey
Minnow
Salmon
3-Spined Stickleback

Figure A.6.4.1: Length distribution of salmon captured in 2017 CWEF survey on the Clooghnamore Catchment.

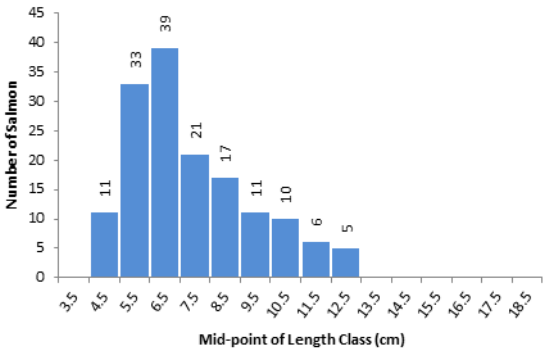


Figure A.6.4.2: Comparison of mean salmon fry/5min for all surveys on the Clooghnamore catchment to 2017.

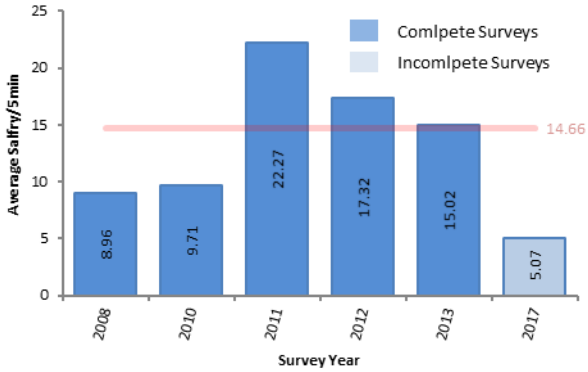


Table A.6.4.1: Conservation limits and provisional returns on the Clooghnamore catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	1260	-752	Closed	40	1	1			2.87	8.96
2008	2009	1260	-753	Closed							
2009	2010	1260	-756	Closed	33		1			3.55	9.71
2010	2011	1260	-785	Closed	27	2			13	2.87	22.27
2011	2012	1260	-785	Closed	33					3.65	17.32
2012	2013	1260	-795	Closed	28	1				4.16	15.02
2013	2014	1324	-1099	Closed							
2014	2015	1323	-1098	Closed							
2015	2016	1323	-1098	Closed							
2016	2017	1323	-1098	Catch Release	28	1				4.16	5.07

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the sixth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 29 sites, 28 of which were included in the analysis. Salmon fry were present at 20 sites. The maximum fry catch was 25 salmon at site 80. The mean catch of included sites was 5.07 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm. Water levels throughout the survey were quite high and the results were depressed.

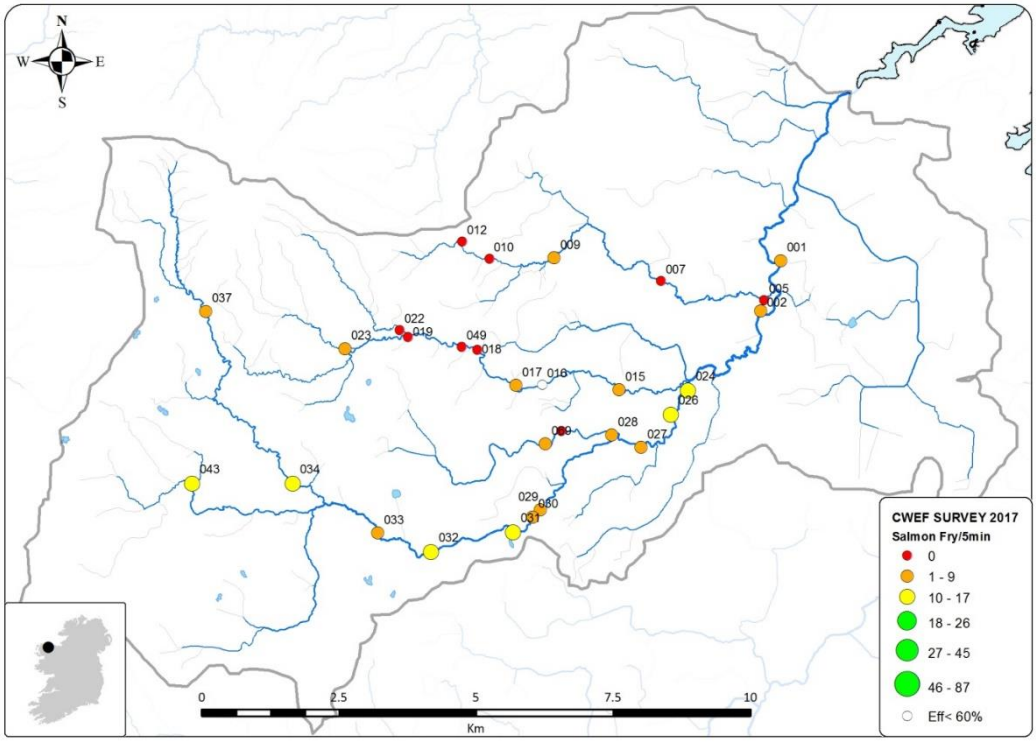
Conclusion

The Clooghnamore had a mean catch of 5.07 salmon fry/5min in 2017. However due to high water levels the results were not used in the calculation of the CEWF average and the mean remains at 14.66 salmon fry/5min which is below the 17 salmon fry threshold.

Table A.3.4.3: Site specific results of CWEF on the Cloonaghmore catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	G 16050 28403	5	1	0	3	Include	0.00	3.00
002	G 15680 27490	5	1	0	5	Include	0.00	7.00
005	G 15747 27691	3	2	1	0	Include	3.00	0.00
007	G 13868 28036	3	20	0	0	Include	0.00	0.00
009	G 11910 28454	3	1	1	1	Include	1.50	1.50
010	G 10732 28438	2	1	0	0	Include	0.00	0.00
012	G 10240 28748	2	2	0	0	Include	0.00	0.00
015	G 13098 26063	3	2	4	5	Include	5.78	7.22
017	G 11216 26144	3	2	0	9	Include	0.00	9.00
018	G 10509 26788	3	2	6	0	Include	6.00	0.00
019	G 09245 27017	3	2	12	0	Include	12.00	0.00
022	G 09100 27149	2	2	12	0	Include	16.00	0.00
023	G 08100 26808	2	1	9	3	Include	11.25	3.75
024	G 14353 26050	4	1	0	8	Include	0.00	10.00
026	G 14045 25612	4	2	1	12	Include	1.15	13.85
027	G 13497 25020	4	1	1	5	Include	1.50	7.50
028	G 12967 25245	3	1	0	5	Include	0.00	7.00
029	G 11659 23888	4	1	4	6	Include	5.20	7.80
030	G 11516 23758	4	2	1	4	Include	1.00	4.00
031	G 11165 23485	4	1	2	9	Include	2.91	13.09
032	G 09669 23122	4	1	3	9	Include	4.00	12.00
033	G 08693 23472	4	2	5	1	Include	7.50	1.50
034	G 07140 24360	3	1	2	10	Include	2.83	14.17
037	G 05556 27487	3	2	1	2	Include	1.00	2.00
039	G 12047 25320	3	1	5	0	Include	13.00	0.00
043	G 05310 24362	2	1	3	9	Include	4.25	12.75
049	G 10226 26840	3	1	10	0	Include	16.00	0.00
069	G 11755 25083	3	2	5	4	Include	6.11	4.89
016	G 11699 26154	3	2	3	1	Eff <60%		

Map A.6.4.1: Showing locations of 2017 survey sites on the Clooghnamore River.



A.7.North Western River Basin District.

Summary

Since 2007, thirty-one salmon 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.7.1). At present eight rivers are meeting the threshold of 17 salmon fry per 5min. In this region in 2017 CWEF surveys were undertaken in the Duff, Erne, Oily, Lackagh, Leannan and Clonmany catchments.

Table A.7.1: Catchment-wide Electrofishing data for the North Western River Basin District 2007-2017 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

	Survey Year												
Code/River	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Current Index**	**# Annual Surveys Considered**
208/Duff	**7.84**	**9.31**	**18.59**	**25.16**							**18.05**	15.79	5
210/Erne		7.37	0.17	0.08	0.00	0.00	**0.00**	**1.60**	**1.16**	**1.25**	**0.00**	0.80	5
211/Abbey							**7.20**	**28.14**				17.67	2
212/Ballintra			**10.27**				**13.40**	**18.30**				13.99	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**			**21.26**	20.26	4
217/Bungosteen					**27.91**		**19.23**				**13.17**	20.10	3
219/Glen (Ballyshannon)				**19.44**					**18.37**			18.91	2
220/Owenwee (Yellow R)	**24.13**	**5.00**	**14.81**			**20.31**	**19.65**					16.78	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**							13.66	2
229/Clady		**16.12**				**37.21**						26.67	2
234/Glenna			**16.80**		**3.77**		**7.77**			**4.00**		8.09	4
235/Tullaghobegly		**8.33**		**9.05**						**0.00†**		8.69	2
236/Ray		**6.43**			**14.89**			**17.31**		**3.71†**		12.88	4
240/Lackagh		18.86	**15.82**		**19.20**	**23.57**				**17.50**	**22.50**	19.99	5
248/Leannan	9.47	7.41	8.73	16.71	12.36	**21.51**	**19.51**	**20.87**	**15.27**	15.05†	**18.66**	16.70	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**								5.34	2
252/Mill (Letterkenny)				**0.00**					**0.00**			0.00	2
253/Crana			**15.74**							6.00†	5.78†	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**			2.47	2
259/Glennagannon			**16.65**		**4.05**		**7.13**					9.28	3
261/Culoort				**4.03**					**0.00**			2.02	2

Bold annual figures indicate years included in calculation of current CWEF index.
Underlined index figures indicate those exceeding the 17 salmon fry threshold.
† Incomplete surveys not included in calculation of current index.

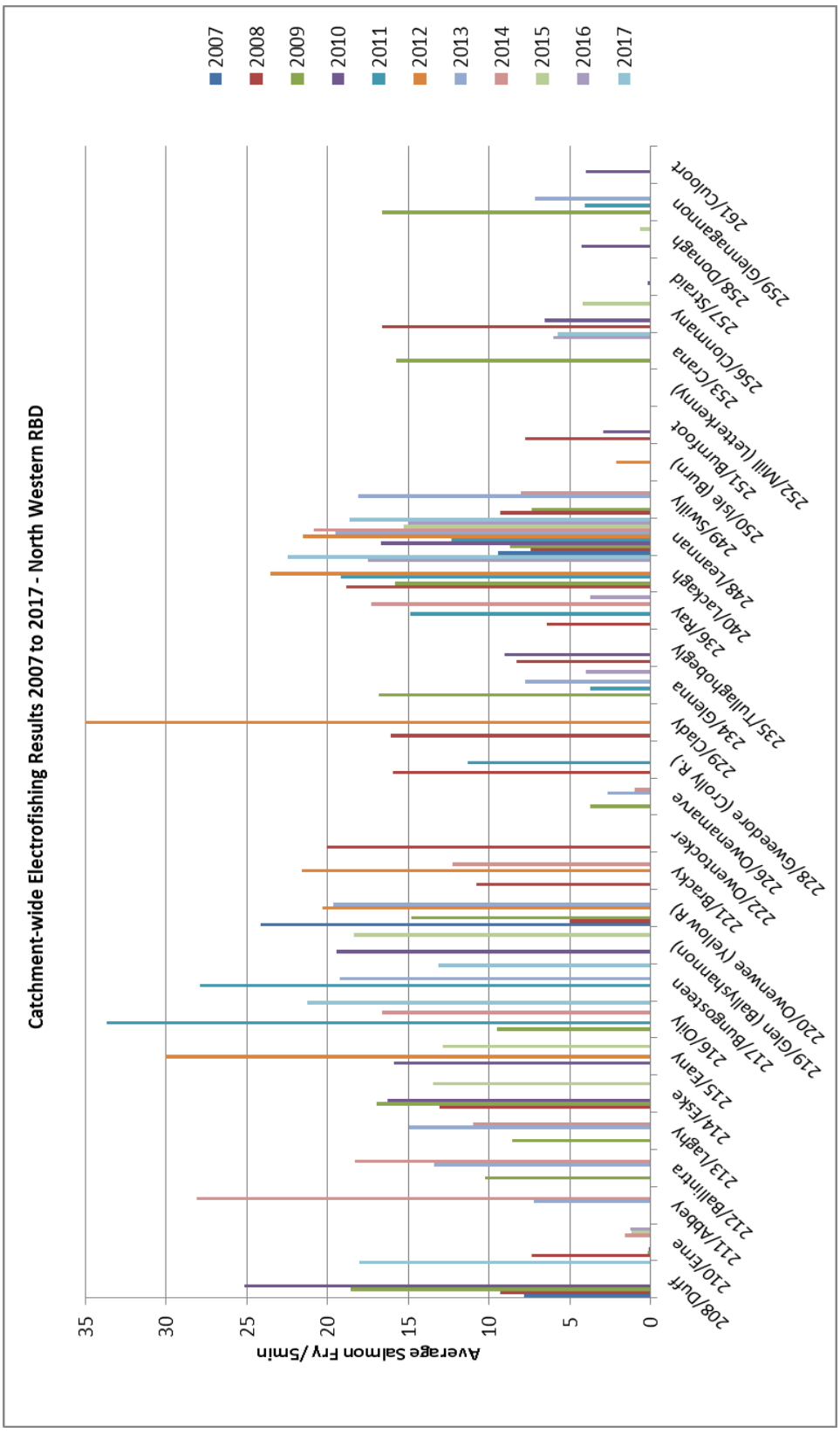


Figure A.7.1: Summary of CWEF results in North Western River basin district 2007-2017.

A.7.1. River Duff

IFI Salmon Catchment #: 208
2017 survey dates: 17/9/2017 to 19/9/2017
Mean Salmon Fry/5 min (2017): 18.05 fry/5min.
CWEF Index: 15.79 fry/5min.

Sampling carried out by:
Cillian Murphy
Dara Timpson

Fish Species Present:
Brown Trout Salmon
Crayfish

Figure A.7.1.1: Length distribution of salmon captured in 2017 CWEF survey on the Duff Catchment.

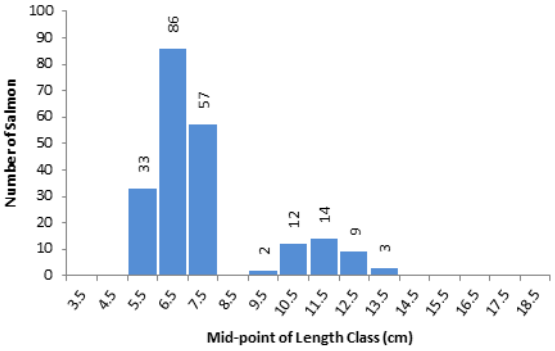


Figure A.7.1.2: Comparison of mean salmon fry/5min for all surveys on the Duff catchment to 2017.

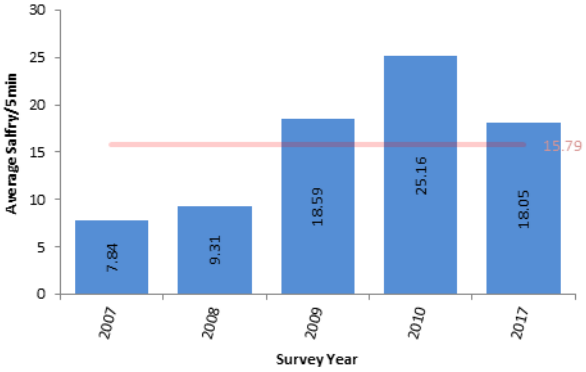


Table A.7.1.1: Conservation limits and provisional returns 2007 to 2016 on the Duff catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2006	2007	100	1	Open	11					8.77	7.84
2007	2008	1181	478	Open	10					9.65	9.31
2008	2009	1181	472	Open	9					10.72	18.59
2009	2010	1181	309	Open	11					8.77	25.16
2010	2011	1181	1140	Open							
2011	2012	1181	788	Open							
2012	2013	1181	-61	Open							
2013	2014	1068	286	Open							
2014	2015	1066	305	Open							
2015	2016	1066	217	Open							
2016	2017	1066	-31	Catch Release	11					8.77	18.05

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the fifth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 11 sites, all of which were included in the analysis. Salmon fry were present at all sites. The maximum fry catch was 30 salmon at site 3. The mean catch of included sites was 18.05 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm. A number of >0+were caught; the modal length of that cohort was 11.5cm.

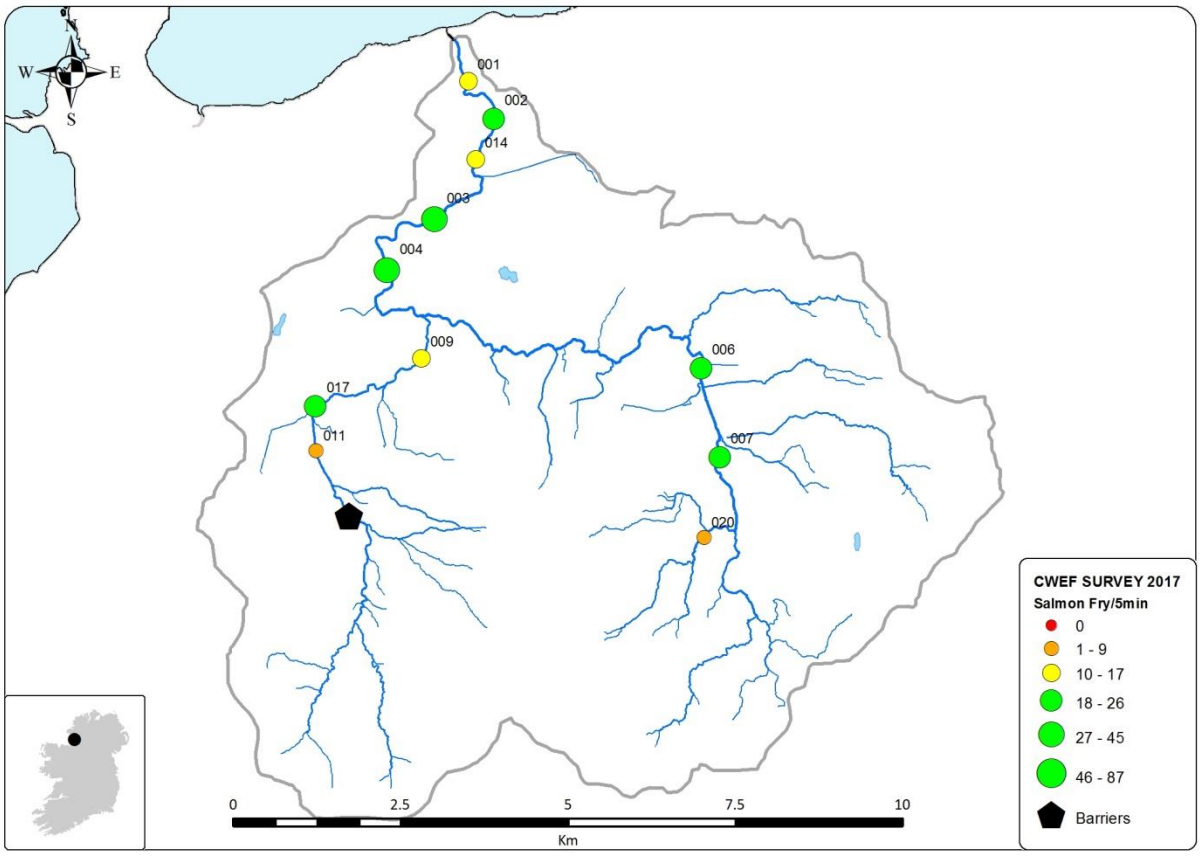
Conclusion

The Duff had a mean catch of 18.05 salmon fry/5min in 2017. Taking the five previous surveys into account this results in a cumulative average of 15.79 salmon fry/5min which is below the 17 salmon fry threshold.

Table A.7.1.2: Conservation results of CWEF on the Duff catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	G 75530 56756	5	3	0	9	Include	0.00	12.00
002	G 75912 56188	5	2	0	21	Include	0.00	23.00
003	G 75020 54697	5	1	2	30	Include	2.25	33.75
004	G 74314 53929	5	2	1	24	Include	1.12	26.88
006	G 79014 52458	5	1	0	20	Include	0.00	23.00
007	G 79292 51128	5	1	1	19	Include	1.10	20.90
009	G 74831 52608	4	2	5	8	Include	5.77	9.23
011	G 73251 51229	4	2	1	5	Include	1.00	5.00
014	G 75642 55588	5	2	0	13	Include	0.00	15.00
017	G 73246 51894	4	1	8	21	Include	8.55	22.45
020	G 79057 49932	4	1	3	6	Include	3.67	7.33

Map A.7.1.1: Showing locations of 2017 survey sites on the Duff River.



A.7.2. River Erne

IFI Salmon Catchment #: 210
2017 survey dates: 5-9/9/2017
Mean Salmon Fry/5 min (2017): 0 fry/5min.

Sampling carried out by:
Kevan Murphy
Tom Bannon

Fish Species Present:
Brown Trout
Crayfish
European Eel
Gudgeon
Minnow
Pike
Roach
Stone Loach
3-spined Stickleback

This CWEF survey of the Erne catchment was focused on a section of the Annalee catchment comprising sites on the Annalee, Knappagh and Canningstown rivers that had been surveyed previously in 2014. The survey was carried out during Sept 2017. The survey comprised 15 sites, all of which were included in the analysis. Salmon fry and parr were absent from all 12 sites.

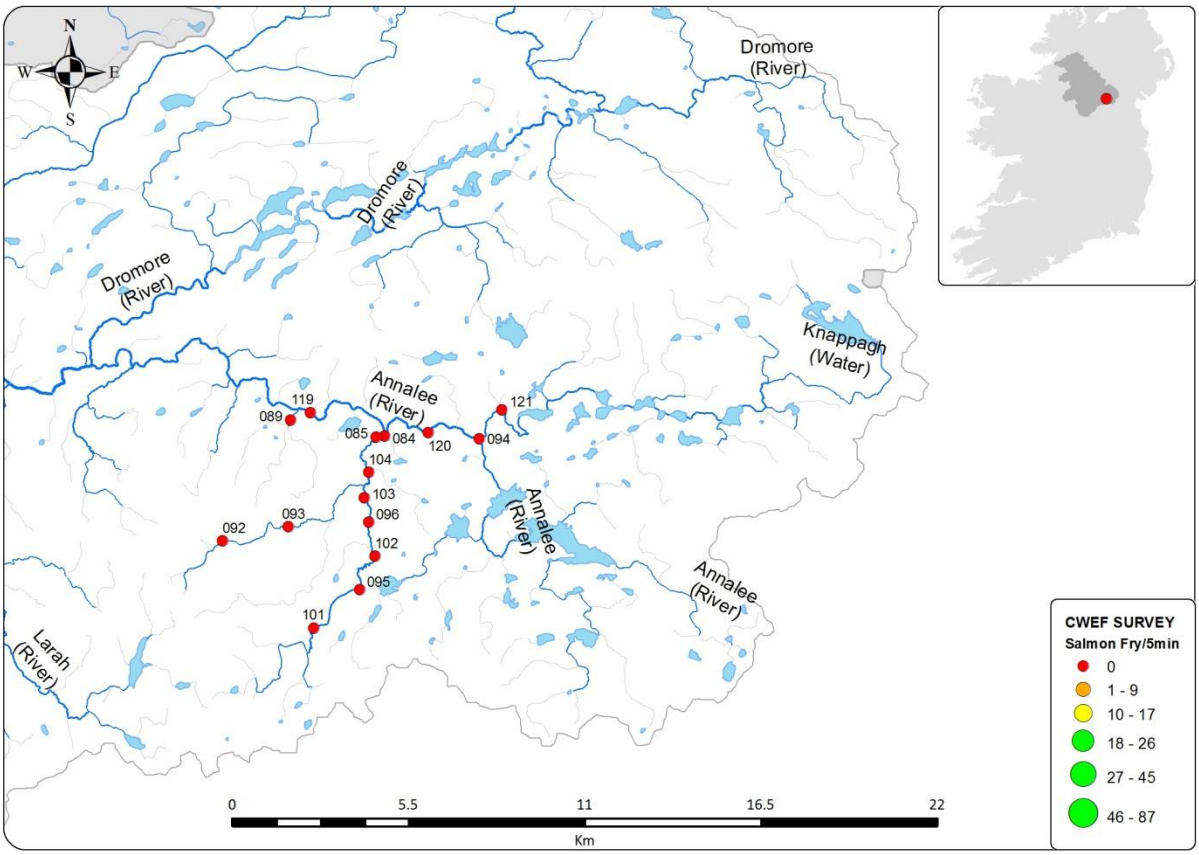
Conclusion

The absence of both salmon fry and parr means that this survey found no evidence that salmon had spawned in these areas in 2016 or 2015.

Table A.7.2.1: Site Specific results of CWEF survey on the Erne catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
084	H 64846 10040	3	2	3	0	Include	3.00	
085	H 64590 10006	3	2	0	0	Include		
089	H 61908 10546	2	1	0	0	Include		
092	H 59793 06763	2	2	0	0	Include		
093	H 61835 07217	2	2	0	0	Include		
094	H 67795 09957	3	2	1	0	Include	1.00	
095	H 64063 05244	3	2	3	0	Include	3.00	
096	H 64357 07348	3	2	4	0	Include	4.00	
101	H 62643 04055	3	2	2	0	Include	2.00	
102	H 64546 06299	3	2	5	0	Include	5.00	
103	H 64209 08120	3	2	2	0	Include	2.00	
104	H 64358 08912	3	2	3	0	Include	3.00	
119	H 62535 10777	4	2	5	0	Include	5.00	
120	H 66201 10160	4	2	0	0	Include		
121	H 68517 10863	3	2	0	0	Include		

Map A.7.2.1: Showing locations of 2017 survey sites on the Erne River.



A.7.3. River Oily

IFI Salmon Catchment #: 216
2017 survey dates: 25-26/9/2017
Mean Salmon Fry/5 min (2017): 21.26 fry/5min.
CWEF Index: 20.26 fry/5min.

Sampling carried out by:
Cillian Murphy
Dara Timpson

Fish Species Present:
Brown Trout Salmon
European Eel

Figure A.7.3.1: Length distribution of salmon captured in 2017 CWEF survey on the Oily Catchment.

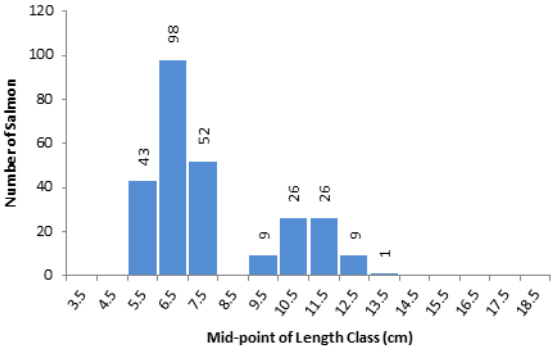


Figure A.7.3.2: Comparison of mean salmon fry/5min for all surveys on the Oily catchment to 2017.

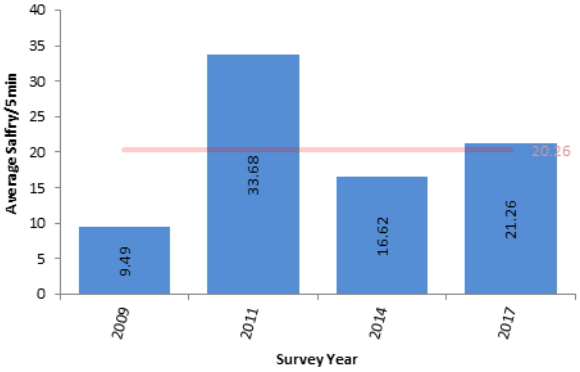


Table A.7.3.1: Conservation limits and provisional returns on the Oily catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	548	-156	Catch Release							
2008	2009	548	-153	Catch Release	11					4.20	9.49
2009	2010	548	-153	Catch Release							
2010	2011	548	-153	Catch Release	7					6.60	33.68
2011	2012	548	-153	Catch Release							
2012	2013	548	-114	Catch Release							
2013	2014	627	-375	Catch Release	13					3.55	16.62
2014	2015	629	-330	Catch Release							
2015	2016	629	-351	Catch Release							
2016	2017	629	-319	Catch Release	10	1				4.20	21.26

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the fourth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 11 sites, 10 of which were included in the analysis. Salmon fry were present at all sites. The maximum fry catch was 36 salmon at site 5. The mean catch of included sites was 21.26 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

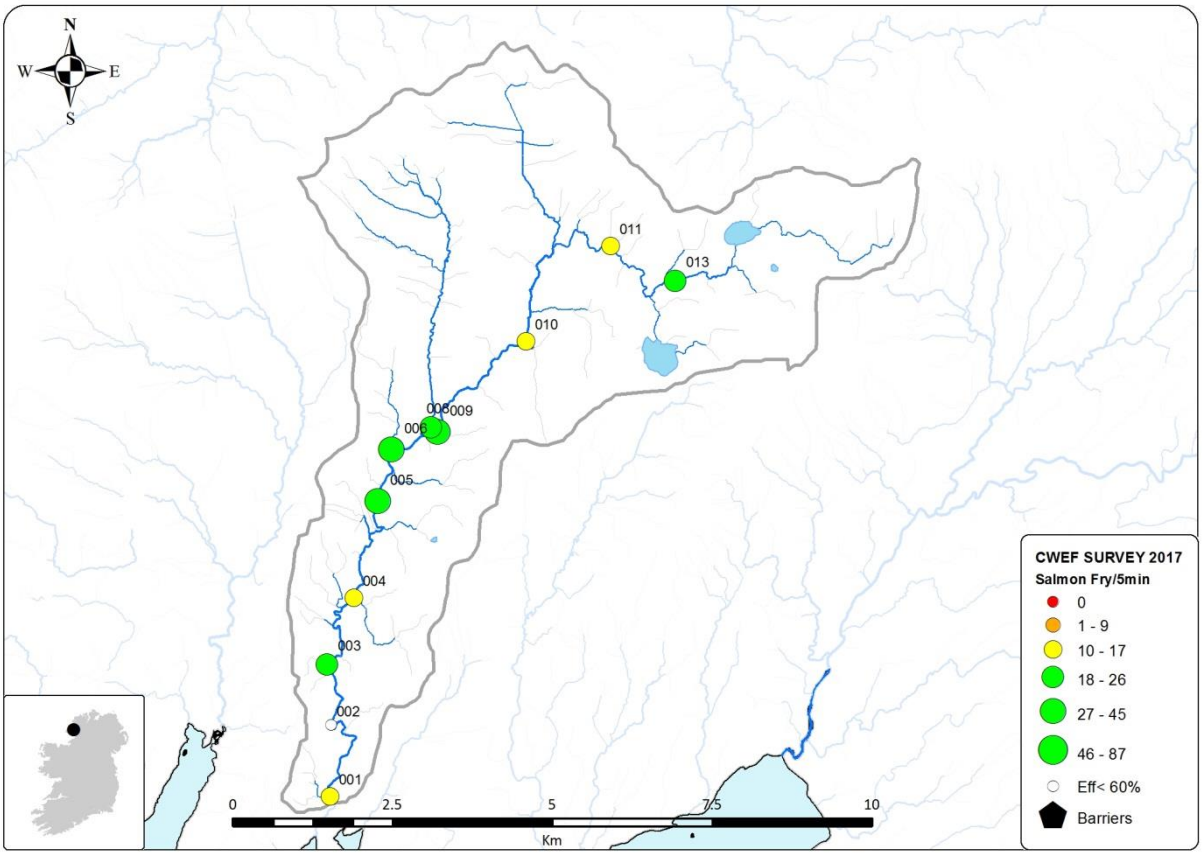
Conclusion

The Oily had a mean catch of 21.26 salmon fry/5min in 2017. Taking the four previous surveys into account this results in a cumulative average of 20.26 salmon fry/5min which is above the 17 salmon fry threshold.

Table A.7.3.2: Conservation results of CWEF on the Oily catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	G 74639 77008	4	1	7	10	Include	7.82	11.18
003	G 74597 79073	4	1	0	18	Include	0.00	19.00
004	G 75018 80116	4	3	2	13	Include	2.27	14.73
005	G 75389 81639	4	1	4	36	Include	4.30	38.70
006	G 75605 82450	4	1	3	25	Include	3.21	26.79
008	G 76226 82784	3	2	3	17	Include	3.60	20.40
009	G 76323 82730	4	1	4	26	Include	4.40	28.60
010	G 77708 84137	4	2	2	12	Include	2.43	14.57
011	G 79035 85635	3	2	2	14	Include	2.38	16.63
013	G 80047 85087	3	2	0	18	Include	0.00	22.00
002	G 74662 78122	4	3	0	4	Eff <60%		

Map A.7.3.1: Showing locations of 2017 survey sites on Oily River.



A.7.4. River Bungosteen

IFI Salmon Catchment #: 217
2017 survey dates: 18/9/2017
Mean Salmon Fry/5 min (2017): 13.17 fry/5min.
CWEF Index: 20.10 fry/5min.

Sampling carried out by:
Cillian Murphy
Dara Timpson

Fish Species Present:
Brown Trout Salmon
European Eel

Figure A.7.4.1: Length distribution of salmon captured in 2017 CWEF survey on the Bungosteen Catchment.

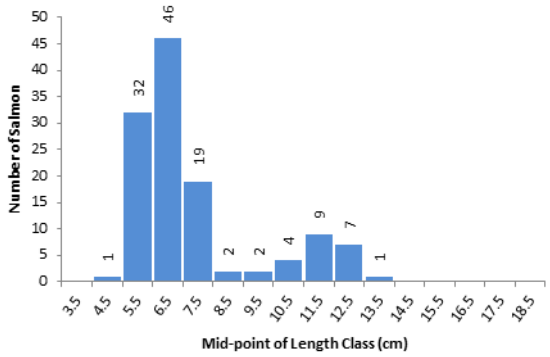


Figure A.7.4.2: Comparison of mean salmon fry/5min for all surveys on the Bungosteen catchment to 2017.

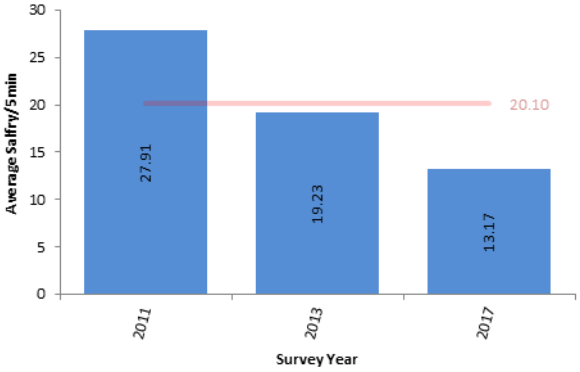


Table A.7.4.1: Conservation limits and provisional returns on the Bungosteen catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	418	-182	Closed							
2008	2009	418	-182	Closed							
2009	2010	418	-182	Closed							
2010	2011	418	-182	Closed	9			1		4.41	27.91
2011	2012	418	-182	Closed							
2012	2013	418	-182	Catch Release	8	1		1		4.41	19.23
2013	2014	374	-205	Catch Release							
2014	2015	373	-201	Catch Release							
2015	2016	373	-242	Catch Release							
2016	2017	373	-258	Catch Release	9			1		4.41	13.17

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the third CWEF survey of this catchment in the 2007 to 2017 period, was carried out on the 18th Sept 2017. The survey comprised 10 sites, 9 of which were included in the analysis. Salmon fry were present at 9 sites. The maximum fry catch was 26 salmon at site 9. The mean catch of included sites was 13.17 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm

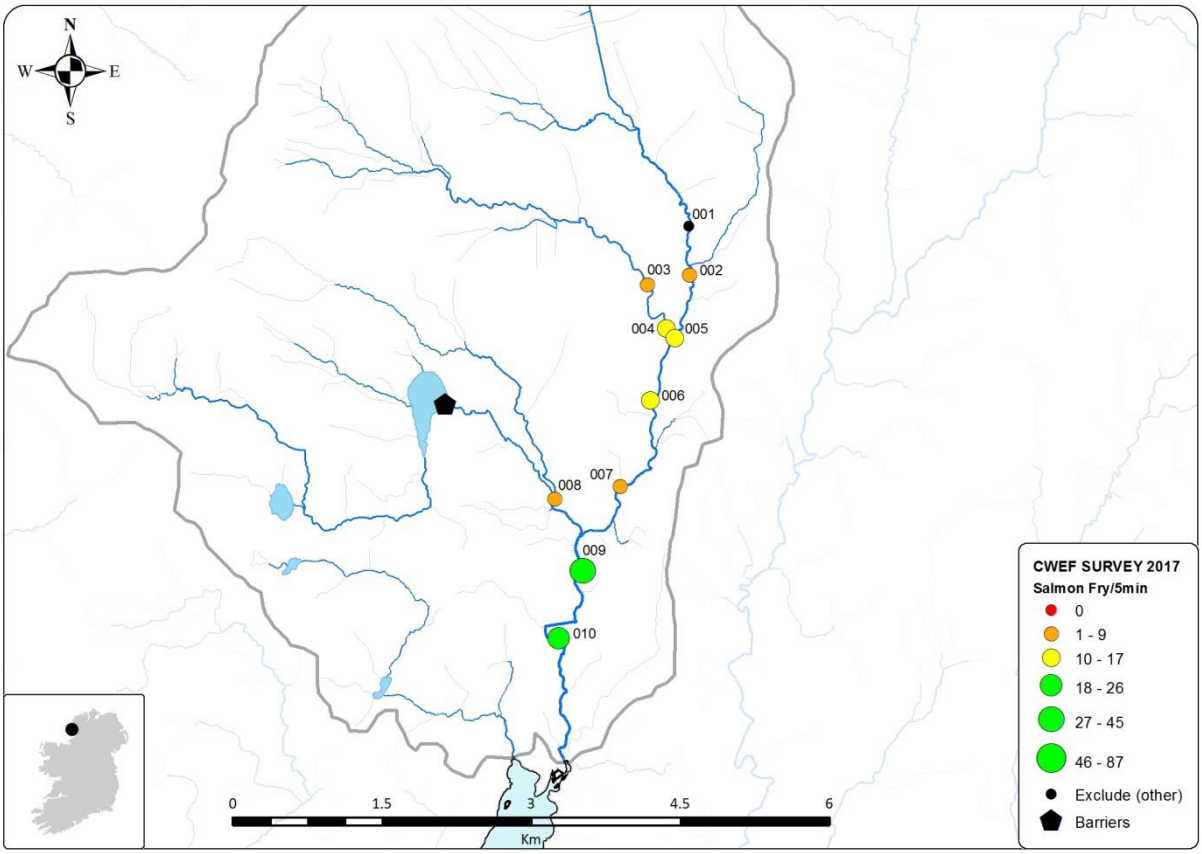
Conclusion

The Bungosteen had a mean catch of 13.17 salmon fry/5min in 2017. Taking three previous surveys into account this results in a cumulative average of 20.10 salmon fry/5min which is above the 17 salmon fry threshold. There has been a reduction in the numbers of fry caught at each survey since 2011.

Table A.7.4.2: Conservation results of CWEF on the Bungosteen catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
002	G 74205 83030	4	1	4	7	Include	4.00	7.00
003	G 73778 82937	3	2	1	5	Include	1.00	5.00
004	G 73970 82495	3	1	3	12	Include	3.60	14.40
005	G 74052 82396	4	2	3	9	Include	4.00	12.00
006	G 73808 81766	4	2	0	8	Include	0.00	11.00
007	G 73504 80901	4	3	0	6	Include	0.00	8.00
008	G 72847 80771	3	2	1	5	Include	1.33	6.67
009	G 73126 80051	5	1	0	26	Include	0.00	30.00
010	G 72890 79366	5	1	5	22	Include	5.56	24.44
001	G 74199 83525	4	3	11	0	No Salmon Seen At Any Survey.		

Map A.7.4.1: Showing locations of 2017 survey sites Bungosteen River.



A.7.5. River Lackagh

IFI Salmon Catchment #: 240
2017 survey dates: 18-26/9/2017
Mean Salmon Fry/5 min (2017): 6.88 fry/5min.
CWEF Index: 12.35 fry/5min.

Sampling carried out by:
Cornelius McMullan
John McCallig
Matthew Kelly

Fish Species Present:
Brown Trout
Salmon

Figure A.7.5.1: Length distribution of salmon captured in 2017 CWEF survey on the Lackagh Catchment.

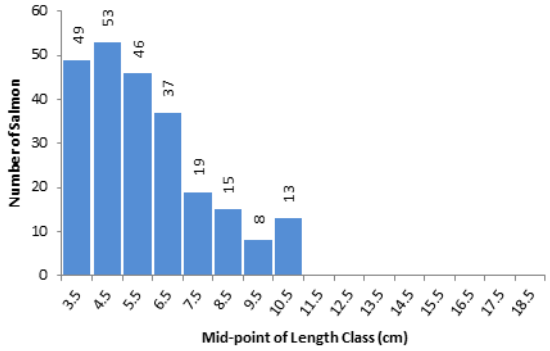


Figure A.7.5.2: Comparison of mean salmon fry/5min for all surveys on the Lackagh catchment to 2017.

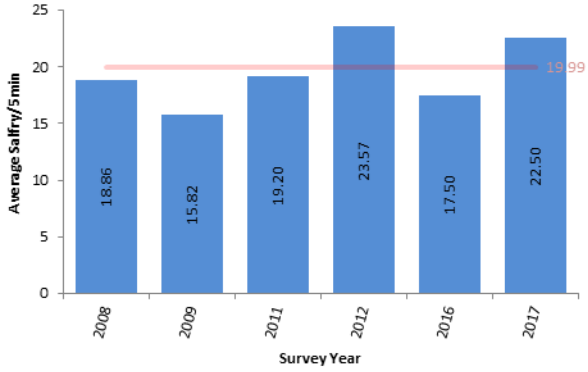


Table A.7.5.1: Conservation limits and provisional returns on the Lackagh catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	1083	-445	Closed	7			3		9.06	18.86
2008	2009	1083	-420	Closed	9			3		7.55	15.82
2009	2010	1083	-423	Closed							
2010	2011	1083	-504	Closed	12			2		6.47	19.20
2011	2012	1083	-504	Closed	11			3		6.47	23.57
2012	2013	1083	-503	Closed							
2013	2014	234	-118	Closed							
2014	2015	235	-117	Catch Release							
2015	2016	235	-43	Catch Release	6					15.11	17.50
2016	2017	235	-27	Catch Release	11					8.24	22.50

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit.

This, the sixth CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 11 sites, all of which were included in the analysis. Salmon fry were present at 9 sites. The maximum fry catch was 52 salmon at site 1. The mean catch of included sites was 22.50 salmon fry/5min. The modal length category of 0+ fry caught was 4.5cm.

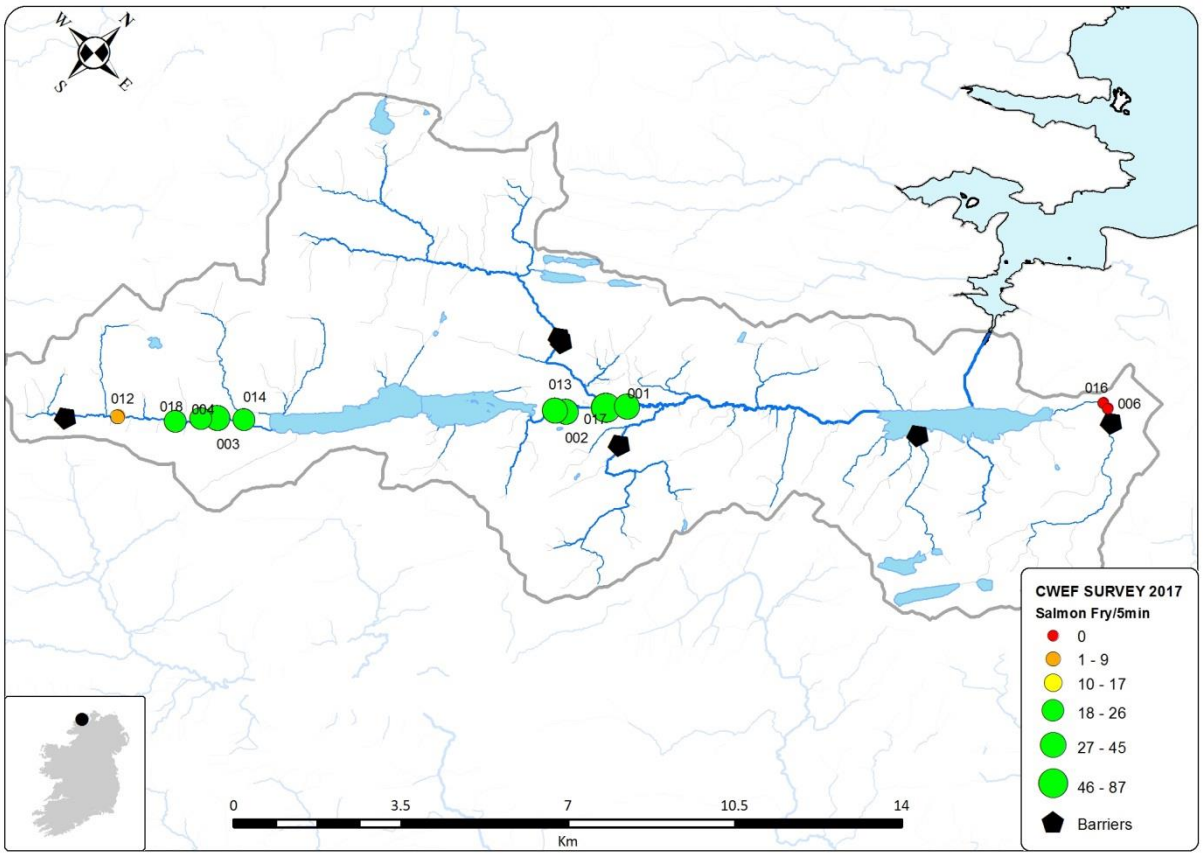
Conclusion

The Lackagh had a mean catch of 22.50 5 salmon fry/5min in 2017. Taking the five most recent surveys into account this results in a cumulative average of 19.58 salmon fry/5min which is above the 17 salmon fry threshold.

Table A.7.5.2: Conservation results of CWEF on the Lackagh catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	C 04958 24203	5	1	9	52	Include	9.00	52.00
002	C 04410 23546	4	3	10	36	Include	10.00	36.00
003	B 99336 18288	3	2	13	26	Include	15.33	30.67
004	B 98776 17614	3	3	8	20	Include	9.14	22.86
006	C 12410 31640	2	3	12	0	Include	12.00	0.00
012	B 97847 16839	3	3	13	1	Include	17.64	1.36
013	C 04234 23412	4	2	5	23	Include	6.25	28.75
014	B 99774 18654	3	1	2	19	Include	2.57	24.43
016	C 12264 31652	2	2	8	0	Include	22.00	0.00
017	C 05242 24537	5	1	2	26	Include	2.57	33.43
018	B 99113 18030	3	3	8	16	Include	9.00	18.00

Map A.7.5.1: Showing locations of 2017 survey sites on the Lackagh River.



A.7.6. River Leannan

IFI Salmon Catchment #: 102
2017 survey dates: 25-26/9/2017
Mean Salmon Fry/5 min (2017): 18.66 fry/5min.
CWEF Index: 19.16 fry/5min.

Sampling carried out by:
Cornelius McMullan
John McCallig
Matthew Kelly

Fish Species Present:
Brown Trout
European Eel
Stone Loach
Salmon

Figure A.7.6.1: Length distribution of salmon captured in 2017 CWEF survey on the Leannan Catchment.

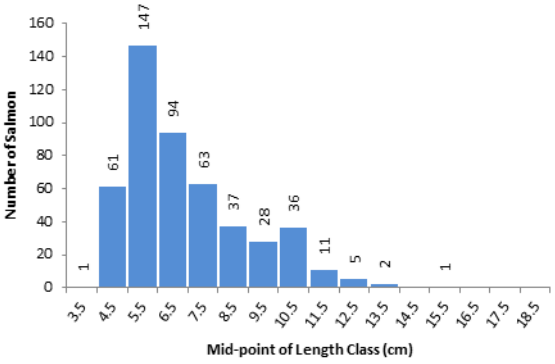


Figure A.7.6.2: Comparison of mean salmon fry/5min for all surveys on the Leannan catchment to 2017.

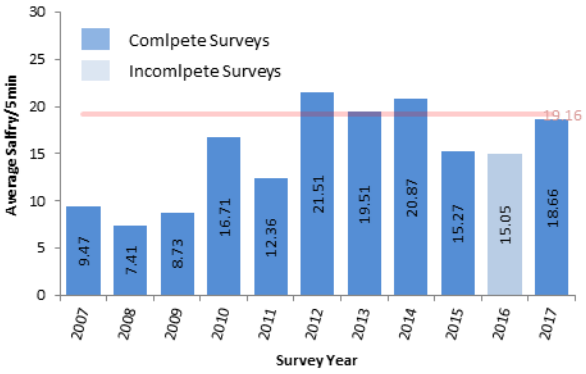


Table A.7.6.1: Conservation limits and provisional returns on the Leannan catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	3618	-2820	Closed	29					7.55	7.41
2008	2009	3618	-2620	Closed	29					7.55	8.73
2009	2010	3618	-2619	Closed	29					7.55	16.71
2010	2011	3618	-2609	Closed	28	1				7.55	12.36
2011	2012	3618	-2612	Closed	28				1	7.55	21.51
2012	2013	3618	-2612	Closed	26					8.42	19.51
2013	2014	516	-410	Closed	26					8.42	20.87
2014	2015	516	-409	Closed	25	1				8.42	15.27
2015	2016	516	-409	Catch Release	20					10.95	15.05†
2016	2017	516	-409	Catch Release	24	5				7.55	18.66

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit; †=Incomplete surveys

This, the tenth complete CWEF survey of this catchment in the 2007 to 2017 period, was carried out during Sept 2017. The survey comprised 29 sites, 24 of which were included in the analysis. Salmon fry were present at 25 sites. The maximum fry catch was 50 salmon at site 14. The mean catch of included sites was 18.66 salmon fry/5min. The modal length category of 0+ fry caught was 5.5cm.

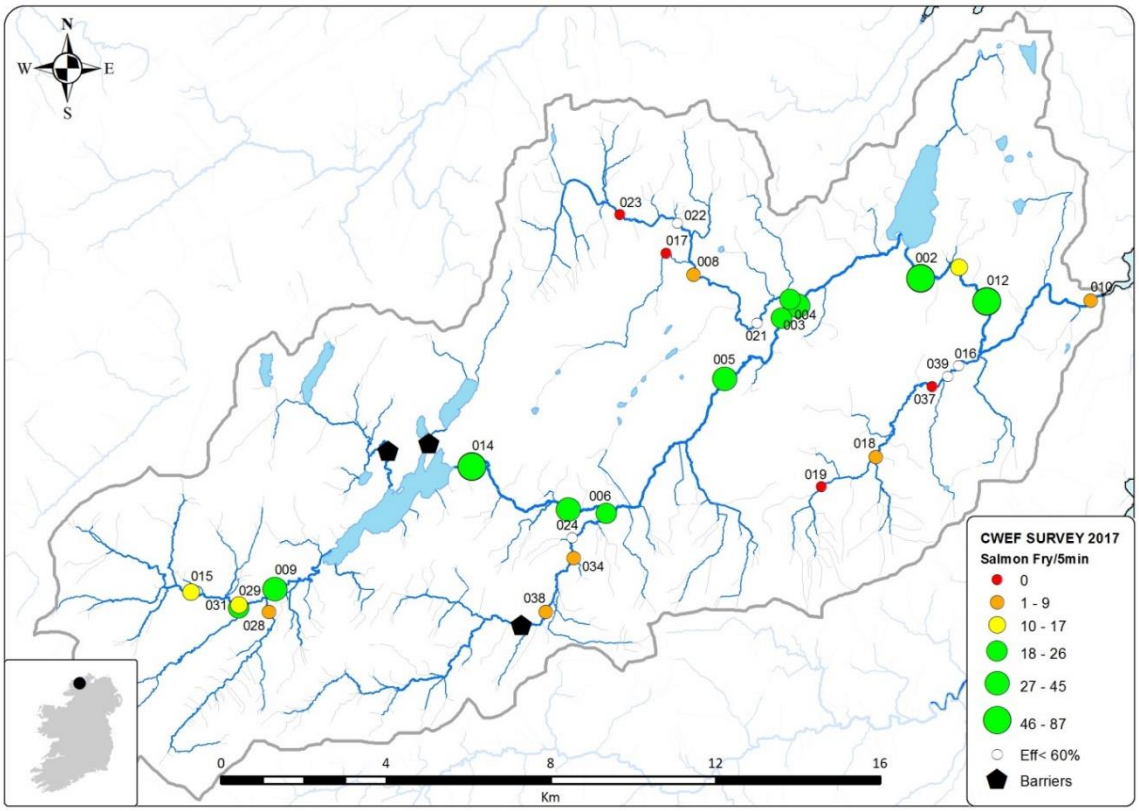
Conclusion

The Leannan had a mean catch of 18.66 salmon fry/5min in 2017. Taking the five most recent surveys into account this results in a cumulative average of 19.16 salmon fry/5min which is above the 17 salmon fry threshold.

Table A.7.6.2: Conservation results of CWEF on the Leannan catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
001	C 19032 21832	5	3	6	11	Include	7.76	14.24
002	C 18110 21555	5	2	11	44	Include	12.40	49.60
003	C 15115 20910	5	1	5	25	Include	6.50	32.50
004	C 14722 20597	5	1	1	18	Include	1.05	18.95
005	C 13349 19129	5	2	4	23	Include	5.19	29.81
006	C 10470 15850	5	1	8	15	Include	10.09	18.91
008	C 12588 21655	4	2	11	6	Include	11.00	6.00
009	C 02422 14028	4	1	2	38	Include	2.00	38.00
010	C 22234 21028	5	3	4	1	Include	4.00	1.00
012	C 19710 21001	5	1	2	49	Include	2.43	59.57
013	C 09540 15957	5	3	2	23	Include	2.32	26.68
014	C 07206 16991	5	1	2	50	Include	2.42	60.58
015	C 00385 13956	4	2	5	11	Include	5.00	11.00
017	C 11925 22178	2	1	16	0	Include	16.00	0.00
018	C 17013 17222	4	1	5	1	Include	6.67	1.33
019	C 15696 16505	3	2	9	0	Include	9.00	0.00
020	C 14938 21045	4	1	3	17	Include	4.35	24.65
023	C 10793 23117	4	2	15	0	Include	15.00	0.00
028	C 02269 13466	3	3	13	1	Include	13.00	1.00
029	C 01542 13558	3	2	5	24	Include	5.00	24.00
031	C 01544 13637	4	2	4	14	Include	4.00	14.00
034	C 09680 14776	4	2	1	9	Include	1.00	9.00
037	C 18382 18934	4	3	5	0	Include	10.00	0.00
038	C 09004 13462	4	2	2	7	Include	2.00	7.00
016	C 19019 19448	4	2	5	5	Eff <60%		
021	C 14125 20475	4	2	10	7	Eff <60%		
022	C 12199 22907	4	2	15	1	Eff <60%		
024	C 09643 15275	4	1	3	1	Eff <60%		
039	C 18760 19189	4	3	8	2	Eff <60%		

Map A.7.6.1: Showing locations of 2017 survey sites on the Leannan River.



A.7.7. River Crana

IFI Salmon Catchment #: 253
2017 survey dates: 26/9/2017
Mean Salmon Fry/5 min (2017): - fry/5min.
CWEF Index: 15.74 fry/5min.

Sampling carried out by:
Cornelius McMullan
John McCallig
Matthew Kelly

Fish Species Present:
Brown Trout
Salmon

Figure A.7.7.1: Length distribution of salmon captured in 2017 CWEF survey on the Crana Catchment.

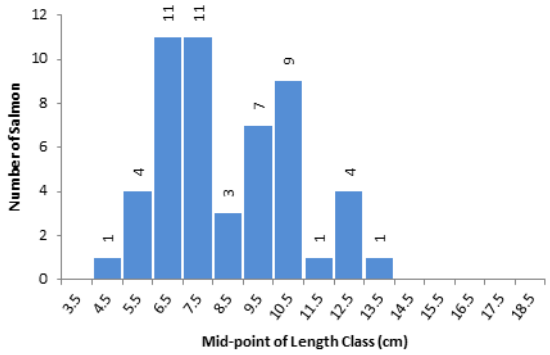


Figure A.7.7.2: Comparison of mean salmon fry/5min for all surveys on the Crana catchment to 2017.

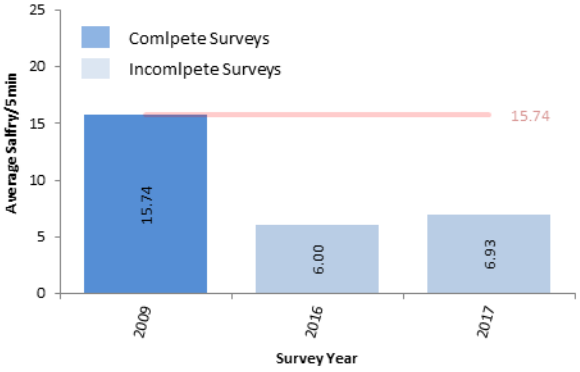


Table A.7.7.1: Conservation limits and provisional returns on the Crana catchment along with the details and results of 2017 CWEF Survey.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Salmon Fry/5min
2007	2008	1119	431	Open							
2008	2009	1119	611	Open	23	1				3.61	15.74
2009	2010	1119	682	Open							
2010	2011	1119	676	Open							
2011	2012	1119	663	Open							
2012	2013	1119	457	Open							
2013	2014	1073	635	Open							
2014	2015	1074	160	Open							
2015	2016	1074	280	Open	2					43.29	6.00†
2016	2017	1074	-41	Catch Release	6	1				12.37	6.93†

C&R = Catch and Release; 1SW = One Sea Winter; CL= Conservation Limit. †=Incomplete surveys

The CWEF survey of this catchment in 2017 was carried out during on the 29th of Sept 2017. This was shortly after an extreme rainfall event that occurred on the Inishowen peninsular on the 22nd of August 2017. The subsequent flooding severely affected the habitat in several of the rivers in the area including the Crana. This survey was undertaken to assess the salmonid presence at previously surveyed sites within the system. The survey comprised 7 sites. Salmon fry were present at 6 sites. The maximum fry catch was 8 salmon at site 7. The mean catch of included sites was 6.93 salmon fry/5min. Trout fry were present at all sites, with amaximum of 16 fry observed at site 13.

Conclusion

Salmon and trout fry were observed at sites throughout the system, Salmon fry numbers were in general much lower than had been observed previously. Trout fry numbers showed no clear pattern of change since 2009- some sites had greater numbers, other lower numbers. A more thorough survey of this catchment would be necessary to assess the medium and long term changes in this catchment following the flooding event.

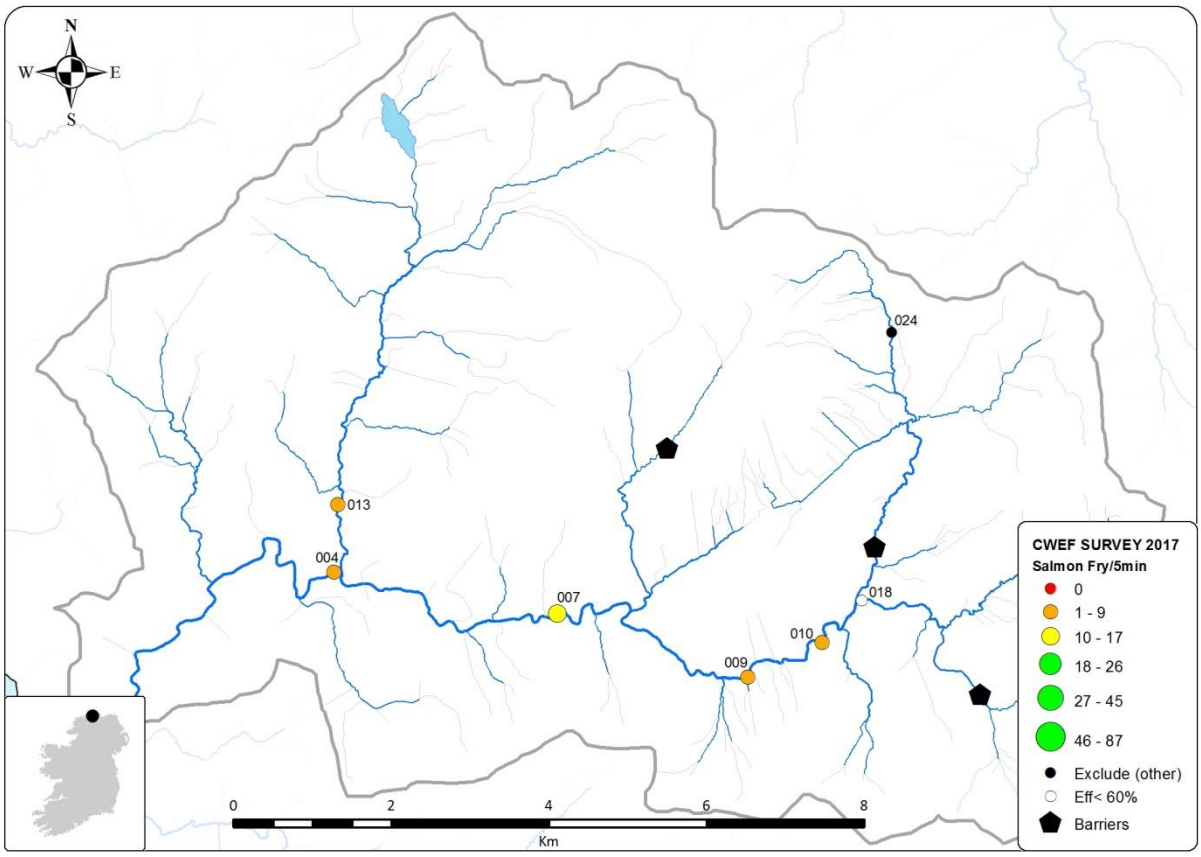
Table A.7.7.2: CWEF results of CWEF on the Crana catchment in 2017.

Site #	Grid Ref.	Stream Order	Riffle Grade	Trout Fry Captured	Salmon Fry Captured	Site Status	Trout Fry/5min	Salmon Fry/5min
004	C 37490 34645	5	3	8	7	Include	8.00	7.00
007	C 40325 34119	5	3	7	8	Include	9.80	11.20
009	C 42742 33314	5	1	4	6	Include	4.00	6.00
010	C 43692 33754	5	2	7	2	Include	7.00	2.00
013	C 37540 35502	4	1	16	6	Include	22.55	8.45
024	C 44573 37679	3	3	5	0	Above Barrier		
018	C 44188 34284	4	1	1	1	Eff <60%		

Table A.7.7.3: Comparison of results of CWEF on the Crana catchment in 2009 and 2017.

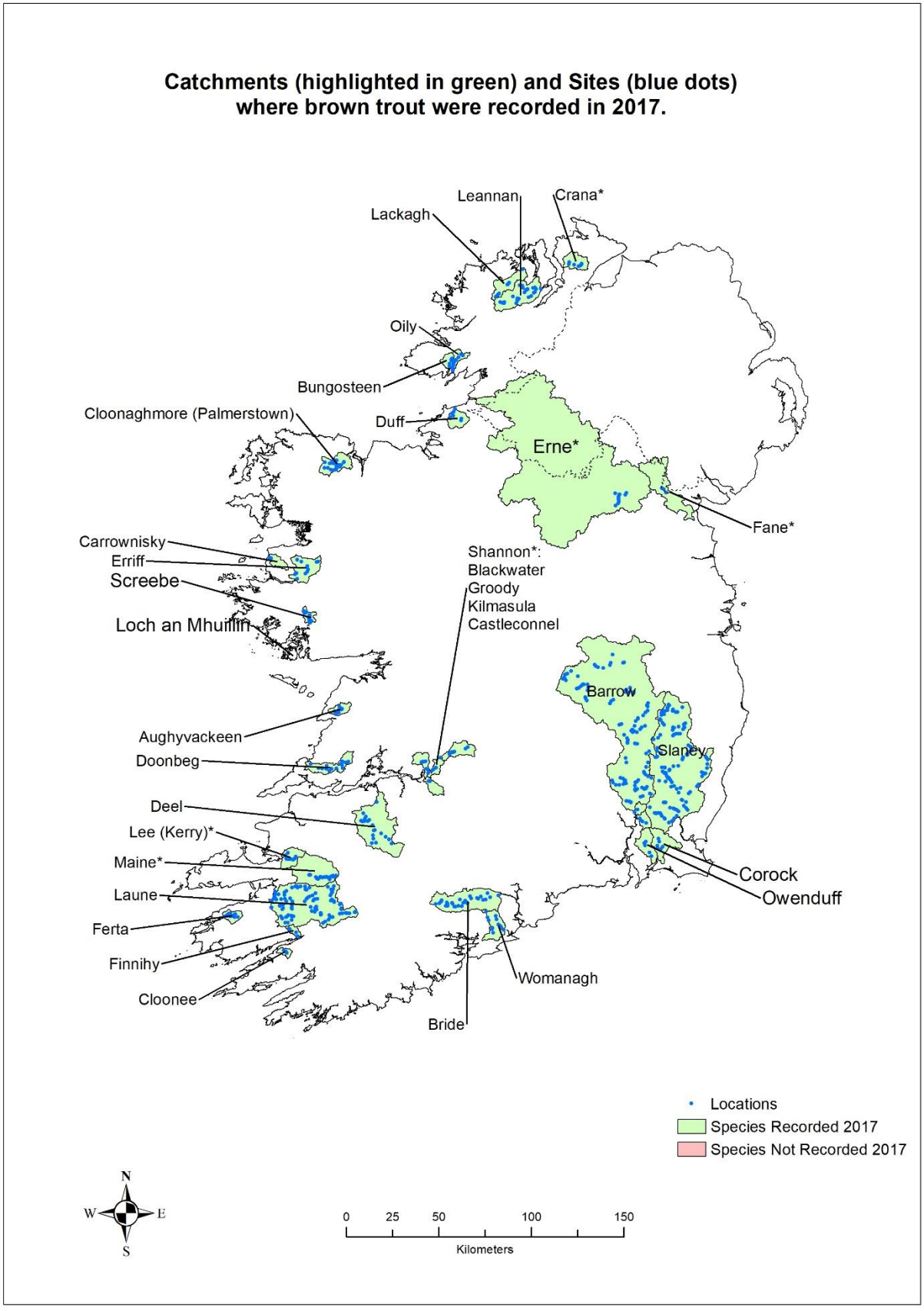
	Salmon Fry/5min		Trout Fry/5min	
Site #	2009	2017	2009	2017
004	15.79	7	1.21	8
007	27.84	11.2	1.16	9.8
009	25.04	6	5.96	4
010	43.5	2	14.5	7
013	27.5	8.45	5.5	22.55
024	14.53	3	8.47	3
018	0	0	4	5

Map A.2.2.1: Showing locations of 2017 survey sites on the Crana River.

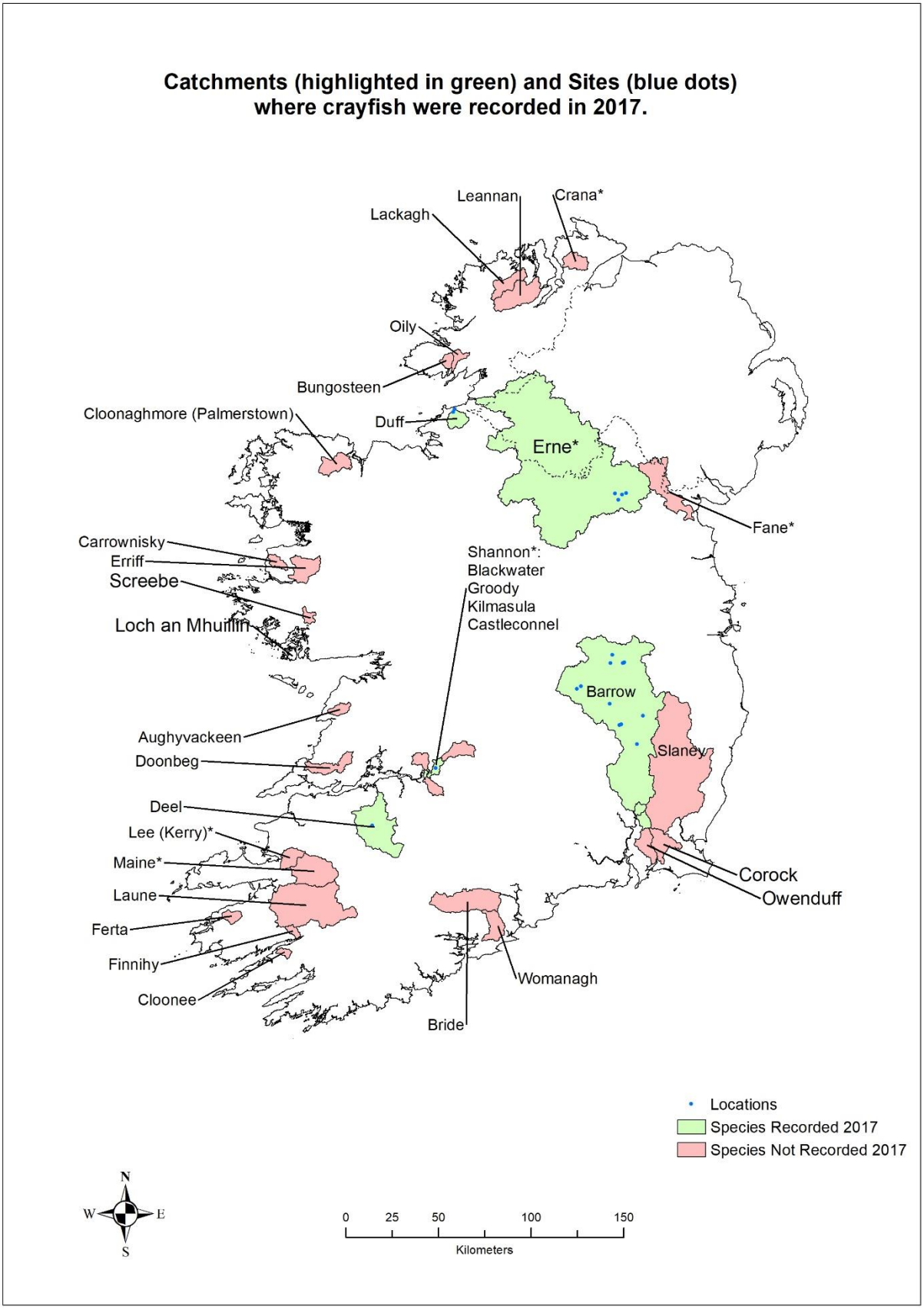


B. Other Species

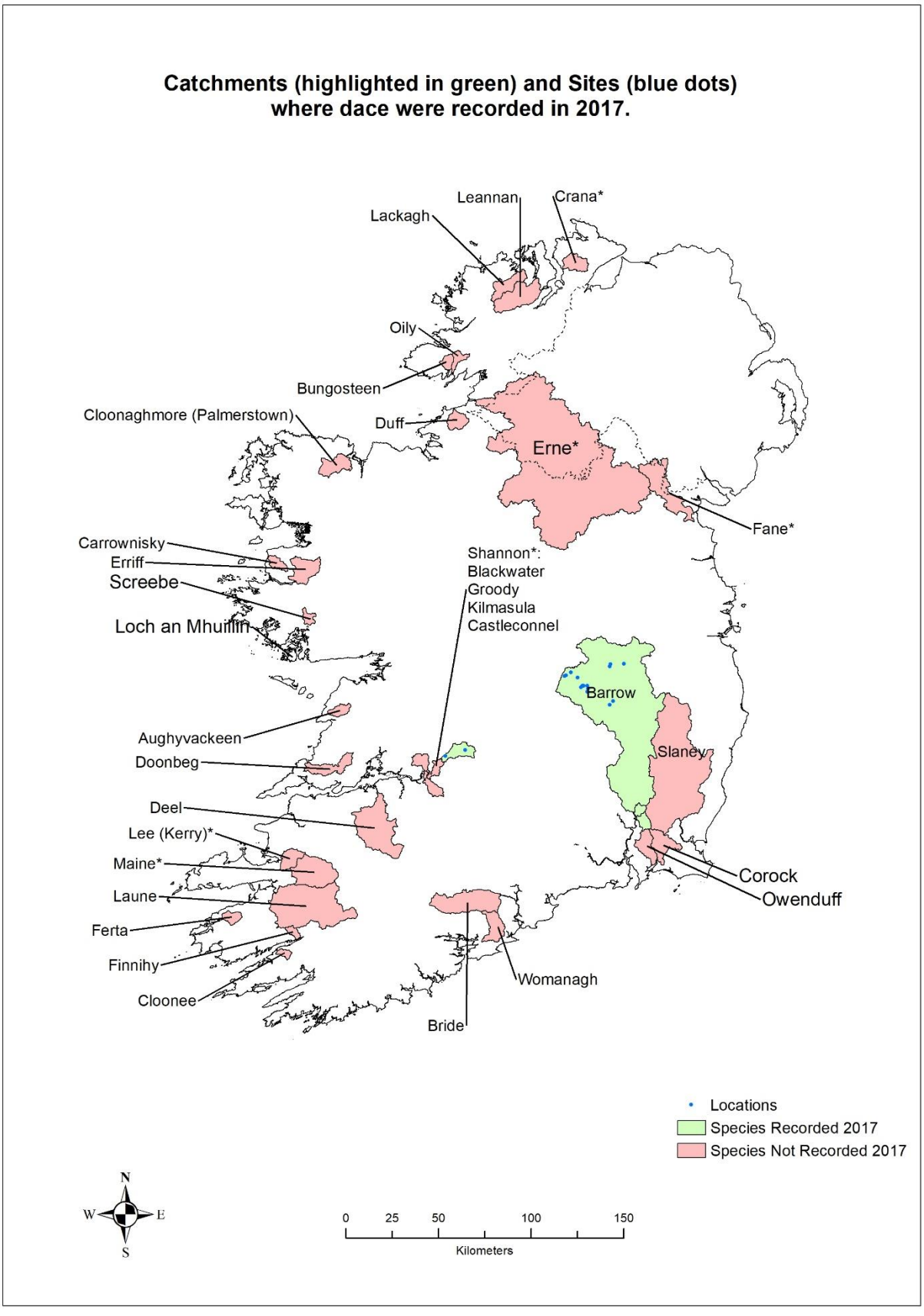
B.1. Brown Trout



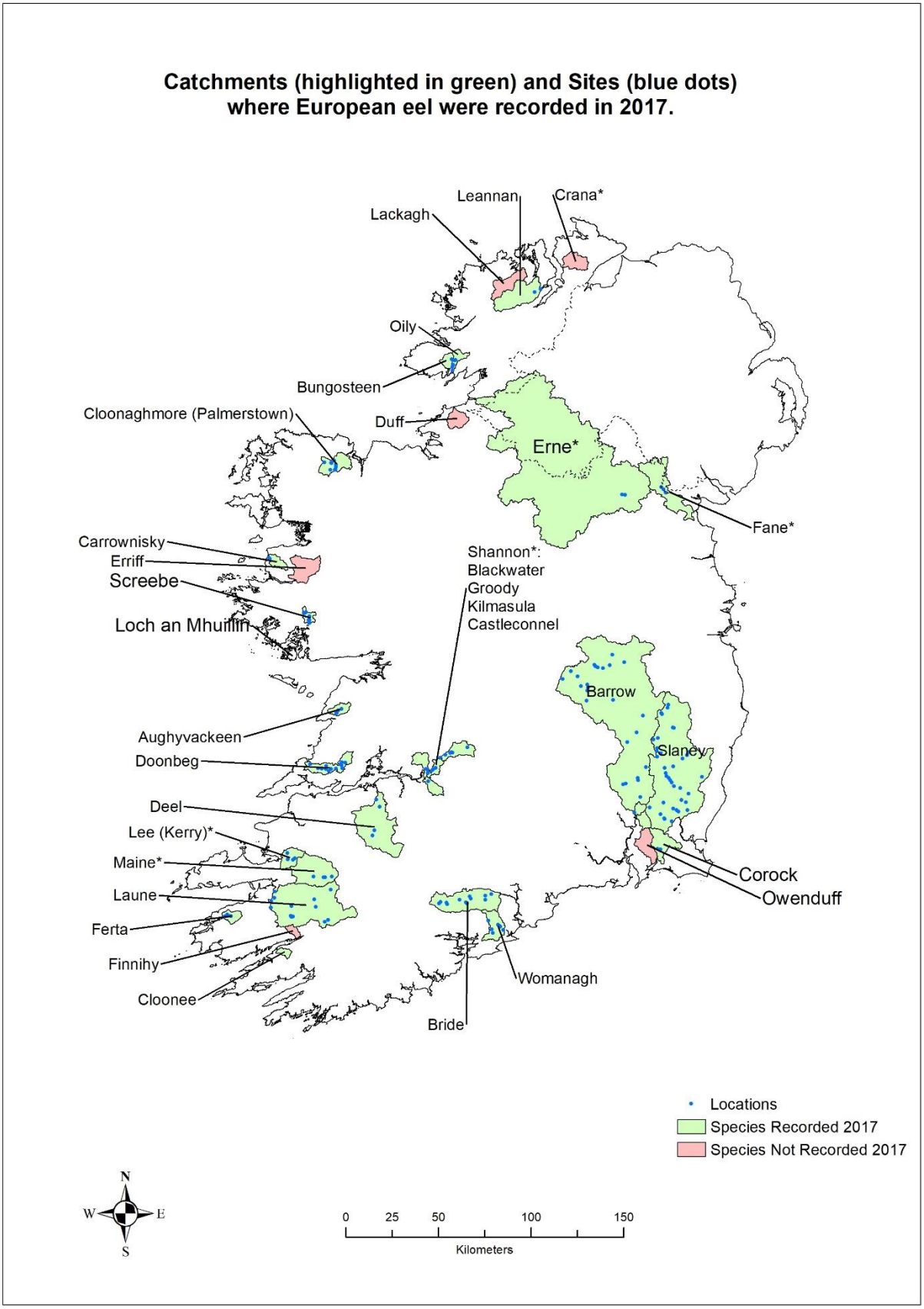
B.2. Crayfish


Catchments (highlighted in green) and Sites (blue dots) where crayfish were recorded in 2017.
Leannan
Crana*
Lackagh
Oily
Bungosteen
Cloonaghmore (Palmerstown)
Duff
Erne*
Fane*
Carrownisky
Erriff
Screebe
Loch an Mhuilinn
Shannon*:
Blackwater
Groody
Kilmasula
Castleconnel
Barrow
Slaney
Aughyvackeen
Doonbeg
Deel
Lee (Kerry)*
Maine*
Laune
Ferta
Finnihy
Cloonee
Corock
Owenduff
Womanagh
Bride
Locations
Species Recorded 2017
Species Not Recorded 2017
N
W
E
S
0
25
50
100
150
Kilometers

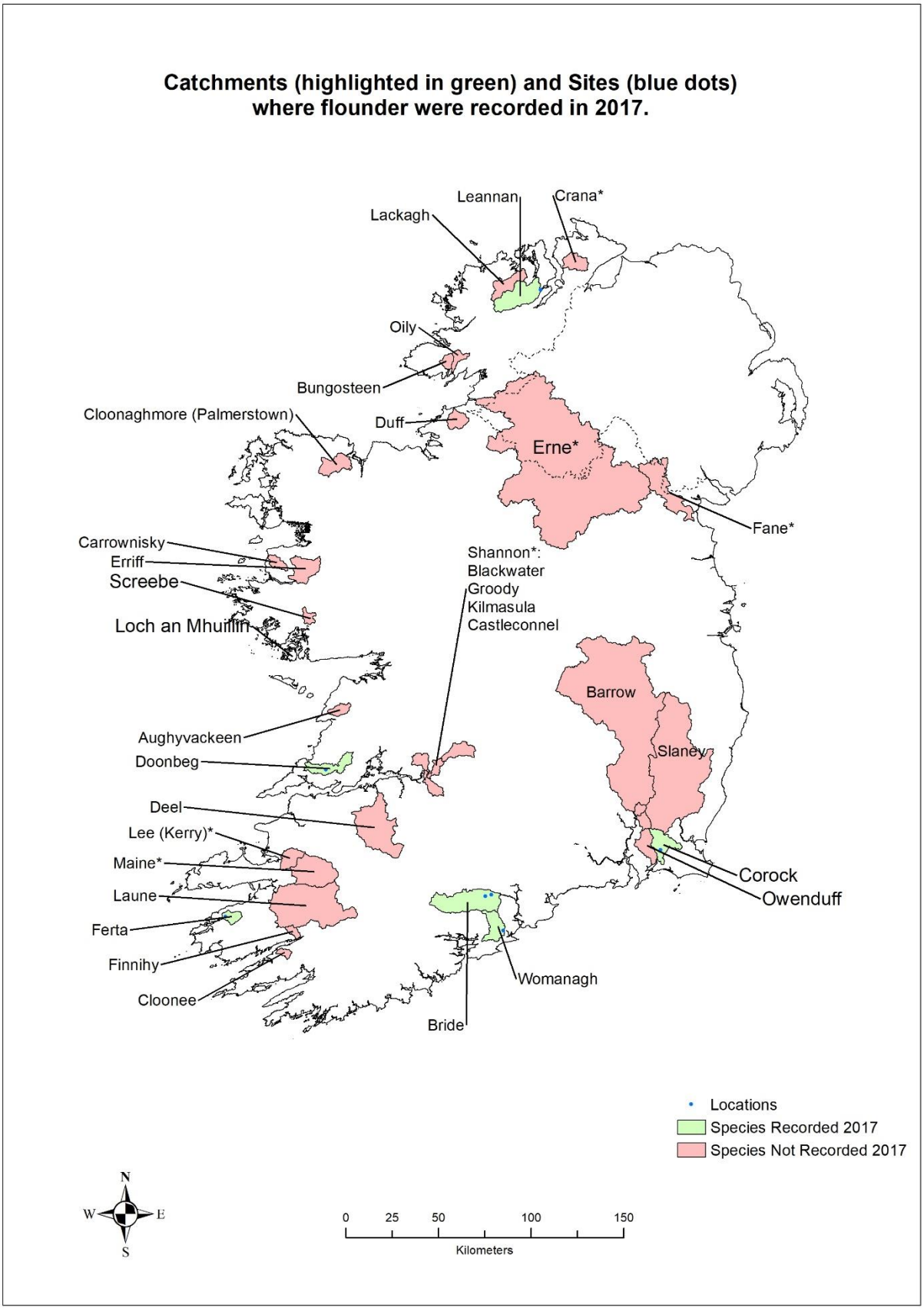
B.3. Dace


Catchments (highlighted in green) and Sites (blue dots)
where dace were recorded in 2017.
Leannan
Crana*
Lackagh
Oily
Bungosteen
Cloonaghmore (Palmerstown)
Duff
Erne*
Fane*
Carrownisky
Erriff
Screebe
Loch an Mhuillin
Shannon*:
Blackwater
Groody
Kilmasula
Castleconnel
Barrow
Slaney
Aughyvackeen
Doonbeg
Deel
Lee (Kerry)*
Maine*
Laune
Ferta
Finnihy
Cloonee
Corock
Owenduff
Womanagh
Bride
Locations
Species Recorded 2017
Species Not Recorded 2017
N
W
E
S
0
25
50
100
150
Kilometers

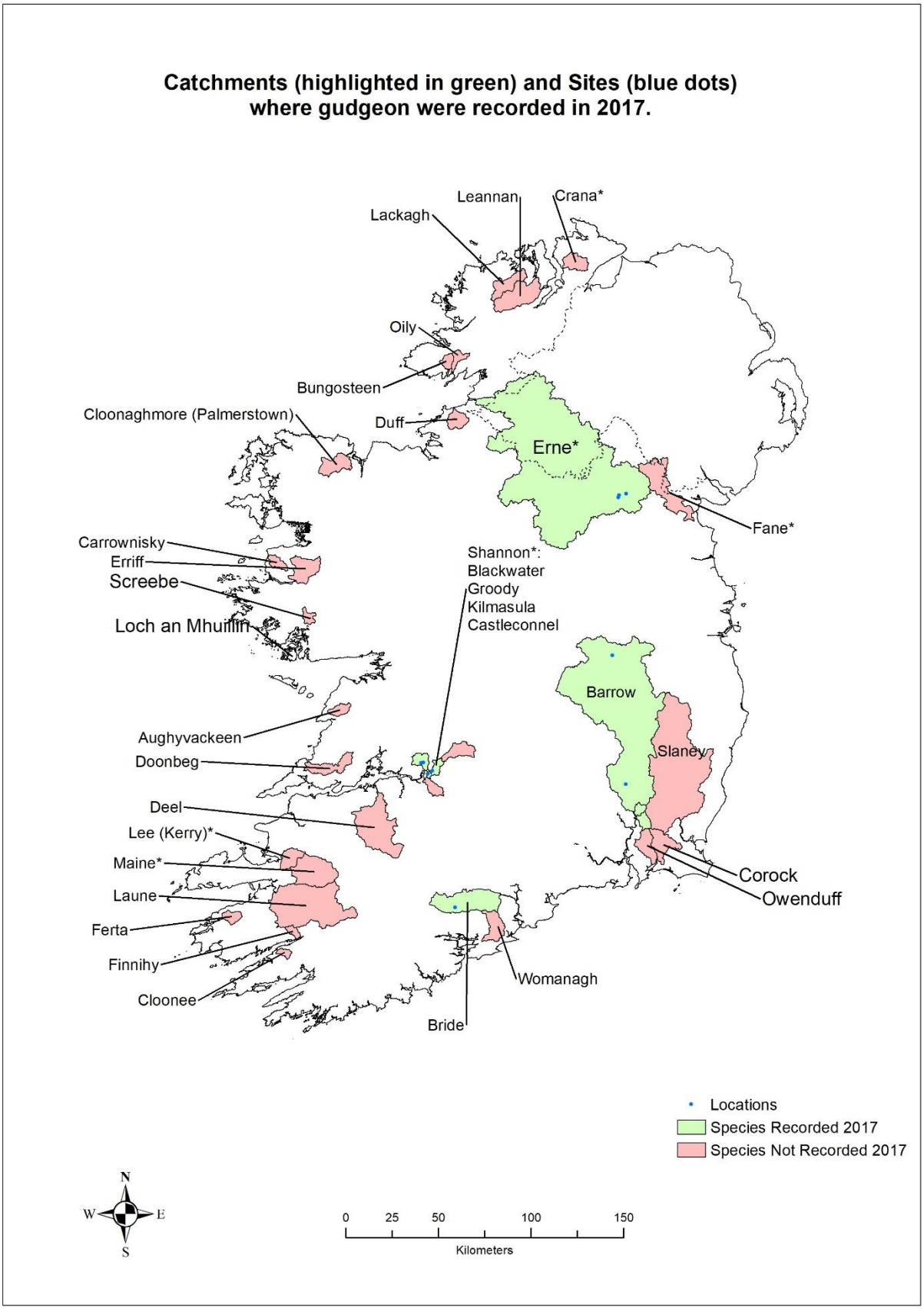
B.4. Eel


Catchments (highlighted in green) and Sites (blue dots)
where European eel were recorded in 2017.
Leannan
Crana*
Lackagh
Oily
Bungosteen
Cloonaghmore (Palmerstown)
Duff
Erne*
Fane*
Carrownisky
Erriff
Screebe
Loch an Mhuilinn
Shannon*:
Blackwater
Groody
Kilmasula
Castleconnel
Barrow
Slaney
Aughyvackeen
Doonbeg
Deel
Lee (Kerry)*
Maine*
Laune
Ferta
Finnihy
Cloonee
Corock
Owenduff
Womanagh
Bride
Locations
Species Recorded 2017
Species Not Recorded 2017
N
W
E
S
0
25
50
100
150
Kilometers

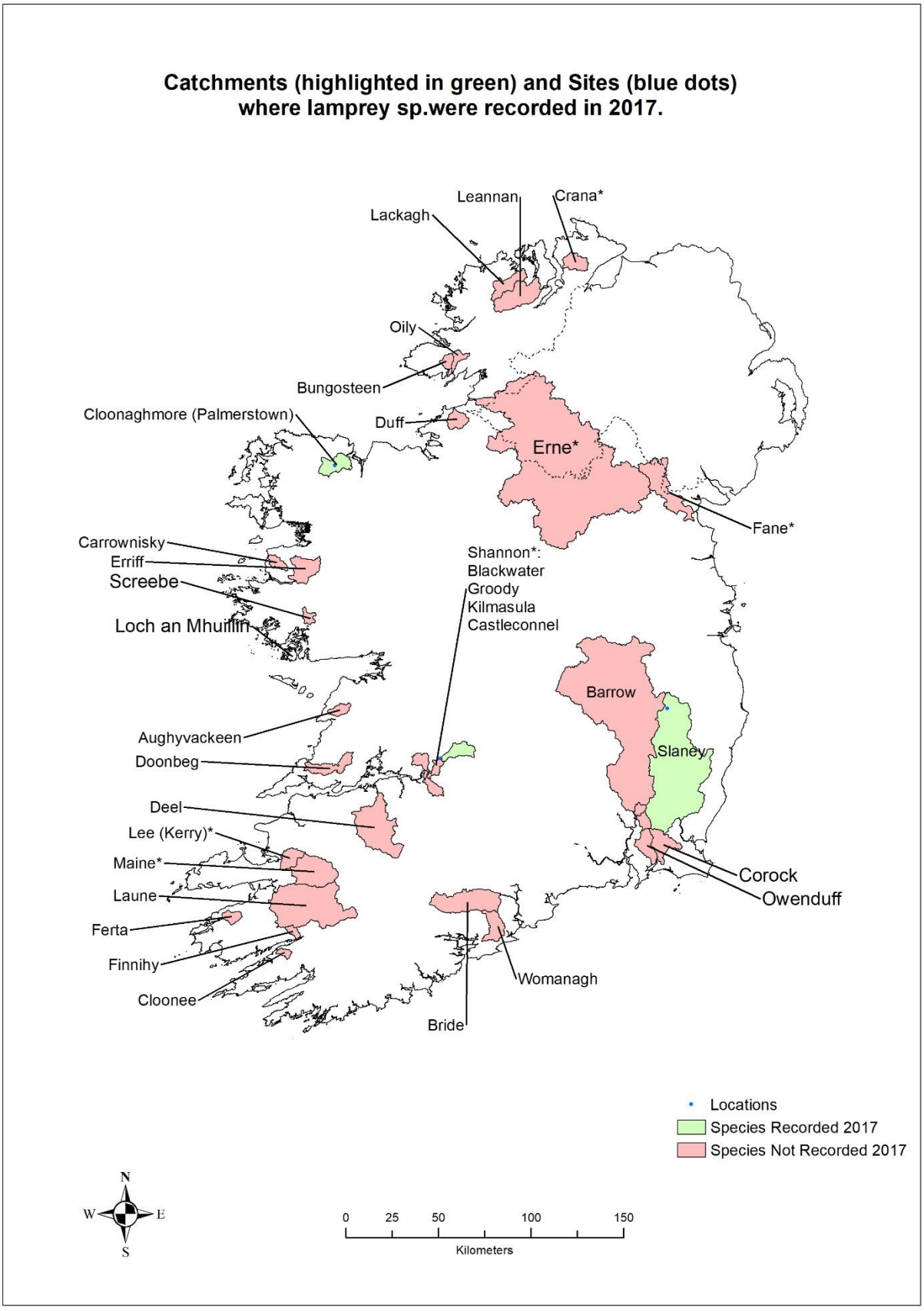
B.5. Flounder


Catchments (highlighted in green) and Sites (blue dots)
where flounder were recorded in 2017.
Leannan
Crana*
Lackagh
Oily
Bungosteen
Cloonaghmore (Palmerstown)
Duff
Erne*
Fane*
Carrownisky
Erriff
Screebe
Loch an Mhuilinn
Shannon*:
Blackwater
Groody
Kilmasula
Castleconnel
Barrow
Slaney
Aughyvackeen
Doonbeg
Deel
Lee (Kerry)*
Maine*
Laune
Ferta
Finnihy
Cloonee
Corock
Owenduff
Womanagh
Bride
Locations
Species Recorded 2017
Species Not Recorded 2017
N
W
E
S
0
25
50
100
150
Kilometers

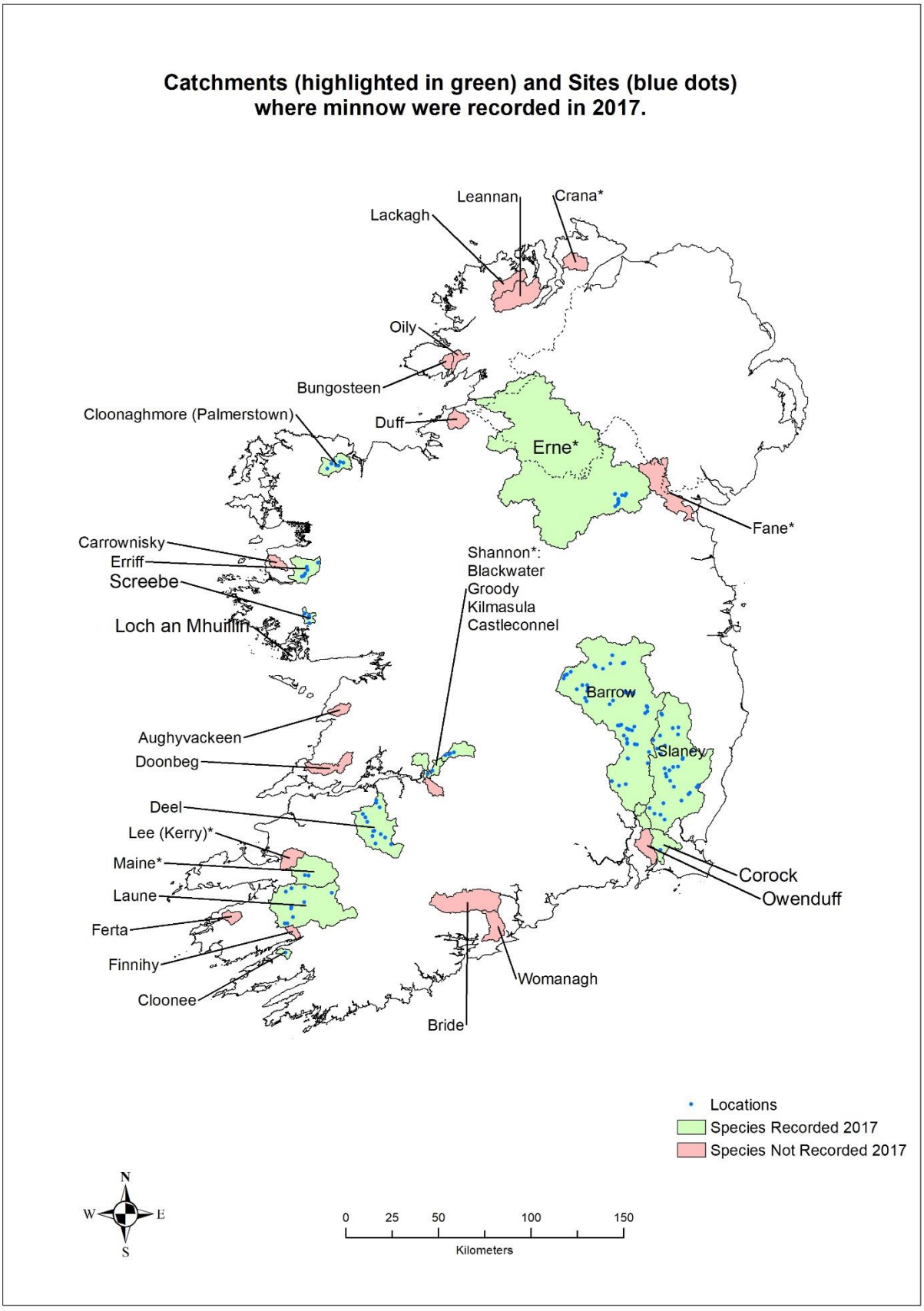
B.6. Gudgeon


Catchments (highlighted in green) and Sites (blue dots)
where gudgeon were recorded in 2017.
Leannan
Crana*
Lackagh
Oily
Bungosteen
Cloonaghmore (Palmerstown)
Duff
Erne*
Fane*
Carrownisky
Erriff
Screebe
Loch an Mhuilinn
Shannon*:
Blackwater
Groody
Kilmasula
Castleconnel
Barrow
Slaney
Aughyvackeen
Doonbeg
Deel
Lee (Kerry)*
Maine*
Laune
Ferta
Finnihy
Cloonee
Corock
Owenduff
Womanagh
Bride
Locations
Species Recorded 2017
Species Not Recorded 2017
N
W
E
S
0
25
50
100
150
Kilometers

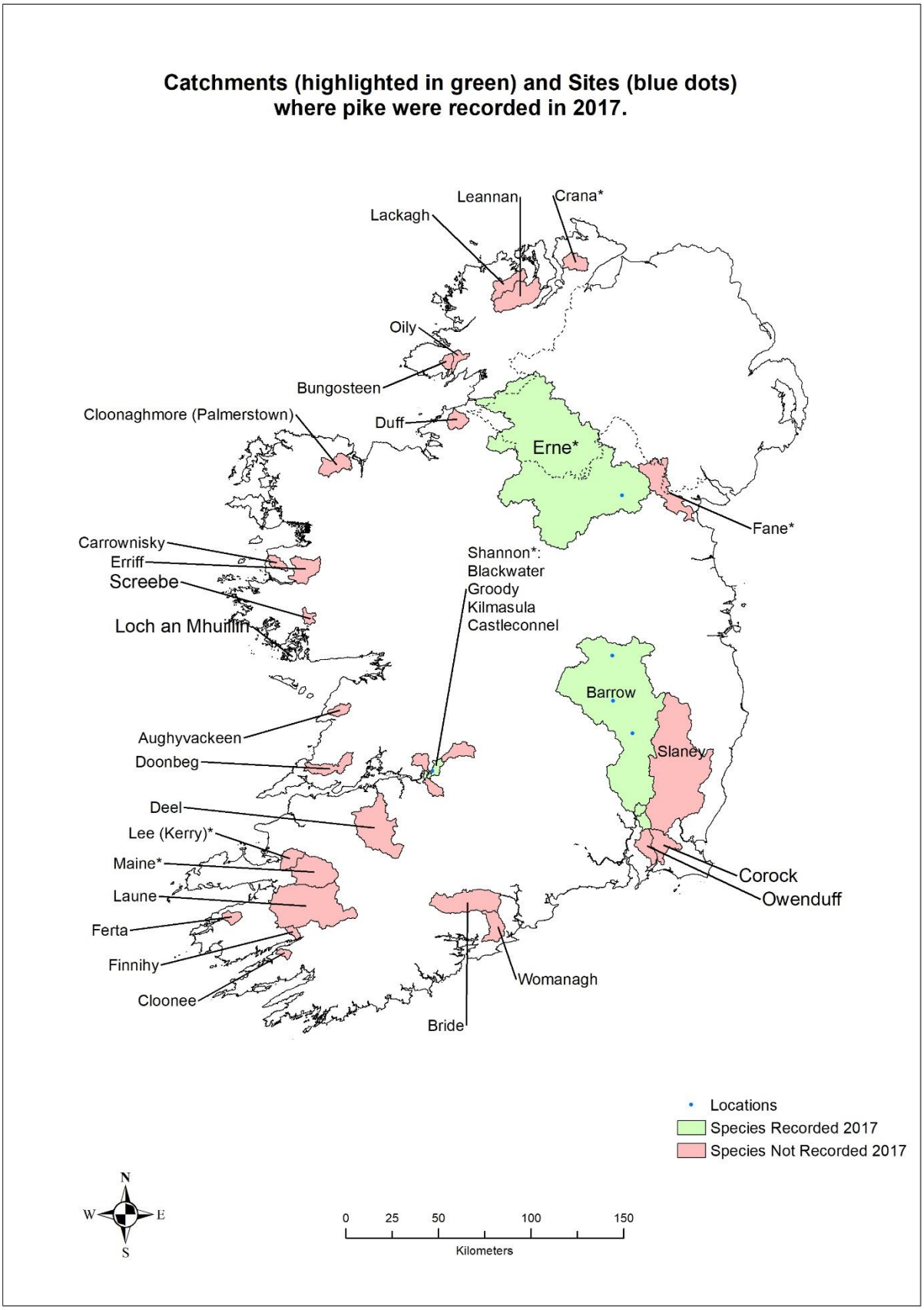
B.7. Lamprey Spp.



B.8. Minnow

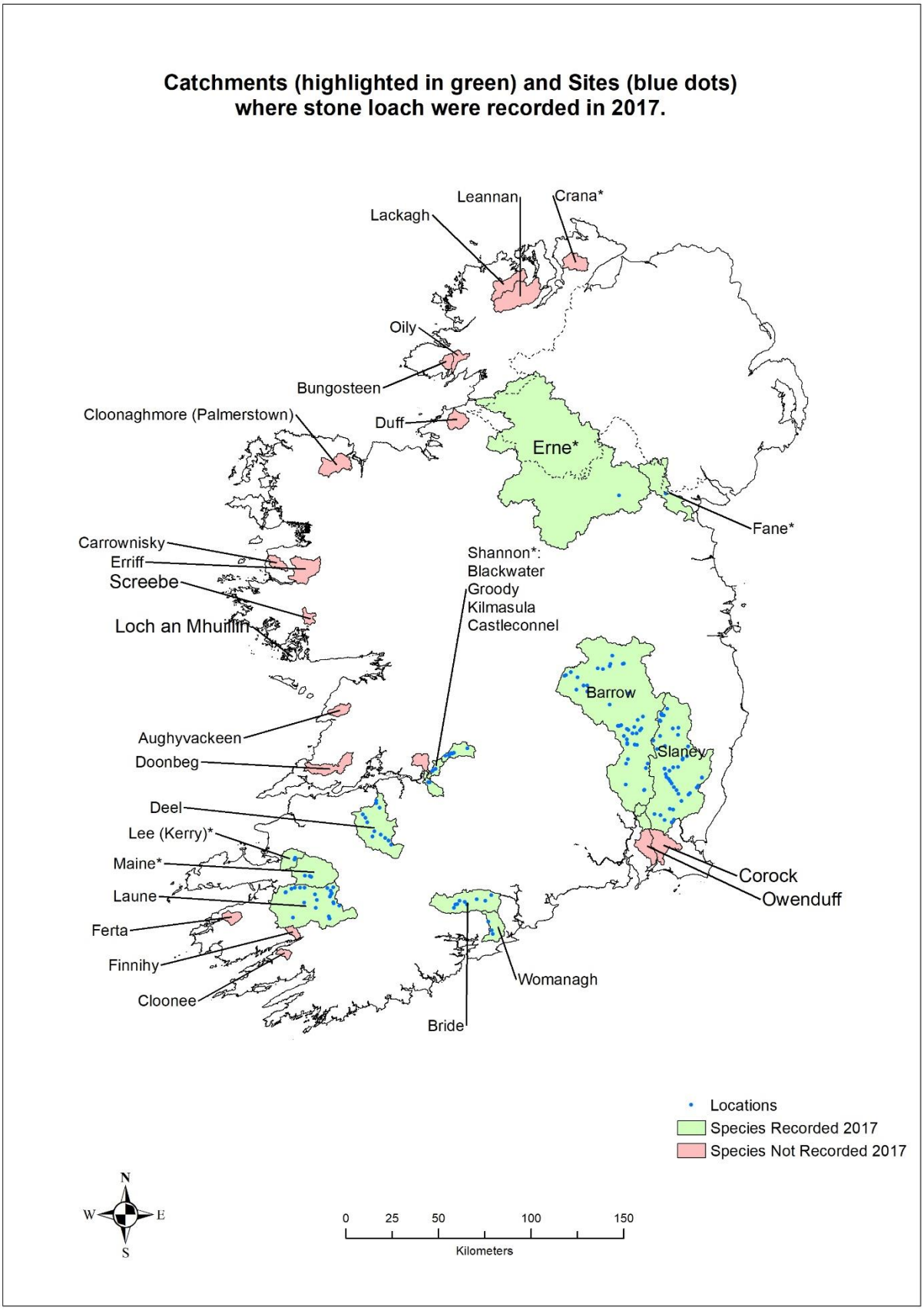

Catchments (highlighted in green) and Sites (blue dots)
where minnow were recorded in 2017.
Leannan
Crana*
Lackagh
Oily
Bungosteen
Cloonaghmore (Palmerstown)
Duff
Erne*
Fane*
Carrownisky
Erriff
Screebe
Loch an Mhuilinn
Shannon*:
Blackwater
Groody
Kilmasula
Castleconnel
Barrow
Slaney
Aughyvackeen
Doonbeg
Deel
Lee (Kerry)*
Maine*
Laune
Ferta
Finnihy
Cloonee
Corock
Owenduff
Womanagh
Bride
Locations
Species Recorded 2017
Species Not Recorded 2017
N
W
E
S
0
25
50
100
150
Kilometers

B.9. Pike

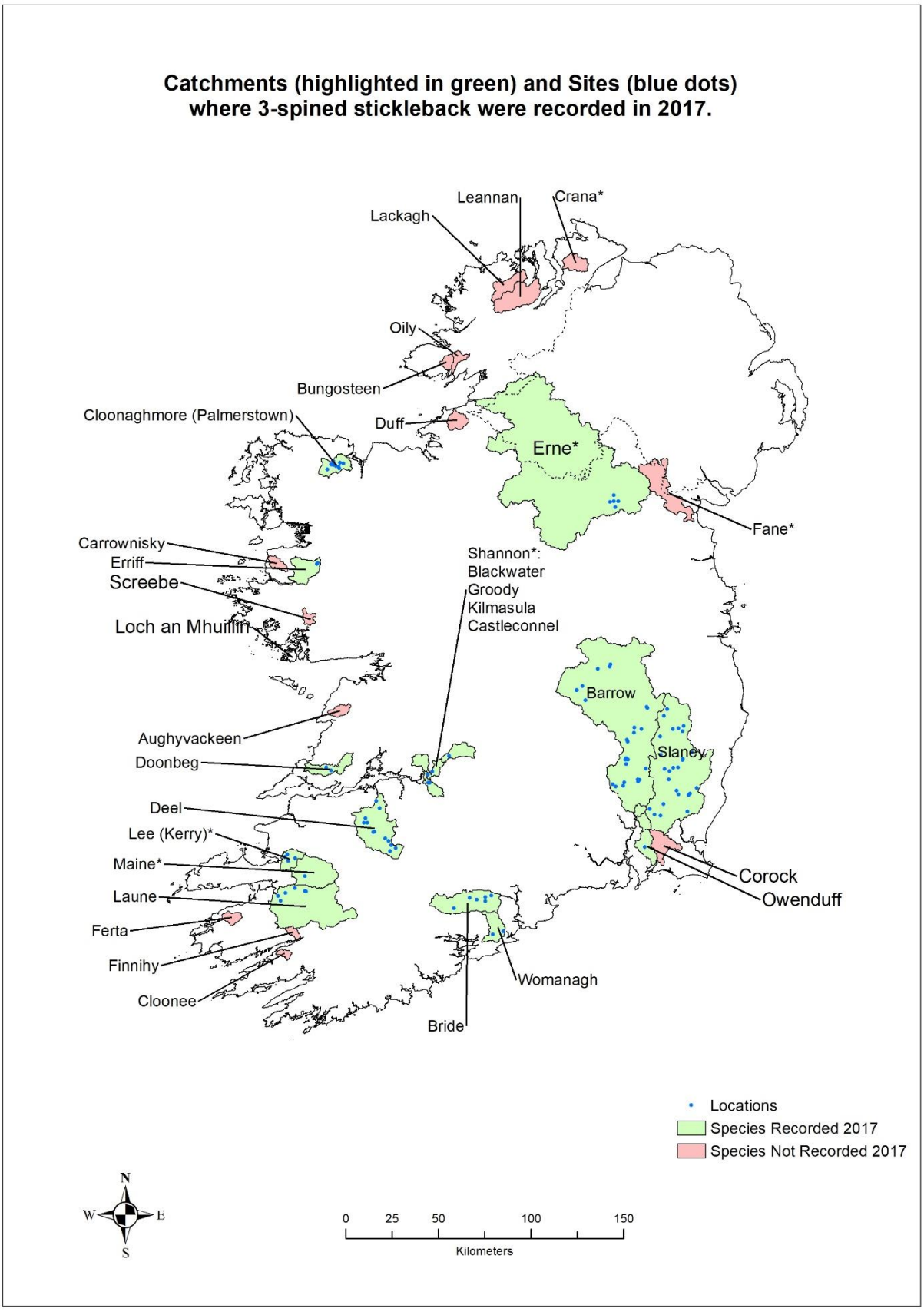


B.10. Roach

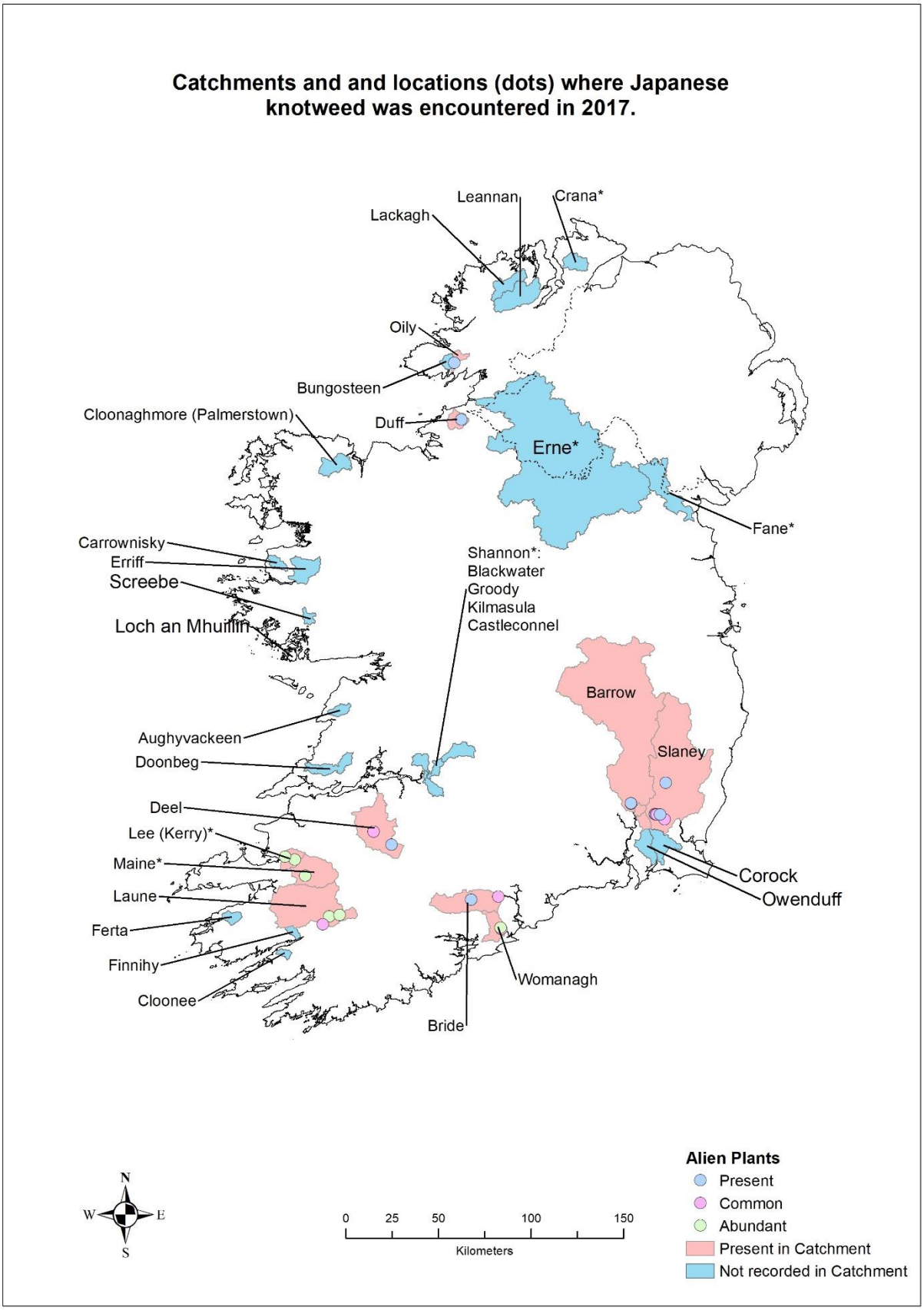
B.11. Stone Loach



B.12. Three-Spined Stickleback.

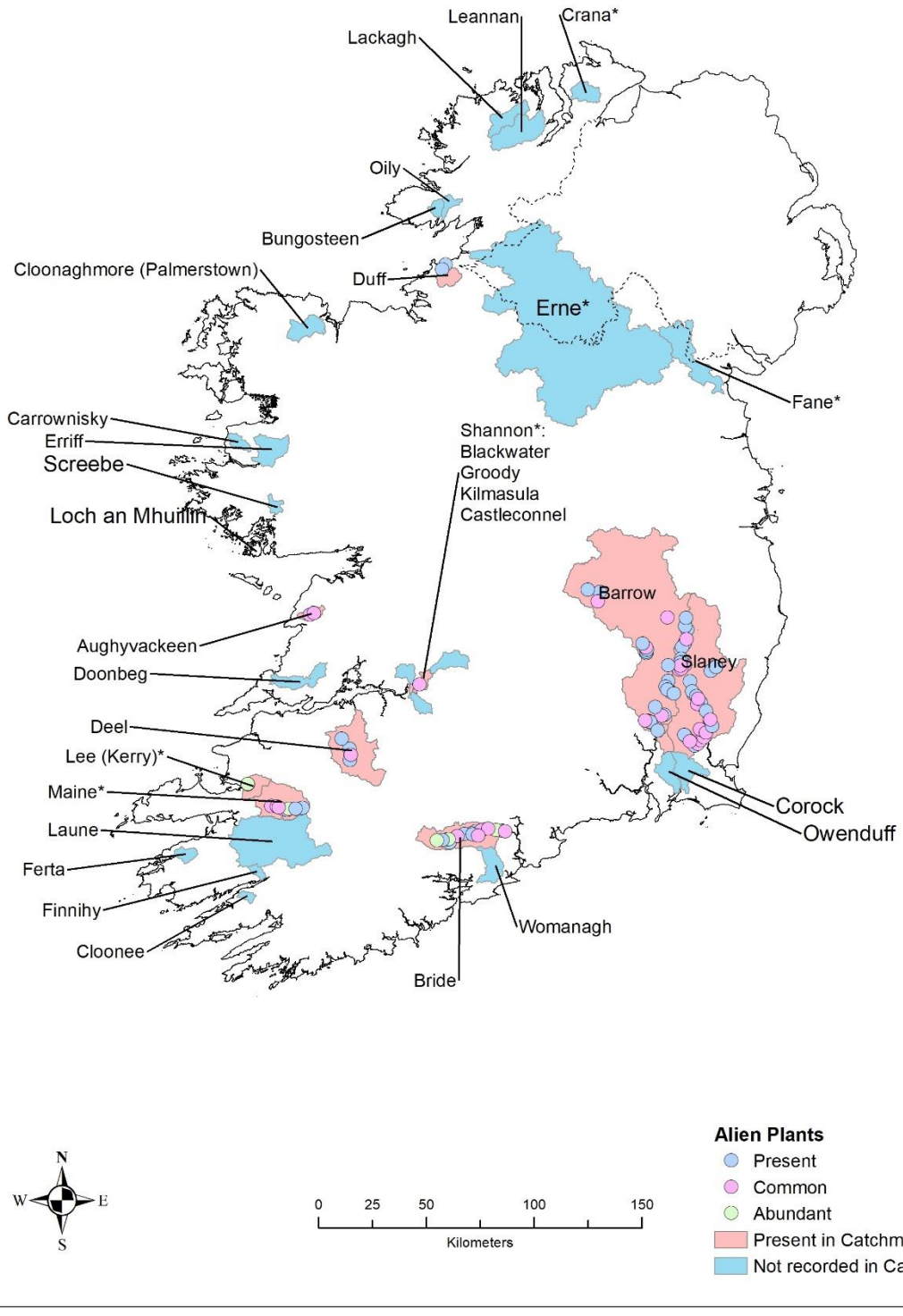


B.13. Japanese Knotweed.



B.14. Himalayan Balsam

Catchments (highlighted in red) and sites (coloured dots) where Himalayan balsam was recorded in 2017.



C. Annual CWEF results and averages to date.

	Fry Year											Most recent 5 surveys		Most Recent 5yrs Data (2013-2017)	
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	CWEF	#Surveys	CWEF	#Surveys
002/Flurry				5.24					17.15			11.20	2	17.15	1
003/Castletown			26.41				22.96	13.59				20.99	3	18.28	2
004/Fane			16.17			22.09			8.94*		0.50*	19.13	2		
005/Glyde		2.49	17.08	31.61					5.56			14.19	4	5.56	1
006/Dee		8.55	16.92	21.72	20.13				10.51			15.57	5	10.51	1
008/Boyne		23.91	17.54	29.38				13.21		14.37		17.28	5	13.79	2
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				6.75		20.32	5	6.75	1
015/Liffey Upper		12.93	5.11	8.15	16.20	10.13				2.63*		10.50	5		
016/Dodder					13.93							13.93	1		
018/Dargle			1.40	2.53	7.52				4.19			3.91	4	4.19	1
021/Vartry		10.00	15.11	2.54	15.07				5.34	1.75		7.96	5	3.55	2
026/Avoca		3.79	5.56	5.20	18.88	5.15				1.89		7.34	5	1.89	1
028/Owenavorragh				19.76			0.33		4.61			8.23	3	2.47	2
031/Slaney	19.05		15.94	18.42				17.68		8.70	14.30	15.01	5	13.56	3
032/Duncormick								11.54*							
033/Corock					37.11					5.47	1.23	14.60	3	3.35	2
034/Owenduff (Wexford)				4.97	10.65	15.91				3.47	0.40	7.08	5	1.94	2
037/Barrow	17.72		10.93	8.71	21.23	26.72				8.93*	11.54	15.83	5	11.54	1
038/Nore				18.83						11.77		15.30	2	11.77	1
043/Suir										10.27		10.27	1	10.27	1
050/Mahon		2.11						10.72	3.92			5.58	3	7.32	2
051/Tay					8.75				3.07	1.40		4.41	3	2.24	2
053/Colligan					29.32			9.50		3.62		14.15	3	6.56	2
055/Lickey		12.37							14.14			13.26	2	14.14	1
059/Blackwater (Munster)	22.72	10.67								13.56		15.65	3	13.56	1
060/Bride		10.40		24.70				19.85			7.65	15.65	4	13.75	2
061/Tourig						9.40						9.40	1		
062/Womanagh		15.45						2.39			1.43	6.42	3	1.91	2
064/Owennacurra	15.76											15.76	1		
066/Lower Lee (Cork)			0.26									0.26	1		
069/Bandon										11.01		11.01	1	11.01	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	2.67	2

*- Partial or incomplete surveys not included in calculation of CWEF average

Code/River	Fry Year											Most recent 5 surveys		Most Recent 5yrs Data (2013-2017)	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	CWEF	#Surveys	CWEF	#Surveys
082/Kealincha	0.00								0.00			0.00	2	0.00	1
083/Lough Fada	3.23								1.68			2.46	2	1.68	1
084/Croanshagh										23.38		23.38	1	23.38	1
085/Owenshagh							4.32		6.73			5.53	2	5.53	2
086/Cloonee						16.18	33.06				24.09	24.44	3	28.58	2
088/Roughty					19.78							19.78	1		
089/Finnihy						8.61	0.00				0.58	3.06	3	0.29	2
090/Blackwater (Kerry)	30.54	15.52	13.35					18.01				19.36	4	18.01	1
093/Owreagh	8.94						2.07	2.81				4.61	3	2.44	2
097/Currane								24.51		38.17*		24.51	1	24.51	1
098/Inny	24.63		19.78									22.21	2		
099/Emlaghmore	2.07								1.45			1.76	2	1.45	1
101/Carhan	15.76						6.05	8.61				10.14	3	7.33	2
102/Ferta	19.42							10.74			6.88	12.35	3	8.81	2
103/Behy	15.41	6.14	4.03	8.71	7.17					2.89		5.79	5	2.89	1
106/Laune		17.42*									21.41	21.41	1	21.41	1
107/Maine	31.88	32.81	34.23*								22.05*	32.34	3		
108/Emlagh	10.37	3.66	13.38	3.84	2.59					2.10		5.11	5	2.10	1
109/Owenascaul	20.41		22.27				16.08	16.28				18.76	4	16.18	2
110/Owenalondrig			21.90									21.90	1		
111/Milltown (Kerry)		15.33		26.44			13.02		8.76			15.89	4	10.89	2
112/Feohanagh			16.61				3.20	11.93				10.58	3	7.57	2
114/Owenmore (Kerry)	25.07											25.07	1		
115/Scorid										1.86		1.86	1	1.86	1
115/Glenahoo										1.87		1.87	1	1.87	1
116/Aghacashla										4.89		4.89	1	4.89	1
116/Owenamallagh										0.00		0.00	1	0.00	1
116/Meennascarty										0.00		0.00	1	0.00	1
117/Lee (Kerry)		0.67						0.68			0.69*	0.68	2	0.68	1
118/Brick	0.00											0.00	1		
119/Feale							24.15					24.15	1	24.15	1
120/Galey			12.99									12.99	1		
125/Deel					0.18			0.23		1.96*	0.04	0.15	3	0.14	2
126/Maigue			2.82	16.05			12.05					10.31	3	12.05	1
128/Shannon Kilcrow				0.69								0.69	1		
128/Shannon Graney				0.19								0.19	1		
128/Shannon Woodford				0.00								0.00	1		
128/Shannon Blackwater											10.74*				
128/Shannon Groody											0.00*				

*- Partial or incomplete surveys not included in calculation of CWEF average

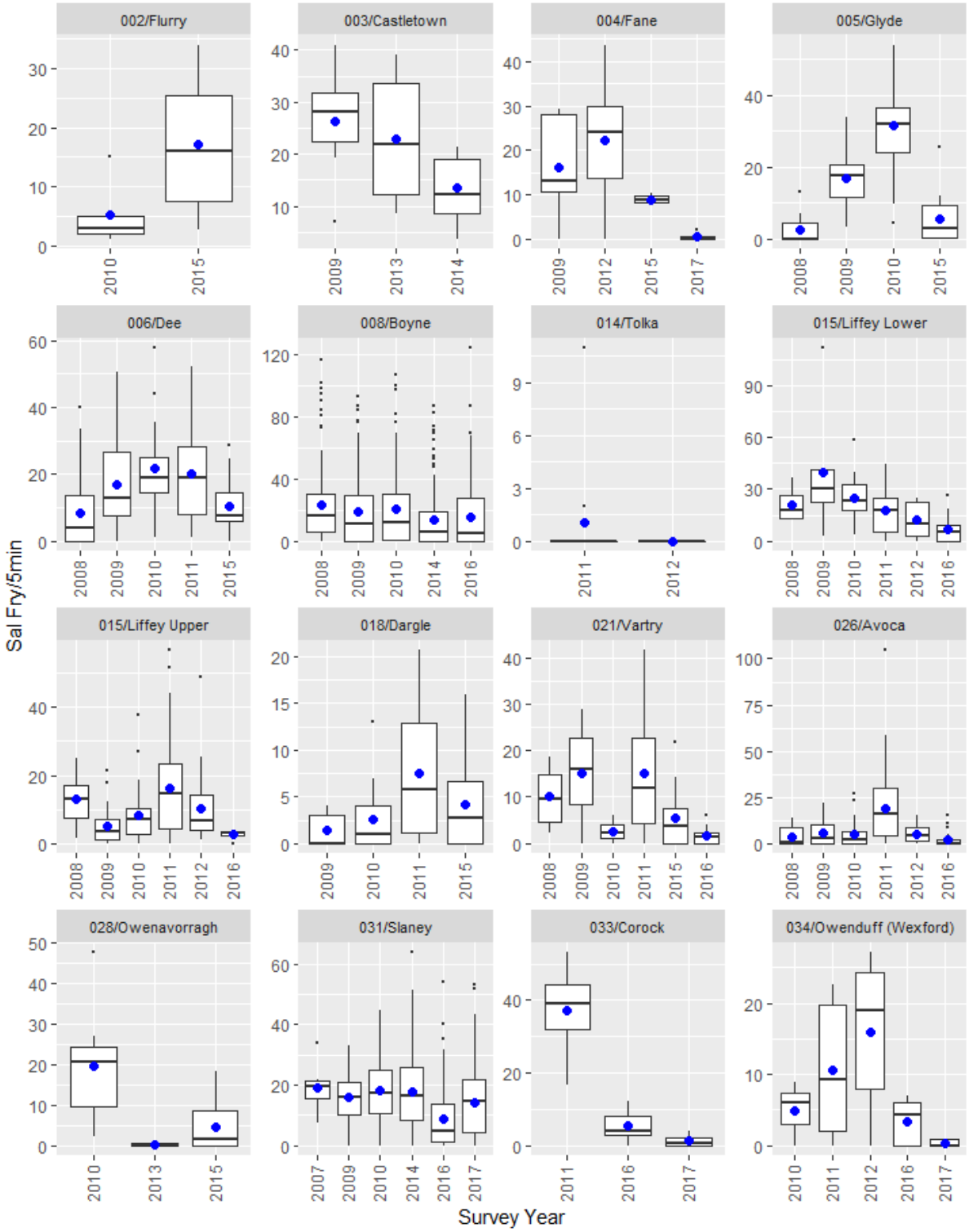
Code/River	Fry Year											Most recent 5 surveys		Most Recent 5yrs Data (2013-2017)	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	CWEF	#Surveys	CWEF	#Surveys
128/Shannon Kilmastula											10.35*				
128/Shannon Old Main Channel											5.50*				
Quin									6.47			6.47	1	6.47	1
130/Owenagarney (Ratty)							16.97	9.97				13.47	2	13.47	2
131/Fergus	12.96		4.10	6.84			5.89		6.66			7.29	5	6.28	2
133/Doonbeg				12.28				17.39		16.14*	18.77	16.15	3	18.08	2
134/Skivaleen					14.82				11.70	14.54*		13.26	2	11.70	1
135/Annageeragh							1.82	9.24				5.53	2	5.53	2
142/Inagh								5.31	3.59			4.45	2	4.45	2
143/Aughyvackeen					1.00						1.70	1.35	2	1.70	1
145/Kilcolgan			2.51									2.51	1		
146/Clarinbridge					7.26							7.26	1		
148/Knock					12.53							12.53	1		
149/Owenboliska (Spiddal)		4.06						4.52				4.29	2	4.52	1
Loch An Mhuillin											0.00			0.00	1
152/Cashla							10.83					10.83	1	10.83	1
154/L. Na Furnace stream									0.00			0.00	1	0.00	1
155/Screebe											10.70	10.70	1	10.70	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	21.72	13.69	23.26	5	23.26	5
171/Carrownisky		18.25				20.60	18.22				4.25*	19.02	3	18.22	1
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					17.40				13.00	3	17.40	1
179/Srahmore			4.33									4.33	1		
181/Owengarve			5.51					6.19	0.72			4.14	3	3.46	2
185/Owenduff (Bangor)			6.00					6.20				6.10	2	6.20	1
186/Owenmore - MC							27.65					27.65	1	27.65	1
186/Owenmore- Carrowmore (Muinhin)							25.77					25.77	1	25.77	1
187/Glenamoy	28.16		5.65									16.91	2		
188/Muingnabo	0.78								1.88			1.33	2	1.88	1
193/Ballinglen	10.65				15.09		6.37			4.97		9.27	4	5.67	2
194/Cloonaghmore (Palmerstown)		8.96		9.71	22.27	17.32	15.02				5.07*	14.66	5	15.02	1
196/Brusna			4.70				14.16	14.74				11.20	3	14.45	2
198/Leaffony	5.76		7.95						1.87			5.19	3	1.87	1
203/Garvogue (Bonnet)	18.41	13.26	16.83	11.31	7.08	18.54						13.40	5		
205/Drumcliff				17.72								17.72	1		
207/Grange	5.75		3.29						4.56			4.53	3	4.56	1

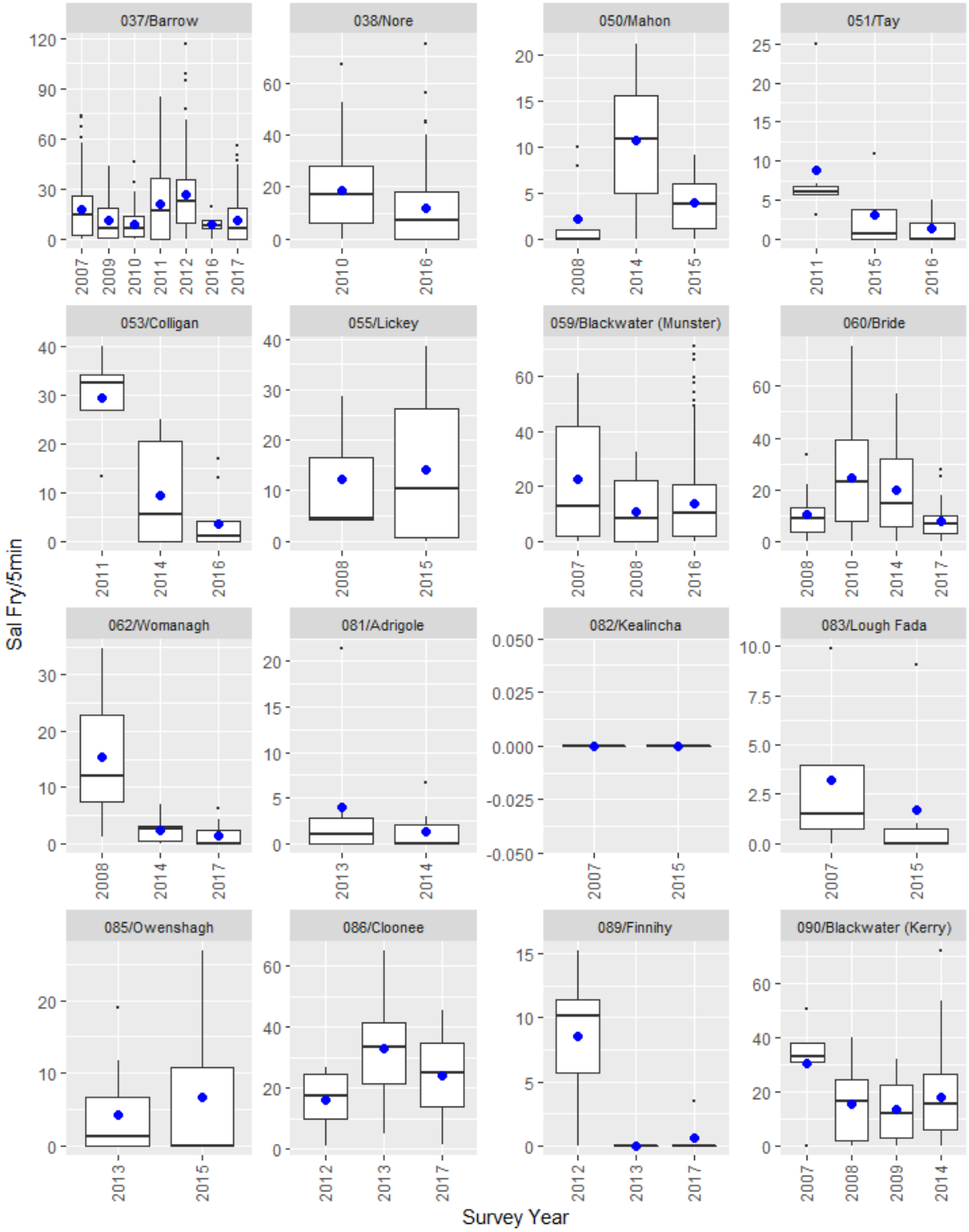
*- Partial or incomplete surveys not included in calculation of CWEF average

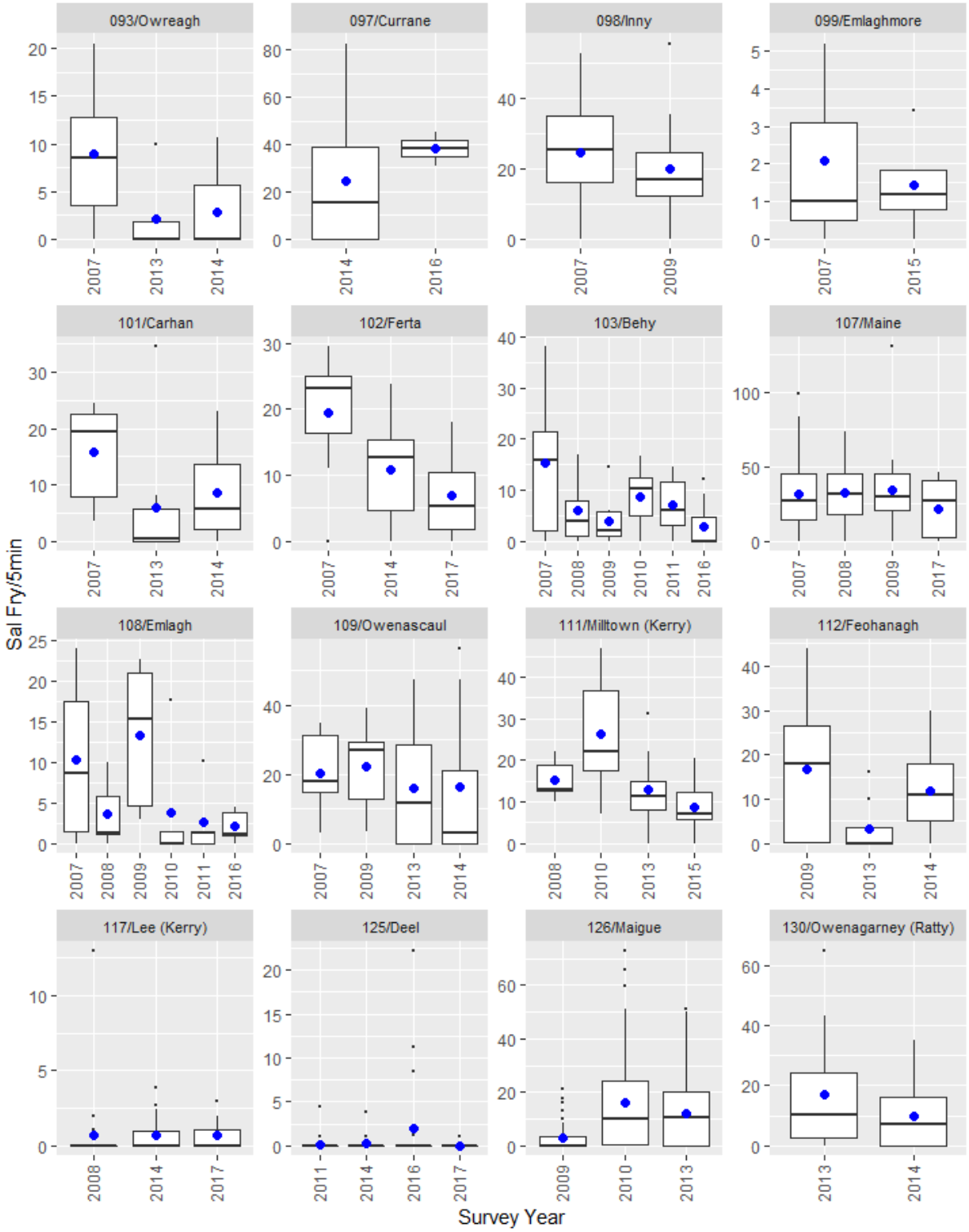
Code/River	Fry Year											Most recent 5 surveys		Most Recent 5yrs Data (2013-2017)	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	CWEF	#Surveys	CWEF	#Surveys
208/Duff	7.84	9.31	18.59	25.16							18.05	15.79	5	18.05	1
210/Erne		7.37	0.17	0.08	0.00	0.00	0.00	1.60	1.16	1.25	0.00	0.80	5	0.80	5
211/Abbey							7.20	28.14				17.67	2	17.67	2
212/Ballintra			10.27				13.40	18.30				13.99	3	15.85	2
213/Laghy			8.58				14.97	11.02				11.52	3	13.00	2
214/Eske		13.10	16.99	16.30					13.45			14.96	4	13.45	1
215/Eany				15.86		30.08			12.89			19.61	3	12.89	1
216/Oily			9.49		33.68			16.62			21.26	20.26	4	18.94	2
217/Bungosteen					27.91		19.23				13.17	20.10	3	16.20	2
219/Glen (Ballyshannon)				19.44					18.37			18.91	2	18.37	1
220/Owenwee (Yellow R)	24.13	5.00	14.81			20.31	19.65					16.78	5	19.65	1
221/Bracky		10.82				21.57		12.24				14.88	3	12.24	1
222/Owentocker		20.06										20.06	1		
226/Owenamarve			3.76				2.64	1.00				2.47	3	1.82	2
228/Gweedore (Crolly R.)		15.99			11.32							13.66	2		
229/Clady		16.12				37.21						26.67	2		
234/Glenna			16.80		3.77		7.77			4.00		8.09	4	5.89	2
235/Tullaghobegly		8.33		9.05						0.00*		8.69	2		
236/Ray		6.43			14.89			17.31		3.71*		12.88	3	17.31	1
240/Lackagh		18.86	15.82		19.20	23.57				17.50*	22.50	19.99	5	22.50	1
248/Leannan	9.47	7.41	8.73	16.71	12.36	21.51	19.51	20.87	15.27	15.05*	18.66	19.16	5	18.58	4
249/Swilly		9.33	7.36				18.08	8.05				10.71	4	13.07	2
250/Isle (Burn)						2.12						2.12	1		
251/Burnfoot		7.77		2.90								5.34	2		
252/Mill (Letterkenny)				0.00					0.00			0.00	2	0.00	1
253/Crana			15.74							6.00*	5.78*	15.74	1		
256/Clonmany		16.61		6.59					4.21			9.14	3	4.21	1
257/Straid				0.20					0.00			0.10	2	0.00	1
258/Donagh				4.25					0.68			2.47	2	0.68	1
259/Glennagannon			16.65		4.05		7.13					9.28	3	7.13	1
261/Culoort				4.03					0.00			2.02	2	0.00	1

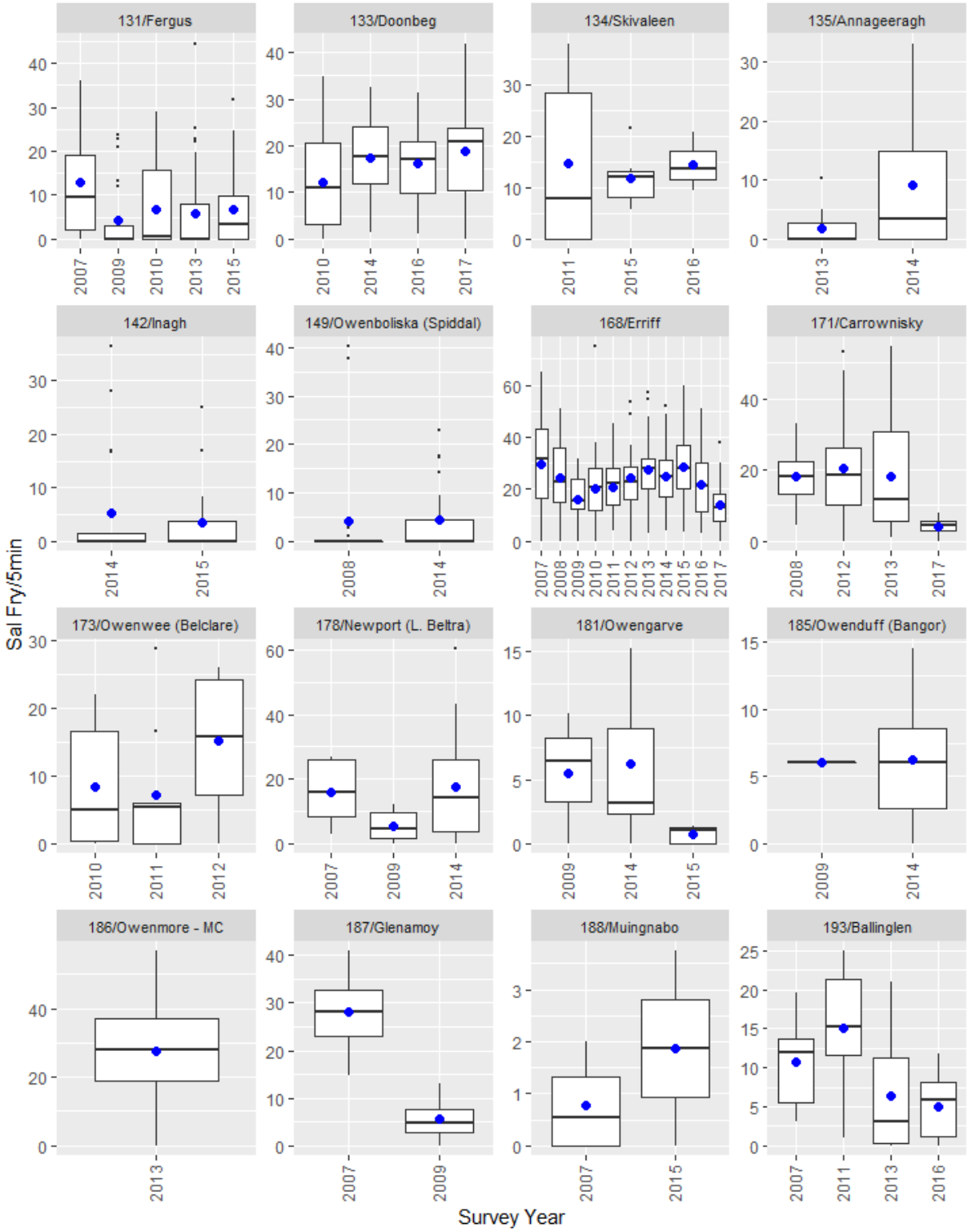
*- Partial or incomplete surveys not included in calculation of CWEF average

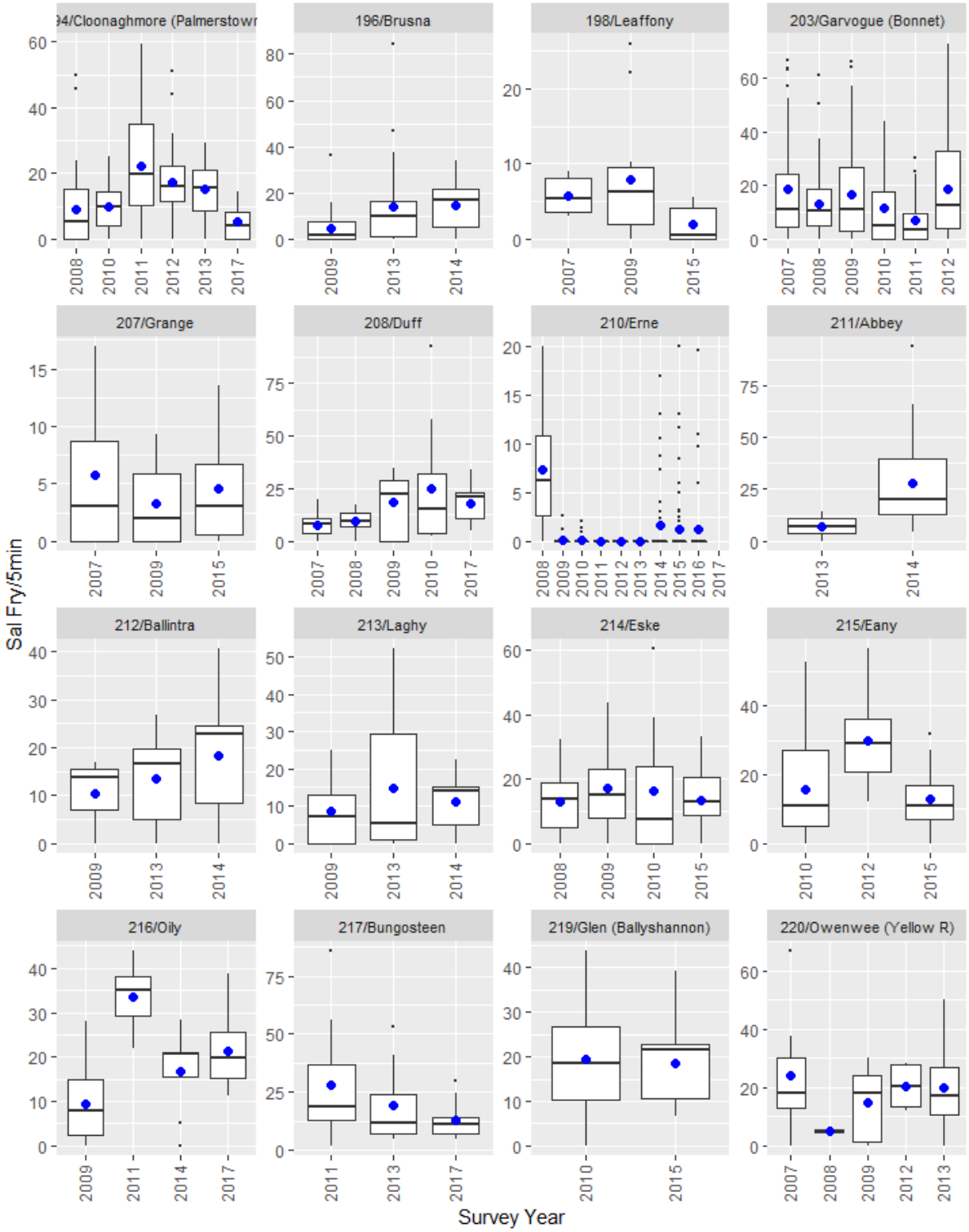
D. Boxplots: CWEF results included in analysis for each catchment >2 surveys from 2007-2017

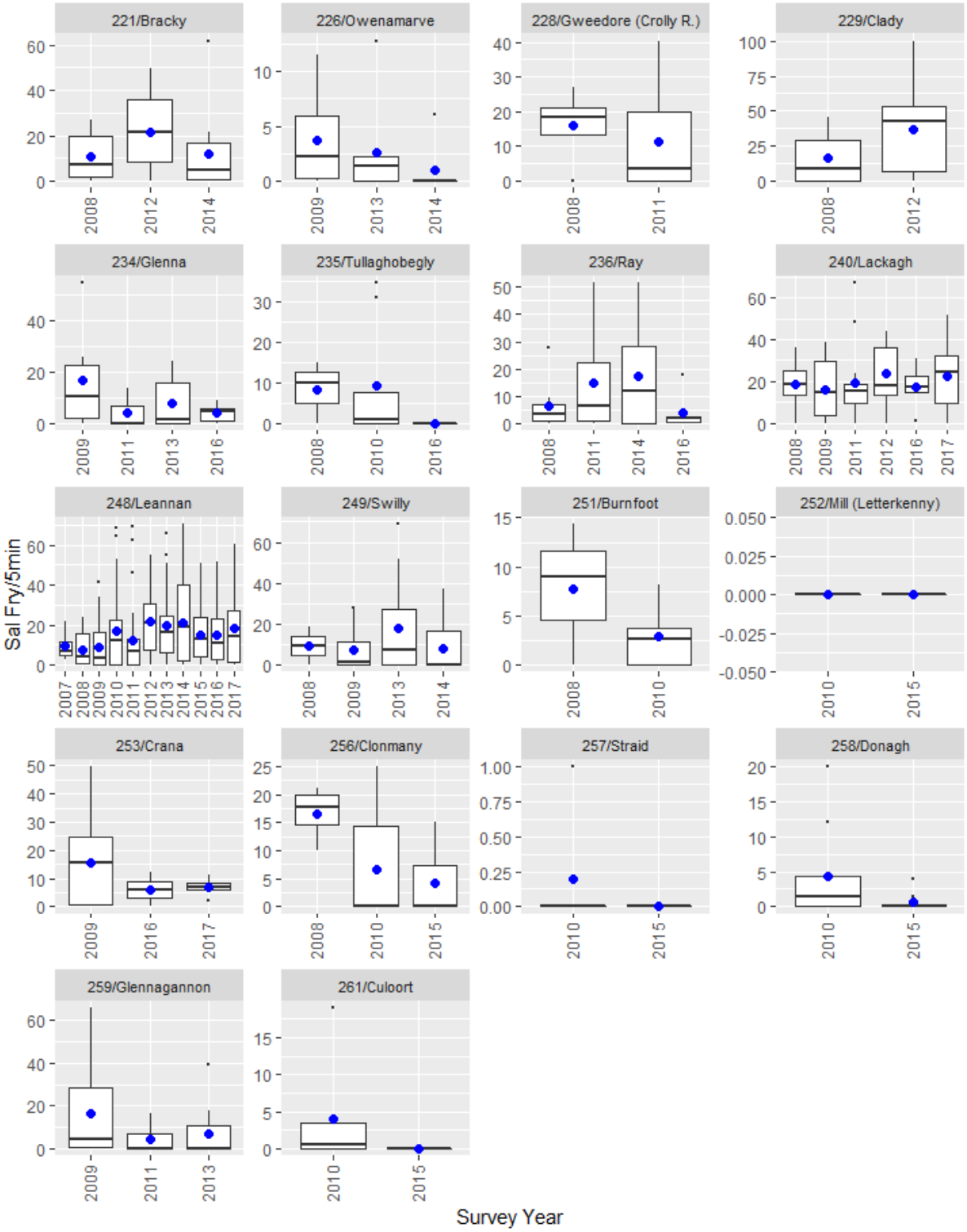



037/Barrow
038/Nore
050/Mahon
051/Tay
053/Colligan
055/Lickey
059/Blackwater (Munster)
060/Bride
062/Womanagh
081/Adrigole
082/Kealincha
083/Lough Fada
085/Owenshagh
086/Cloonee
089/Finnihy
090/Blackwater (Kerry)
Sal Fry/5min
Survey Year


093/Owreagh
097/Currane
098/Inny
099/Emlaghmore
101/Carhan
102/Ferta
103/Behy
107/Maine
108/Emlagh
109/Owenascaul
111/Milltown (Kerry)
112/Feohanagh
117/Lee (Kerry)
125/Deel
126/Maigue
130/Owenagarney (Ratty)
Sal Fry/5min
Survey Year


131/Fergus
133/Doonbeg
134/Skivaleen
135/Annageeragh
142/Inagh
149/Owenboliska (Spiddal)
168/Erriff
171/Carrownisky
173/Owenwee (Belclare)
178/Newport (L. Beltra)
181/Owengarve
185/Owenduff (Bangor)
186/Owenmore - MC
187/Glenamoy
188/Muingnabo
193/Ballinglen
Sal Fry/5min
Survey Year


94/Cloonaghmore (Palmerstown
196/Brusna
198/Leaffony
203/Garvogue (Bonnet)
207/Grange
208/Duff
210/Erne
211/Abbey
212/Ballintra
213/Laghy
214/Eske
215/Eany
216/Oily
217/Bungosteen
219/Glen (Ballyshannon)
220/Owenwee (Yellow R)
Sal Fry/5min
Survey Year


221/Bracky
226/Owenamarve
228/Gweedore (Crolly R.)
229/Clady
234/Glenna
235/Tullaghobegly
236/Ray
240/Lackagh
248/Leannan
249/Swilly
251/Burnfoot
252/Mill (Letterkenny)
253/Crana
256/Clonmany
257/Straid
258/Donagh
259/Glennagannon
261/Culoort
Sal Fry/5min
Survey Year

E. Survey Density

Table D.1: Approximate calculated river lengths and survey densities for all CWEF surveys.

IFI Code/ River	2 km per Site	5 km per Site	Length >SO1 (Km)	Km/Site Achieved										
				2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Min
2/Flurry	16	6	32.2			4.0					8.1			4.0
3/Castletown	15	6	30.8		2.4				2.8	2.8				2.4
4/Fane	55	22	110.6		15.8			7.9			10.1		22.1	7.9
5/Glyde	82	33	165.2	10.3	11.0	11.8					11.0			10.3
6/Dee	100	40	200.8	6.9	10.6	10.0	10.0				10.0			6.9
8/Boyne	555	222	1110.5	8.4	7.6	7.7				7.5		7.6		7.5
13/Broadmeadow	57	23	116.0			38.7								38.7
14/Tolka	41	16	82.3				6.9	41.2						6.9
15.1/Liffey Lower	60	24	121.8	20.3	20.3	11.1	7.2	17.4				7.2		7.2
15.2/Liffey Upper	206	82	412.4	24.3	12.9	11.1	7.6	15.9				103		7.6
16/Dodder	46	18	93.0				15.5							15.5
18/Dargle	38	15	77.4	38.7	12.9	4.3	4.8				4.6			4.3
21/Vartry	22	8	44.1	11.0	11.0	3.4	4.0				2.9	3.7		2.9
26/Avoca	172	68	344.6	16.4	11.1	13.3	4.3	11.5				7.7		4.3
28/Owenavorragh	47	18	94.7			13.5			15.8		5.3			5.3
31/Slaney	432	173	865.9	866	18.0	11.0				7.2		6.3	6.4	6.3
32/Duncormick	15	6	31.4							15.7				15.7
33/Corock	47	18	94.6			31.5	15.8	23.6				18.9	15.8	15.8
34/Owenduff (Wexford)	16	6	32.7			10.9	5.5	5.5				6.5	6.5	5.5
37/Barrow	547	219	1095.1		13.0	13.2	13.0	10.4				274	8.5	8.5
38/Nore	555	222	1110.5			10.8						9.3		9.3
43/Suir	825	330	1650.2									11.9		11.9
50/Mahon	32	12	64.1	6.4						8.0	8.0			6.4
51/Tay	20	8	41.1				6.8			41.1	8.2	5.9		5.9
53/Colligan	27	11	55.5				11.1			4.6		4.3		4.3
55/Lickey	9	3	19.7	4.9							2.2			2.2
59/Blackwater (Munster)	638	255	1277.9	67.3								4.0	85.2	4.0
60/Bride	80	32	160.7	7.7		6.2				4.3			4.1	4.1
61/Tourig	8	3	16.7					2.1						2.1
62/Womanagh	26	10	52.8	4.8						3.5			4.1	3.5
64/Owennacurra	32	13	65.6											4.4
66.1/Lee (Cork)	217	87	435.5		18.9									18.9
69/Bandon	154	61	309.0									3.2		3.2
72/Ilen	92	37	185.5					26.5						26.5
77/Mealagh	24	9	49.2					4.5						4.5
80/Glengarriff	22	8	44.5		4.9									4.9
81/Adrigole	17	7	35.0						3.9	3.2				3.2
82/Kealincha	11	4	23.8								4.8			4.8
83/Lough Fada	12	5	25.8								4.3			4.3
84/Croanshagh	27	10	54.5									4.2		4.2
85/Owenshagh	26	10	52.9						3.3		5.3			3.3
86/Cloonee	9	3	18.3					2.6	3.0				2.6	2.6
88/Roughty	99	39	198.8				15.3							15.3
89/Finnihy	11	4	22.1					3.7	3.7				3.7	3.7
90/Blackwater (Kerry)	40	16	80.8	6.2	5.8					1.9				1.9
93/Owreagh	8	3	17.4						2.9	2.2				2.2
97/Currane	38	15	77.7							1.4		6.5	6.5	1.4
98/Inny	42	17	85.1		4.3									4.3
99/Emlaghmore	7	2	15.0								3.7			3.7
101/Carhan	9	3	18.0						2.3	1.8				1.8
102/Ferta	17	6	34.4							2.6			2.2	2.2
103/Behy	14	5	28.2	2.8	2.8	3.1	2.8					2.6		2.6
106/Laune	269	107	540.0	45.0									4.9	4.9
107/Maine	93	37	187.3	3.6	11.0								7.5	3.6
108/Emlagh	10	4	20.1	4.0	4.0	4.0	4.0					4.0		4.0
109/Owenascaul	17	6	34.5		3.5				3.5	2.7				2.7
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	14	5	29.4		2.9				2.7	2.4				2.4
115.1/Scorid	5	2	10.6									2.1		2.1

Table D.1: Approximate calculated river lengths and survey densities for all CWEF surveys.

IFI Code/ River	2 km per Site	5 km per Site	Length >SO1 (Km)	Km/Site Achieved										
				2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Min
115.2/Glenahoo	5	2	12.0									1.2		1.2
116/Aghacashla	7	2	14.2									2.0		2.0
116.1/Owenamallagh	2	0	4.6									2.3		2.3
116.2/Meennascarty	4	1	8.5									2.1		2.1
117/Lee (Kerry)	43	17	87.6	2.6						4.6			6.7	2.6
119/Feale	167	67	335.7						5.7					5.7
120/Galey	167	67	335.7		10.5									10.5
125/Deel	125	50	251.2				2.5			2.4		10.5	8.7	2.4
126/Maigue	209	83	418.3		6.5	4.8			3.0					3.0
128.01/Shan. Kilcrow	96	38	193.1			3.4								3.4
128.02/Shan. Graney	77	31	155.6			2.5								2.5
128.03/Shan. Woodford	13	5	27.9			1.9								1.9
128.06/Shan. Blackwater	15	6	31.8										1.6	1.6
128.07/Shan. Groody	17	6	34.1										2.6	2.6
128.08/Shan. Kilmastula	32	12	65.0										3.8	3.8
128.09/Shan. Old MC	11	4	23.6										4.7	4.7
130/Owenagarney (Ratty)	44	17	89.3						3.0	3.9				3.0
131/Fergus	116	46	233.2		6.5	6.0			3.2		4.4			3.2
133/Doonbeg	34	13	69.1			2.6				3.3		5.8	4.3	2.6
134/Skivaleen	14	5	29.9				2.5				3.0	7.5		2.5
135/Annageeragh	17	7	35.6						2.0	2.0				2.0
142/Inagh	60	24	120.7							4.0	5.2			4.0
143/Aughyvackeen	17	6	34.8				2.0						1.7	1.7
145/Kilcolgan	81	32	162.5		4.6									4.6
146/Clarinbridge	20	8	41.9				6.0							6.0
148/Knock	9	3	19.9				3.3							3.3
149/Owenboliska(Spiddal)	29	11	58.1	2.2						2.8				2.2
152/Cashla	24	9	49.0						1.5					1.5
154/L. Na Furnace stream	5	2	11.7								2.9			2.9
155/Screeb	9	3	19.0										0.9	0.9
163/Owenglin	19	7	39.5		2.1									2.1
167/Culfin	10	4	21.2	3.0										3.0
168/Erriff	70	28	141.8	2.9	2.7	2.8	4.1	4.1	4.2	4.1	3.8	4.3	4.3	2.7
171/Carrownisky	20	8	41.7	2.1				2.2	2.5				10.4	2.1
172/Bunowen	34	13	69.7		23.2									23.2
173/Owenwee (Belclare)	20	8	41.4			3.8	4.6	3.8						3.8
178/Newport (L. Beltra)	53	21	107.5		13.4					3.8				3.8
179/Srahmore	34	13	69.2		23.1									23.1
181/Owengarve	12	4	24.9		6.2					2.8	5.0			2.8
185/Owenduff (Bangor)	63	25	127.3		63.7					9.1				9.1
186/Owenmore - MC	100	40	201.1		33.5				5.3					5.3
186.1/ Carrowmore	32	12	64.1						3.2					3.2
187/Glenamoy	32	13	65.4		9.3									9.3
188/Muingnabo	16	6	33.8								16.9			16.9
193/Ballinglen	19	7	39.3				2.8		3.6			3.3		2.8
194/Cloonaghmore (Palmerstown)	60	24	120.5	2.9		3.5	2.9	3.7	4.2				4.2	2.9
196/Brusna	51	20	102.7		2.9				3.4	3.7				2.9
198/Leaffony	12	5	25.2		1.8						1.8			1.8
203/Garvogue (Bonnet)	128	51	257.2	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		7.0						6.0			6.0
208/Duff	48	19	96.5	9.6	10.7	8.8							8.8	8.8
210/Erne	138	55	276.8	17.3	12.0	4.6	13.8	4.5	8.1	5.5	3.8	6.9	18.5	3.8
211/Abbey	14	5	29.6						14.8	1.6				1.6
212/Ballintra	41	16	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	57	23	115.8	8.3	7.2	6.8					5.0			5.0
215/Eany	72	28	144.1			4.8		6.9			5.8			4.8
216/Oily	23	9	46.2		4.2		6.6			3.6			4.2	3.6
217/Bungosteen	22	8	44.1				4.4		4.4				4.4	4.4
219/Glen (Ballyshannon)	41	16	82.0			4.6					5.9			4.6
220/Owenwee (Yellow R)	8	3	17.3	5.8	2.2			4.3	1.1					1.1
221/Bracky	17	7	35.1	4.4				2.5		2.9				2.5
222/Owentocker	21	8	43.4	4.3										4.3
226/Owenamarve	8	3	16.3		2.3				2.3	2.3				2.3
228/Gweedore (Crolly R.)	14	5	29.2	5.8			2.4							2.4

Table D.1: Approximate calculated river lengths and survey densities for all CWEF surveys.

IFI Code/ River	2 km per Site	5 km per Site	Length >SO1 (Km)	Km/Site Achieved										
				2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Min
229/Clady	29	11	58.4	9.7				5.3						5.3
234/Glenna	9	3	19.0		3.2		3.2		3.2			3.2		3.2
235/Tullaghobegly	8	3	17.2	5.7		1.7						8.6		1.7
236/Ray	22	9	45.1	5.6			4.1			3.8		6.4		3.8
240/Lackagh	45	18	90.6	9.1	7.6		6.5	6.5				15.1	8.2	6.5
248/Leannan	109	43	219.0	7.6	7.6	7.6	7.6	7.6	8.4	8.4	8.4	11.0	7.6	7.6
249/Swilly	45	18	90.8	30.3	5.3				6.5	5.7				5.3
250/Isle (Burn)	24	9	48.6					4.9						4.9
251/Burnfoot	11	4	24.0	6.0		4.8								4.8
252/Mill (Letterkenny)	14	5	29.2			9.7					9.7			9.7
253/Crana	43	17	86.6		3.6							43.3	12.4	3.6
256/Clonmany	17	7	35.3	8.8		2.9					3.9			2.9
257/Straid	11	4	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	3	18.1			2.3					6.0			2.3
930/Quin	38	15	77.9								3.5			3.5