Report on Salmon Monitoring Programmes (June 2016-June 2017) funded under the Salmon Conservation Fund

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Salmon Monitoring: Report on projects to Assess Attainment of Conservation Limit for Atlantic Salmon in Irish Rivers

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Executive Summary

- Funding was provided to IFI under the Salmon Conservation Fund to assess the status of salmon in selected catchments. There were three separate elements in the 2016/2017 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.
- CWEF was undertaken in 35 catchments nationally in 2016 (July September). A total of 1300 sites were visited. 25 catchments, mostly in the South and East of the country, were surveyed completely. Persistently high water levels in Summer 2016 prevented survey completion in 10 catchments. Mean CWEF abundance ranged from zero fry/5min on small catchments (e.g. Owenamallagh and Meennascarty, Co. Kerry), to a maximum of 23.38 on the Croanshagh (Co. Kerry). Many larger catchments (the Boyne, Slaney, Nore, Suir and Munster Blackwater) were surveyed in 2016 and while high abundance was recorded at many individual sites, the overall CWEF catchment mean for each was <17 fry. 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.
- In general, rivers where the CWEF threshold value was ≥ 17 over the 2007-2016 period, (based on an average of the most recent five CWEF surveys), 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.
- CWEF data are also important in providing managers with detailed information on salmon fry distribution and abundance. The absence or low density of salmon fry may be related to water quality issues, obstructions, or habitat damage and areas of low abundance can be investigated. These data can be used to target any remediation works that may be required.

- Qualitative distribution data for all other fish species and some other aquatic biota recorded during CWEF sampling is mapped at catchment level.
- The salmon smolt to adult return rate is one of the key performance statistics used to measure salmon survival in the marine phase. This statistic is widely used for all scientific assessments of salmon (e.g. ICES, NASCO etc) for management. Establishing remote monitoring capacity to measure adult salmon return rates was an important objective of the CL attainment programme in 2016/2017. A permanent PIT tag detection antenna and reader unit installed and tested in the Erriff (National Salmonid Index Catchment) upstream trap in early 2016 monitored for any PIT tagged returning adults in 2017. A total of 1020 salmon smolts were PIT tagged in 2016. Over the entire 2017 monitoring period a total of 31 tagged adult salmon registered on the data logger. Numbers of returns peaked in August. Mean length at return was 55.1 cm (range 48-64 cm) and all were 1SW salmon (i.e. grilse). Based on returns the smolt to 1SW salmon survival rate in 2016-17 is 3.04%. A further 1007 wild salmon smolts were PIT tagged in Spring 2017 in the Erriff and adult survivors will return in 2018.
- Salmon scales were collected and analysed for life history information from the Castlemaine and Cork Harbour commercial fisheries. The Castlemaine fishery recorded 82% grilse and 18% multi sea-winter (MSW). Cork harbour recorded 71% grilse, 26% MSW and 13% previously spawned grilse (PSG).

1 Assessment of Attainment of Conservation Limits for Atlantic Salmon in Irish Rivers in 2016: 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 2016/2017 to assess attainment of salmon conservation limits nationally. This report presents the results of activities undertaken in 2016 & early 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 2016 and June 2017:

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

a. Estimate salmon smolt to adult return survival rates

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 2000 adult salmon run the system annually and its research facilities include a full upstream trap/counter at the head of the tide which allows for full counts of upstream migrating fish. Up to 1000 wild smolts per annum will be PIT tagged per annum (depending on smolt output) and the proportion of returning tagged fish will provide a direct estimate of survival. It is envisaged that this installation will subsequently be supported by a medium-term tagging programme (at least 5 years) to 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 2016.

2 Catchment wide electrofishing programme 2016

Sampling Methodology

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

2.1 Results 2016

During 2016 a total of 35 salmon catchments were surveyed nationally; 1300 sites were visited. 25 catchments, mostly in the South and East of the country, were surveyed completely. Persistently high water levels in Summer 2016 prevented survey completion in 10 catchments. 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 2016) for the Catchments Surveyed in 2016

CWEF results for salmon fry in 2016 are summarised in Figure 2.1, Map 2.1 and Table 2.1. Mean CWEF abundance ranged from zero fry/5min on small catchments (e.g. Owenamallagh and Meennascarty, Co. Kerry), to a maximum of 23.38 on the Croanshagh (Co. Kerry). Many larger catchments (the Boyne, Slaney, Nore, Suir and Munster Blackwater) were surveyed during Summer 2016 and, while high abundance was recorded at many individual sites, the overall CWEF catchment mean for each was <17 fry. 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 2016 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 (2007-2016) for catchments surveyed in 2016. Five catchments surveyed in 2016 had a mean annualised catchment wide salmon fry index (all years) of \geq 17 fry: these were the Boyne, Liffey Lower, Corock, Croanshagh and Erriff.

Table 2.1 Summary of annual results and current CWEF indices for completed catchments surveys in 2016.

					Survey Y	/ear				-	Current	# Surveys
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Index	Considered
008/Boyne		21.91	17.54	19.38				13.21		14.37	17.28	5
015/Liffey Lower		21.33	40.12	25.16	17.47	12.12				6.75	<u>20.32</u>	5
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
031/Slaney	19.05		15.94	18.42				17.68		8.70	15.96	5
033/Corock					37.11					5.47	<u>21.29</u>	2
034/Owenduff				4.07	10.05	15.01				2 47	0.75	4
(Wexford)				4.97	10.05	15.91				3.47	8.75	4
038/Nore				18.83						11.77	15.30	2
043/Suir										10.27	10.27	1
051/Tay					8.75				3.07	1.40	4.41	3
053/Colligan					29.32			9.50		3.62	14.15	3
059/Blackwater										12 56	12 56	2
(Mun.)										13.50	13.50	3
069/Bandon										11.01	11.01	1
084/Croanshagh										23.38	23.38	1
103/Behy	15.41	6.14	4.03	8.71	7.17					2.89	5.79	5
108/Emlagh	10.37	3.66	13.38	3.84	2.59					2.10	5.11	5
115/Scorid										1.86	1.86	1
115/Glenahoo										1.86	1.86	1
116/Aghacashla										4.89	4.89	1
116/Owenamallagh										0.00	0.00	1
116/Meennascarty										0.00	0.00	1
168/Erriff	29.51	24.10	16.03	20.43	20.86	24.45	27.45	24.90	28.52	21.72	25.41	5
193/Ballinglen	10.65				15.09		6.37			4.97	9.27	4
210/Erne		7.37	0.17	0.08	0.00	0.00	0.00	1.60	1.16	1.25	0.80	5
234/Glenna			16.80		3.77		7.77			4.00	8.09	4

2.2 **Results 2007 to 2016** Update for 2016

From 2007 to 2016 a total of 136 separate catchments or sub-catchments have been sampled. Repeat surveys have been carried out in multiple catchments to monitor fry levels for management and to fulfil other obligations (e.g. Article 17 reporting under the EU Habitats Directive). Over this period a total of 376 catchment surveys amounting to 8,618 individual site surveys have been conducted nationally. To facilitate assessment of status based on fry abundance mean annual abundance values for the most recent five surveys, where data are available, is calculated. This approach is consistent with the SSCS approach to other datasets and reduces the potential of an extreme result influencing the data disproportionately. The current catchment-specific CWEF indices presented in this document are based on the most recent 5 CWEF surveys CWEF data collated from survey activity since 2007. Annualised CWEF results 2007 to 2016 for all catchment surveyed are presented in Appendix C.

Trends in Salmon Fry Abundance over Time

Data in Figures 2.2 and 2.3 present the CWEF annual mean abundance of salmon fry in 136 catchments where >1 year of electro-fishing data are available. Figure 2.4 shows the average salmon index for all years combined for each catchment surveyed to date. 45 catchments have only one survey within the period used to calculate the CWEF index (Map 2.2).

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 2016 is presented (Map 2.2).



Map 2.1: Catchment-wide electrofishing summary results for catchments surveyed in 2016 along with their salmon angling status during the 2015 angling season.





Fig 2.2: Annual Catchment-Wide Electrofishing results 2007-2016.











Map 2.2: Mean Salmon Fry index for all catchments (all years sampled) including 2016 data, compared to 2015 salmon angling fishery status (open, catch & release or closed)

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

Telemetry is a technology that can be used to track fish in the aquatic environment. Many different options exist to tag fish which is dependent on the species management requirements and the habitat type in which the species occurs in. 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 in these systems and also recovery of tags from any broodstock captured in traps. Given that adult returns are low reliance on retrieving tags from returning fish, where capture rates are also low (10-20% of the population for rod caught fish), may compromise data quality particularly in years where rod catch is low.

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

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

In order to enhance smolt to adult survival data for wild salmon in Irish rivers a PIT tag recording system was installed in the River Erriff (National Salmonid Index Catchment). This provides capacity to provide a direct count of the numbers of returning tagged adult fish and generation of a direct estimate of salmon marine survival. On average in recent years 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 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.

3.1 Erriff River PIT tagging project

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 APT 12 Pre-Loaded)



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

in Spring 2016.

Smolt sampling commenced in late March and concluded in early May. Sampling was conducted at two sites: Tawnyard trap, a fixed trap located on the Black River, a tributary of the main Erriff and on the upper main channel using a screw trap. A total of 1020 smolts were tagged (Fig. 3.2) and the majority were tagged over a few days in late April. Main river mean smolt length was 11.7 cm (SD 1.04) while smolts trapped in the Black river were larger - 13.5 cm (SD 1.39) (Table 3.1). The Black river drains Tawnyard Lake – smolt size difference may indicate that the lake may influence smolt size. Scale analysis will be undertaken to investigate this observed difference.

In April-May 2017 a total of 1007 salmon smolts were PIT tagged on the Erriff. 256 were tagged at the Black River trap (Tawnyard lake outflow) and 751 were captured by screw trap and tagged in the middle reaches of the main channel.



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

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

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

3.1.1 Smolt to adult salmon returns to Erriff 2017

Remote monitoring for PIT tagged adult salmon returns is undertaken on the Erriff upstream trap situated at Aasleagh falls. During peak salmon runs, the upstream trap is open from 8:00 am daily, which allows for continuous daily monitoring of all fish, removal of tagged fish for inspection and collection of their biometric data. To ensure that the majority of PIT tagged fish are biometrically sampled during the peak run period, the trap is closed at 20:00 hr daily until 8:00 am the following day to prevent fish entry. Fish tend to remain in the holding pools below the trap and enter subsequently. During the off peak period, the trap is permanently open and all PIT tagged salmon are detected by the PIT tag antenna and a total fish count is also obtained.

A total of 2959 adult salmon (tagged and untagged) were counted through the counter in 2017. The majority of the run (ca 80%) entered the system between early June and early August, peaking in early August. A total of 31 PIT tagged adult salmon registered on the data logger. Tagged fish returned between 23 June and 14 Sept 2017 and numbers peaked in August. Returns of tagged and untagged salmon was comparable (Fig. 3.3) which demonstrates that the tagging programme is providing a representative sample of population performance through direct counting, and does not rely on logging rod caught salmon only, thus reducing variability that may arise from differential rod exploitation rates and environmental conditions (high water/low water etc).

Based on these returns the smolt to 1SW salmon survival rate in 2016-17 was 3.04%. The percentage survival from this smolt cohort may increase moderately if tagged 2SW salmon return to the system in 2018 but the numbers of MSW returning to the catchment is typically in low percentages.

Mean length at return was 55.1 cm (range 48-64 cm) and all were 1SW salmon (i.e. grilse) (Fig. 3.4).

The return rate in 2017 falls within the range of survival recorded for the North East Atlantic Commission by ICES over the past decade (ICES, 2018). A 3-5 year dataset is required from the Erriff to establish variance levels and to understand factors that may also influence survival rate locally.

There has been an overall declining trend since 1980 in the return rates (marine survival) of 1SW wild smolts in both Northern and Southern NEAC areas (ICES, 2018). Results from ICES analyses are consistent with the information on estimated returns and spawners as derived from the PFA model, and suggest that returns are strongly influenced by factors in the marine environment. Poor survival in the marine environment has been identified as the key factor and initial results from the Erriff are consistent with this finding.



Fig. 3.4 Forklength (cm) of PIT tagged adult salmon at Erriff trap 2017



4 Biological Assessment of Salmon Populations.

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

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

4.1 Salmon Life History.

Salmon scales have been collected by commercial fishermen and fisheries officers from several commercial draft net fisheries and by anglers in rod fisheries, since 2010. Biological data, date and location of capture are recorded, and this process has resulted in a substantial scale collection being assembled. From 2005 to 2016 a total of 7823 sets of salmon scales have been collected from 18 different fisheries (Table 4.1). Almost 48% of the total was from the commercial fishery on the River Nore. The Corrib angling fishery contributed almost 14% while the Castlemaine commercial fishery accounted for 13.4%.

			Fisher Type		Le	Length Weight Information				Dates Fish	Captured	
River	Year	Angling	Commercial or Scientific	Illegal	None	Length & Weight	Length only	Weight Only	Aged/ Examined	Grand Total	From	То
Bandon	2015	51				46	1	4	51	51	10/05/2015	27/09/2015
Blackwater (Munster)	2011	13	54			52	11	4	67	67	13/07/2011	12/08/2011
Blackwater (Munster)	2012	1	133			103		31	132	134	28/05/2012	27/08/2012
Blackwater (Munster)	2013	6				1		5	6	6	02/05/2013	26/06/2013
Boyne	2013		186		2			184	101	186	18/06/2013	25/09/2013
Castlemaine Harbour [‡]	2010		785			785			163	785	10/06/2010	28/08/2010
Castlemaine Harbour [‡]	2013		238		54	32	6	146	28	238	03/05/2013	30/07/2013
Castlemaine Harbour [‡]	2016				1	5	30		34	36	15/06/2016	28/07/2016
Cork Harbour	2013		142		21	80	1	40	25	142	16/05/2013	01/08/2013
Cork Harbour	2016				2	103	17	7	42	129	01/06/2016	15/09/2016
Corrib	2012	1				1			1	1	09/03/2012	09/03/2012
Corrib	2014	385				372	10	3	50	385	02/04/2014	22/08/2014
Corrib	2015	708				708			176	708	24/03/2015	31/07/2015
Erriff	2005		6			6			6	6	02/07/2005	08/07/2005
Erriff	2015	130				129		1		130	10/07/2001	25/09/2015
Feale	2006		15				15		15	15		
llen	2013		13					13	13	13	14/05/2013	22/07/2013
Inny	2013		9		3	3		3	6	9	26/06/2013	02/07/2013
Laune	2013		18		18					18	07/06/2013	10/07/2013
Nore	2009	2	42		2	16	22	4	44	44	03/08/2009	29/09/2009
Nore	2010	4	87		6	80		5	78	91	05/07/2010	30/09/2010
Nore	2011	1	1205		5	1182	8	11	143	1206	12/05/2011	12/08/2011
Nore	2012	2	357	2		351		10	76	361	10/05/2012	15/09/2012
Nore	2013	1	1471		9	1404	23	36	81	1472		
Nore	2014		498			484	2	12		498	13/05/2014	14/08/2014
Owenmore - Ballinahinch	2006		18				18		17	18		
Owenmore - Ballinahinch	2007	12				11		1	12	12	16/07/2007	21/09/2007
Owenmore - Ballinahinch	2008	18				18			18	18	23/06/2008	19/09/2008
Owenmore - Ballinahinch	2009	13				13			13	13	13/07/2009	04/08/2009
Owenmore - Ballinahinch	2010	2				2			2	2		
Owenmore - Ballinahinch	2011	9				8		1	9	9	09/05/2011	13/08/2011
Owenmore - MC	2006		6		6				6	6		
Sneem	2011	18				7		11	17	18	21/05/2011	17/09/2011
Suir	2010	8		2		9	1		8	10	12/08/2010	21/10/2010
Suir	2011	2	480		2	448	8	24	111	482	01/07/2011	09/09/2011
Suir	2012		9			9			9	9	19/07/2012	06/08/2012
Waterford Estuary	2007	4		1			5		5	5	10/05/2007	09/08/2007
Waterford Estuary	2008	14				10	4		14	14	23/10/2008	23/11/2008
Waterford Estuary	2009	4	6			4	6		9	10	01/08/2009	03/11/2009
Waterford Estuary	2010	7	459		2	20	444		296	466	14/07/2010	27/10/2010
Grand Total		1416	6237	5	133	6502	632	556	1884	7823		

Table 4.1: Summary of Scale collection from adult fish caught 2005 to 2016 at various locations throughout Ireland. ⁺- Common estuaries, [‡]- Includes scales found to be unreadable.



Figure 4.1: The number of salmon scales (Total=6706) in the sample collection by week of capture (where known).

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

Of the 1850 fish for which age has been determined, 647 of fish were Multi-sea winter fish (MSW), 1110 were grilse; the remaining 93 fish were previously spawned grilse (PSG). Of the three fish types the MSW were on average the largest, with a mean weight of 5.08kg (n=583), PSG had an average weight of 4.85kg (n=67) and grilse an average weight of 2.60kg (n=67). Most of the grilse were below 4kg and all MSW and PSG were 4kg or above. The sizes and proportions of fish types vary considerably between catchments (Fig 4.2).

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

<u></u>			
Fish Type	Mean	SD	n
Grilse	2.60	0.89	799
MSW	5.08	1.61	583
PSG	4.85	1.88	67
Total			1449

Table 4.2: Summary of Weights (kg) of salmon for which age has been determined by scale reading.



Figure 4.2: Boxplots of weight (g) of fish life history in different catchments 2005-2016, where both age and weight are known, total=1449.



Figure 4.3: Occurrence of fish life history in different catchments 2005-2016 (n=1858).

4.1.1. Comparison of Life history over time in various catchments

Salmon ages and length profiles over time were compared over time and between catchments. The proportions of salmon of various weights have remained stable over time.

The lengths of grilse and MSW salmon has also remained stable, with most fish over 4 kg being multi sea-winter fish. In both the Castlemaine and the Cork Harbour fishery the length weight relationship was poorly defined in 2013. Since that time the data collected has become more precise providing more confidence in the results.

Comparison of Size and Age profile of Castlemaine Salmon over time (Panel 4.1)

Commercial fishermen in Castlemaine harbour returned scales from 36 fish. Just 5 of these had length and weight information, these 5 conformed to the length weight relationship found in 2010. Scale reading determined that 82% were grilse and 18% multi sea-winter (MSW); both salmon over 4kg were multi sea-winter fish, as were all six salmon over 68cm.

Comparison of Size and Age profile of Cork Harbour Salmon over time (Panel 4.2)

Commercial fishermen in Cork harbour returned scales from 129 fish in 2016. Of these 103 had both length and weight information, these showed a much tighter length weight relationship than found in 2013. Age was determined by scale reading for 35 salmon, this found that 71% were grilse, 26% MSW and 13% PSG. The mean weight of MSW salmon was 4.17kg (standard deviation 1.47kg, n=8), grilse had a mean weight of 2.25kg (sd 0.5kg, n=26), only one of the fish had previously spawned, this fish weighed 3.9kg.



Panel 4.1. Summary of lengths and weights of fish captured on the Castlemaine 2010 to 2016. Top left: Weight frequency histograms; top right, length frequency histograms; Bottom left: Log Length/ Log weight relationship each year; Bottom right: Number of cases of fish with both length and weight information each year.



Panel 4.2. Summary of lengths and weights of fish captured in Cork Harbour 2013 and 2016. Top left: Weight frequency histograms; top right, length frequency histograms; Bottom left: Log Length/Log weight relationship each year; Bottom right: Number of cases of fish with both length and weight information each year.

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Appendices

A. Catchment Wide Electrofishing Results

Presentation of Electro-fishing Results

Data are presented for each river electro-fished in each River Basin District in 2016. Results of any previous catchment wide electro-fishing surveys undertaken over the 2007-2016 period are also shown. Data are presented on the current CWEF index and the number of surveys considered in the index calculation. Each system is presented as a standalone report.

A.1.Neagh Bann IRDB.

Summary

Since 2007 five rivers in the Neagh Bann Inland Fisheries District have been surveyed as part of the on-going catchment-wide electrofishing surveys (Table A.1). At present two rivers are meeting the threshold of 17 salmon fry per 5min. No catchments were required to be surveyed in 2016.

Survey Year											# of Annual
										Current	Surveys
IFI Code/ River	2008	2009	2010	2011	2012	2013	2014	2015	2016	Index	Considered
002/Flurry			5.24					17.15		11.19	2
003/Castletown		26.41				22.96	13.59			20.99	3
004/Fane		16.17			22.09			8.94*		<u>19.13</u>	2
005/Glyde	2.49	17.08	31.61					5.56		14.18	4
006/Dee	8.55	16.92	21.72	20.13				10.51		15.56	5

Table A.1.1: Catchment-wide Electrofishing data for the Neagh Bann IRFB 2007-2015 showing the average salmon fry captured per 5min for each year surveyed. Also shown is the current CWEF index.

Bold annual figures indicate years included in calculation of current CWEF index.

Underlined index figures indicate those exceeding the 17 salfry threshold.

* Incomplete surveys not included in calculation of current index.





A.2. Eastern River Basin District.

Summary

Since 2007, nine salmon rivers have been surveyed in the Eastern River Basin District (ERFB) as part of the on-going catchment-wide electrofishing surveys. These are presented in (Table A.2). The Boyne, Liffey Lower, Vartry and Avoca catchments were surveyed in this district in 2016. Two catchments, the Boyne and the Lower Liffey, are currently above the threshold of 17 salmon fry/5min. All results this year were quite low in comparison with previous surveys.

Table A.2.1: Catchment-wide Electrofishing data for the Eastern River Basin District 2007-2016 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

											Current	# Annuai Surveys
					Survey Ye	ar					Index	Considered
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		
008/Boyne		21.91	17.54	19.38				13.21		14.37	<u>17.28</u>	5
013/Broadmeadow				0.00							0.00	1
014/Tolka					1.08	0.00					0.54	2
015.1/Liffey Lower		21.33	40.12	25.16	17.47	12.12				6.75	<u>20.32</u>	5
015.2/Liffey Upper		12.93	5.11	8.15	16.20	10.13				2.63*	10.51	5
016/Dodder					13.93						13.93	1
018/Dargle			1.40	2.53	7.52				4.19		3.91	4
021/Vartry		10.00	15.11	2.54	15.07				5.34	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.

<u>Underlined</u> index figures indicate those exceeding the 17 salfry threshold.

* Incomplete surveys not included in calculation of current index.



A.2.1.River Boyne

IFI Salmon Catchment #: 2016 survey dates: Mean Salmon Fry/5 min (2016): CWEF Index:

Sampling carried out by: Maureen Byrne Phillip Duff Robert Bergin

8 30/6/16 - 27/7/16 14.37 fry/5min. 17.28 fry/5min.

Fish Species Present:

Brown Trout	Perch
Crayfish	Pike
European Eel	Roach
Gudgeon	Salmon
Lamprey	Stoneloach
Minnow	3-Spined Stickleback

Figure A.2.1.1: Length distribution of salmon captured in 2016 CWEF survey on the Boyne Catchment.



Figure A.2.1.2: Comparison of mean salmon fry/5min for all surveys on the Boyne catchment to 2016.



Table A.2.1.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.2.1.2: Conservation limits and provisional returns on the Boyne catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Mean Salmon Fry/ 5min Annual Salmon Fry/ 5min
2008	127	1	4			8.41	2007	2008	14274	-5009	C & R	21.91
2009	142		4			7.61	2008	2009	13831	-4554	C & R	17.54
2010	143	1	1			7.66	2009	2010	13831	-4239	C & R	19.38
2014	144	2	1	1		7.50	2010	2011	13831	-7069	C & R	
2016	145		1		1	7.55	2011	2012	13831	-6328	C & R	
							2012	2013	13831	-7069	C & R	
							2013	2014	10236	-5857	C & R	13.21
							2014	2015	10238	-6445	C & R	
							2015	2016	10238	-6879	C & R	14.37 17.28

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

This survey, the fifth of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. The survey comprised 155 sites, 145 of which were included in the analysis. The maximum fry catch was 106 salmon at site 100. The mean catch of included sites was 14.37 salmon fry/5min. Two cohorts of juvenile salmon were captured; the modal length category of 0+ fry caught was 5.5cm.

Conclusion

The Boyne had a mean catch of 14.37 salfry/5min in 2016 resulting in a cumulative average of 17.28 salmon fry/5min; this is above the threshold of 17 salmon fry per 5 minutes.

Sito		Stream	Pifflo	Salmon		Salmon
Number	Grid Ref.	Order	Grade	Fry	Site Status	Fry/5min
Number		oraci	Grade	Captured		119751111
1	O 04559 76270	2	2	0	Include	0.00
2	0 03743 76131	2	2	0	Include	0.00
3	0 03553 75562	4	1	0	Include	0.00
4	0 01836 74786	4	1	24	Include	31.68
5	0 01073 75662	3	1	22	Include	29.04
6	0 00151 76304	3	2	14	Include	18.12
/	0 00655 77097	3	2	12	Include	15.65
8	0 01278 78167	3	2	4	Include	5.09
9	0 02350 79930	3	1	14	Include	18.31
10	N 00759 91707	5	5 2	1	Include	1.50
12	0 00044 76347	2	2	6	Include	0.00 7 71
13	N 98016 76796	2	2	6	Include	7.71
14	N 95160 74120	6	1	30	Include	33.85
15	N 94109 74800	3	2	13	Include	15.05
16	N 92779 72238	3	2	0	Include	0.00
17	N 91862 72425	3	1	15	Include	16.76
18	N 83523 71087	4	2	7	Include	7.00
19	N 84387 72738	4	2	0	Include	0.00
20	N 84325 74351	4	1	0	Include	0.00
21	N 76727 79157	4	1	7	Include	9.00
22	N 75611 80251	4	1	65	Include	87.61
23	N 74106 81623	4	1	39	Include	52.00
24	N 73143 82836	4	1	21	Include	25.77
25	N 71964 83239	4	1	46	Include	57.50
26	N 71645 84960	4	2	11	Include	13.36
28	N 67970 90855	4	2	25	Include	32.14
29	N 67583 91610	4	1	7	Include	8.75
30	N 68235 93900	4	1	0	Include	0.00
31	N 74737 76793	5	1	19	Include	25.97
32	N 73727 77254	5	1	53	Include	70.04
33	N /1593 //349	5	1	34	Include	44.69
34	N 65288 80338	5	2	16	Include	22.00
35	N 63065 83352	5	3	0	Include	0.00
30 27	N 00425 87205	4	2 1	0	Include	0.00
37	N 59972 00042	4	1	2	Include	0.00
30	N 68684 75948	2	2	5	Include	5.50
41	N 67018 78413	2	1	0	Include	0.00
42	N 66343 77362	2	2	0	Include	0.00
43	N 63511 81170	3	1	8	Include	10.00
44	N 61966 80726	2	2	5	Include	6.25
45	N 62234 86173	3	1	0	Include	0.00
46	N 64049 85435	3	2	0	Include	0.00
47	N 59474 87073	4	2	0	Include	0.00
48	N 59023 87853	4	2	0	Include	0.00
50	N 90108 62664	4	1	38	Include	44.19
51	N 89457 61385	4	1	13	Include	15.89
53	N 88994 57371	4	2	5	Include	6.07
54	N 90550 62213	2	2	25	Include	28.21
55	N 93216 61860	2	2	0	Include	0.00
56	N 85005 60594	4	1	17	Include	19.83
57	N 84058 60263	4	2	24	Include	28.62
58	N 83255 56013	3	1	33	Include	40.47
59	N 87241 53466	3	3	0	Include	0.00
60	N 82907 56215	3	1	4	Include	5.00

Table A.2.1.3: Site specific results of CWEF on the Boyne catchment in 2016.

Sito		Stroom	Pifflo	Salmon		Salmon
Number	Grid Ref.	Order	Grade	Fry	Site Status	Erv/Emin
Number		Order	Graue	Captured		Fry/ Sinni
61	N 82103 55215	3	1	8	Include	9.60
63	N 81904 55027	3	2	0	Include	0.00
64	N 80810 53899	3	1	1	Include	1.14
65	N 80319 52183	3	2	0	Include	0.00
60	N 81073 51259	3	1	41	Include	50.84
68	N 83300 50858	3	2	1	Include	1.50
69	N 76412 56919	4	2	22	Include	26 71
70	N 72824 62765	4	2	0	Include	0.00
71	N 71994 63812	4	1	0	Include	0.00
72	N 69500 68043	4	2	1	Include	1.21
73	N 67622 69164	3	2	14	Include	16.07
74	N 65593 70337	3	1	53	Include	63.26
75	N 64778 71561	3	1	8	Include	10.22
76	N 63740 73559	3	2	0	Include	0.00
77	N 63217 74014	3	2	0	Include	0.00
79	N 62646 75946	3	1	0	Include	0.00
80	N 76480 50393	3	3	0	Include	0.00
81	N 76348 52726	6	2	0	Include	0.00
82	N 70475 54797	4	3	1	Include	1.00
83	N 69381 56085	4	2	3	Include	3.75
84	N 68561 56660	4	1	53	Include	1 22
85	N 67213 58824	4	3	1	Include	1.33
87	N 62096 62592	4	2	42	Include	50.88
88	N 62072 64152	4	1		Include	6.43
89	N 61447 65382	4	1	33	Include	44.34
90	N 60320 67825	3	2	0	Include	0.00
91	N 58937 69128	2	1	0	Include	0.00
92	N 68704 56303	3	2	2	Include	2.40
93	N 66853 56664	3	2	4	Include	4.00
94	N 65128 56330	2	3	0	Include	0.00
95	N 62347 67247	3	2	0	Include	0.00
96	N 62663 68653	2	1	1	Include	1.37
97	N 62148 70071	2	1	0	Include	0.00
98	N 71285 50090	4	1	20	Include	22.40
99	N 71658 49174	4	0	106	Not Sampled	125 10
100	N 72143 45209	4	1	24	Include	125.10
101	N 72832 42033	2	1	24	Include	30.00
102	N 74207 41257	4	3	0	Include	0.00
104	N 72859 42546	2	2	15	Include	18.57
105	N 76796 39863	3	2	0	Include	0.00
106	N 76404 39381	3	1	0	Include	0.00
107	N 74907 38201	3	2	0	Include	0.00
108	N 60351 52598	4	1	29	Include	38.67
109	N 58397 57266	4	1	40	Include	47.44
110	N 58430 57785	3	1	30	Include	34.41
111	N 55870 65518	3	1	37	Include	41.11
112	N 54235 68323	3	1	0	Include	0.00
113	N 59981 50615	4	2	0	Include	0.00
114	N 58139 50836	4	2	20	Include	30.81
115	N 55620 51210	4	1	12	Include	45.56
117	N 58207 57480	3	1	31	Include	35.43
118	N 56069 56967	3	1	32	Include	40.17
119	N 53813 44575	3	1	0	Include	0.00
120	N 53478 45528	2	1	0	Include	0.00
121	N 52391 45677	2	2	0	Include	0.00
122	N 66963 43529	4	1	0	Include	0.00
123	N 67958 42229	3	1	0	Include	0.00
124	N 69039 41022	2	1	0	Include	0.00
125	N 69552 39085	1	1	0	Stream Order<2	
126	N 63704 39876	2	1	0	Include	0.00
127	N 51088 43160	2	1	7	Include	9.00
128	N 49934 43866	2	2	7	Include	8.40
129	IN 40655 40673	3	2	U	include	0.00

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min	
130	O 01609 71841	3	1	0	Include	0.00	
131	O 00363 69792	2	1	0	Include	0.00	
132	N 78449 79346	3	2	7	Include	8.75	
133	N 78572 80782	3	1	10	Include	12.00	
134	N 77636 81928	2	1	26	Include	32.34	
135	N 78297 82622	2	2	0	Include	0.00	
136	N 76677 84535	2	2	1	Include	1.19	
137	N 70280 86801	4	2	40	Include	47.62	
138	N 69000 87850	4	2	29	Include	38.35	
139	N 68278 88850	4	1	46	Include	61.59	
140	N 74136 78352	2	1	2	Include	2.67	
141	N 90272 55363	3	2	0	Include	0.00	
142	N 81828 62332	3	3	0	Include	0.00	
143	N 85778 54201	3	3	0	Include	0.00	
144	N 69381 68981	4	1	20	Include	20.74	
145	N 61196 76311	3	1	0	Include	0.00	
146	N 65888 49570	5	3	0	Include	0.00	
149	N 66238 32638	3	2	0	Include	0.00	
150	N 58993 38579	3	2	32	Include	37.19	
151	N 57061 39718	3	2	7	Include	9.15	
152	N 51444 35954	2	3	0	Include	0.00	
153	N 80033 72967	2	2	0	Include	0.00	
156	N 68551 49142	5	3	0	Include	0.00	
157	N 68555 49142	5	3	1	Include	1.00	





A.2.2.River Liffey (Lower)

IFI Salmon Catchment #:						
2016 survey dates:						
Mean Salmon Fry/5 min (2016):						
CWEF Index:						

Sampling carried out by: Alan Carter Jarlaith Gallagher Maurice Carolan

Figure A.2.2.1: Length distribution of salmon captured in 2016 CWEF survey on the Lower Liffey Catchment.



Table A.2.2.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Fry Year

2008

2009

2010

2011

2012

2016

ncluded

4

6

10

12

5

16

hreshold Sites

MOID

2

1

1

8 26/7/16 - 3/8/16 6.75 fry/5min. 20.32 fry/5min.

Fish Species Present:

Brown Trout	Roach
Crayfish	Salmon
European Eel	Stoneloach
Lamprey	3-Spined Stickleback
Minnow	





Table A.2.2.2: Conservation limits and provisional returns on the Lower Liffey catchment along with the 2016 CWEF fishing result.

Efficiency	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
				20.29	2007	2008	4391	-2720	Closed	21.33	
				20.29	2008	2009	4391	-2953	Closed	40.12	
	1			11.07	2009	2010	4391	-3563	Closed	25.16	
		3	2	7.16	2010	2011	4391	-3049	Closed	17.47	
		1		17.39	2011	2012	4391	-3026	Closed	12.12	
				7.16	2012	2013	4391	-3549	Closed		
					2013	2014	1711	-1291	C & R		
					2014	2015	1703	-1112	C & R		
					2015	2016	1703	-1064	C & R	6.75	20.32

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

This survey, the sixth of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. The survey comprised 17 sites, 16 of which were included in the analysis. Salmon fry were present at 12 sites. The maximum fry catch was 25 salmon at site 80. The mean catch of included sites was 6.75 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm. A number of large, probably 2+ parr were caught; the modal length of that cohort was 13.5cm.
The Lower Liffey had a mean catch of 6.75 salfry/5min in 2016. Taking the five most recent surveys into account this results in a cumulative average of 20.32 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 2009. The numbers this year are considerably lower than those caught in each of the previous years.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
003	0 02212 35311	6	3	0	Include	0.00
004	O 00919 35793	6	2	4	Include	6.40
018	O 00517 36425	4	3	8	Include	8.00
019	N 97246 37722	4	1	9	Include	9.00
026	O 06791 35732	6	2	3	Include	3.00
027	O 05363 36405	6	1	6	Include	6.00
028	0 03413 35512	6	1	17	Include	18.89
068	N 93367 39400	3	0	0	Include	0.00
069	N 93779 37963	3	2	0	Include	0.00
070	N 94775 38557	4	2	0	Include	0.00
071	N 98338 37688	4	1	12	Include	12.00
072	N 97969 37595	4	2	4	Include	4.00
073	N 99513 36871	4	2	9	Include	9.00
080	O 00430 35860	4	2	25	Include	26.79
106	N 99135 37028	4	2	5	Include	5.00
107	O 03642 34583	4	3	0	Include	0.00
079	N 96592 37891	4	3	1	Efficiency below 60%	

Table A.2.2.3: Site specific results of CWEF on the Lower Liffey catchment in 2016.





A.2.3.River Vartry

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: Alan Carter Jarlaith Gallagher Joe Delany

Figure A.2.3.1: Length distribution of salmon captured in 2016 CWEF survey on the Vartry Catchment.



Table A.2.3.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

21
8/8/16 - 16/8/16
1.75 fry/5min.
7.96 fry/5min.

Fish Species Present:

Brown Trout	Minnow
European Eel	Salmon
Lamprey	Stoneloach

Figure A.2.3.2: Comparison of mean salmon fry/5min for all surveys on the Vartry catchment to 2016.



Table A.2.3.2: Conservation limits and provisional returns on the Vartry catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
2008	4					11.03	2007	2008	189	-80	Closed	10.00	
2009	4					11.03	2008	2009	189	-80	Closed	15.11	
2010	13					3.39	2009	2010	189	-88	Closed	2.54	
2011	11					4.01	2010	2011	189	-88	Closed	15.07	
2015	13			2		3.39	2011	2012	189	-88	Closed		
2016	12					3.68	2012	2013	189	-88	Closed		
							2013	2014	274	-175	Closed		
							2014	2015	273	-175	Closed	5.34	
							2015	2016	273	-175	Closed	1.75	7.96

1SW = One Sea Winter ; CL= Conservation Limit.

This CWEF survey, the sixth of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. The survey comprised 12 sites, all of which were included in the analysis. Salmon fry were present at 8 sites. The maximum fry catch was 6 salmon at site 14. The mean catch of included sites was 1.62 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm. The number of fry older than 0+ was relatively high.

The Vartry had a mean catch of 1.75 salfry/5min in 2016. Taking the five most recent surveys into account this results in a cumulative average of 7.96 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 2009. The numbers this year are considerably lower than those caught in each of the previous years.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	T 28643 96698	4	2	0	Include	0.00
002	T 27751 96708	4	2	4	Include	4.00
003	T 27073 97363	3	2	2	Include	2.00
004	T 25500 97823	3	2	3	Include	3.00
005	T 26698 97461	3	2	2	Include	2.00
006	T 29295 96633	4	1	0	Include	0.00
007	T 25875 97593	3	2	2	Include	2.00
009	T 24911 98736	3	2	1	Include	1.00
010	T 24548 99102	3	3	0	Include	0.00
012	T 23053 99064	3	2	0	Include	0.00
014	T 30020 96460	4	1	6	Include	6.00
021	T 27196 97025	4	2	1	Include	1.00

Table A.2.3.3: Site specific results of CWEF on the Vartry catchment in 2016.

Map A.2.3.1: Showing locations of 2016 survey sites on Vartry River.



A.2.4.River Avoca

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: Alan Carter Jarlaith Gallagher Maurice Carolan

Figure A.2.4.1: Length distribution of salmon captured in 2016 CWEF survey on the Avoca Catchment.



Table A.2.4.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2008	16	5				16.41
2009	29	2				11.12
2010	24	2				13.25
2011	65				16	4.25
2012	23	6		1		11.49
2016	45					7.66

26 15/9/16 - 30/9/16 1.89 fry/5min. 7.34 fry/5min.

Fish Species Present:

Brown Trout	Lamprey
Crayfish	Minnow
European Eel	Salmon

Figure A.2.4.2: Comparison of mean salmon fry/5min for all surveys on the Avoca catchment to 2016.



Table A.2.4.2: Conservation limits and provisional returns on the Avoca catchment along with the 2016 CWEF fishing result.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
2007	2008	2958	-1103	Closed	3.79	
2008	2009	2958	-1501	Closed	5.56	
2009	2010	2958	-1501	Closed	5.20	
2010	2011	2958	-1501	Closed	18.88	
2011	2012	2958	-1501	Closed	5.15	
2012	2013	2958	-1501	Closed		
 2013	2014	3945	-3055	Closed		
2014	2015	3945	-3050	Closed		
2015	2016	3945	-3050	Closed	1.89	7.34

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

This CWEF survey, the sixth CWEF survey of this catchment in the 2007 to 2016 period, was carried out during September 2016. The survey comprised 45 sites, all of which were included in the analysis. Salmon fry were present at 20 sites. The maximum fry catch was 15 salmon at site 13. The mean catch of included sites was 1.89 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm. The number of fry older than 0+ was relatively high.

The Avoca had a mean catch of 1.89 salfry/5min in 2016. Taking the five most recent surveys into account this results in a cumulative average of 7.34 salmon fry/5min which is below the 17 salmon fry threshold. The result is the lowest of any CWEF survey in 2016 and ranks considerably lower than the maximum abundance recorded in 2011 when a value of 18.88 sal fry per 5 min was recorded.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	T 21651 75235	6	1	. 1	Include	1.00
003	T 19647 82194	5	1	0	Include	0.00
005	T 11797 79078	4	1	3	Include	3.00
006	T 17211 84992	4	1	0	Include	0.00
007	T 14660 87292	4	1	9	Include	9.00
008	T 19181 83266	5	1	0	Include	0.00
012	T 14361 95637	4	2	3	Include	3.00
013	T 15892 96911	4	2	15	Include	15.00
014	T 17275 99199	4	2	11	Include	11.00
019	T 14128 97267	3	3	0	Include	0.00
020	T 09303 81516	4	2	0	Include	0.00
021	T 07256 84765	4	1	1	Include	1.00
022	T 07657 83637	4	1	0	Include	0.00
024	T 10532 90732	4	2	2	Include	2.00
025	T 10879 77849	4	1	0	Include	0.00
026	T 19266 88973	5	0	9	Include	9.00
027	T 15983 92960	5	0	5	Include	5.00
031	T 12481 96767	3	2	0	Include	0.00
032	T 13764 96377	4	1	2	Include	2.00
034	T 20367 79914	5	2	0	Include	0.00
037	T 19080 82962	5	2	0	Include	0.00
042	T 11023 96400	3	2	0	Include	0.00
043	T 10839 97690	3	2	0	Include	0.00
051	T 16501 98335	4	1	9	Include	9.00
052	T 14450 95795	4	1	2	Include	2.00
064	T 12867 96631	4	1	5	Include	5.00
068	T 08284 92458	4	1	0	Include	0.00
073	T 10939 80116	4	3	0	Include	0.00
076	T 19078 77033	5	2	0	Include	0.00
080	T 07498 74980	3	2	0	Include	0.00
117	T 17024 92099	5	0	1	Include	1.00
119	T 12686 79495	5	2	1	Include	1.00
120	T 19585 78535	5	2	0	Include	0.00
121	T 10217 76623	4	1	2	Include	2.00
122	T 09815 91101	4	2	0	Include	0.00
123	T 07960 92795	4	1	1	Include	1.00
124	T 07269 93578	4	1	0	Include	0.00
125	T 18970 77000	4	2	2	Include	2.00
126	T 18088 76063	3	2	0	Include	0.00
127	T 18026 75017	2	2	0	Include	0.00
128	T 11844 78928	4	2	0	Include	0.00
129	T 11640 78637	4	1	0	Include	0.00
130	T 11306 78204	4	2	1	Include	1.00
131	T 13472 98820	3	1	0	Include	0.00
132	O 12057 01097	3	2	0	Include	0.00

Table A.2.4.3: Site specific results of CWEF on the Avoca catchment in 2016.





A.3.South Eastern River Basin District

Summary

Since 2007, eleven salmon rivers have been surveyed in the South Eastern River Basin District as part of the on-going catchment-wide electrofishing surveys. These are presented in Table A.3. The Slaney, Corock, Owenduff, Nore, Suir (incorporating the Suir, Clodiagh, Lingaun and Waterford Blackwater), Mahon and Tay were surveyed in this district in 2016. The Pollmounty (a small sub-catchment of the Barrow) was also surveyed. Two catchments, the Corock and the Barrow, are currently above the threshold of 17 salmon fry/5min. All results this year were quite low in comparison with previous surveys.

Table A.3.1: Catchment-wide Electrofishing data for the South Eastern River Basin District 2007-2016 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

		Survey Year									# Annual	
					,						Current	Surveys
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Index	Considered
028/Owenavorragh				19.76			0.33		4.61		8.23	3
031/Slaney	19.05		15.94	18.42				17.68		8.70	15.96	5
032/Duncormick								11.54			11.54	1
033/Corock					37.11					5.47	21.29	2
034/Owenduff (Wex.)				4.97	10.65	15.91				3.47	8.75	4
037/Barrow	17.72		10.93	8.71	21.23	26.72				8.93*	17.06	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 salfry threshold.

* Incomplete surveys not included in calculation of current index.

Figure A.3.1: Summary of CWEF results in South Eastern River basin district 2007-2016.



A.3.1. River Slaney

Sampling carried out by: Michael Farnan Morgan Rowsome Myles Roban Philip Carduff

Figure A.3.1.1: Length distribution of salmon captured in 2016 CWEF survey on the Slaney Catchment.



31 2/8/16 - 26/8/16 9.11 fry/5min. 15.96 fry/5min.

Fish Species Present:

Brown Trout	Roach
European Eel	Salmon
Lamprey	Stoneloach
Minnow	3-Spined Stickleback





Table A.3.1.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.3.1.2: Conservation limits and provisional returns on the Slaney catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon	Mean Salmon
2007	8					108.24	2007	2008	5234	-1236	C & R		
2008				1		865.93	2008	2009	828	490	C & R	15.94	
2009	31	17				18.04	2009	2010	923	33	C & R	18.42	
2010	79					10.96	2010	2011	609	-202	C & R		
2014	99	22				17.16	2011	2012	609	-282	C & R		
2016	122	14		1		6.32	2012	2013	609	-208	C & R		
							2013	2014	917	-741	C & R	17.68	
							2014	2015	915	-770	C & R		
							2015	2016	915	-830	C & R	8.70	15.96

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

This CWEF survey, the fifth and most comprehensive of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. The survey comprised 137 sites, 122 of which were included in the analysis. Salmon fry were present at 108 sites. The maximum fry catch was 61 salmon at site 9. The mean catch of included sites was 9.11 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm; the proportion of larger fry present was high.

The Slaney had a mean catch of 8.70 salfry/5min in 2016. Taking the five most recent surveys into account there is a cumulative average of 15.96 salmon fry/5min which is below the 17 salmon fry threshold. There has been a significant reduction in the salmon fry average this year in comparison to previous survey years.

Site		Stream	Riffle	Salmon		Salmon
Number	Grid Ref.	Order	Grade	Fry	Site Status	Frv/5min
		0.00	0.440	Captured		,,
002	S 87441 90777	4	1	14	Include	18.38
003	S 93646 93769	4	2	14	Include	16.80
004	S 97670 93867	4	1	22	Include	26.00
005	T 06529 52250	4	1	0	Include	0.00
006	T 07445 53249	4	1	3	Include	3.60
008	S 95050 92400	3	1	18	Include	25.00
009	S 98790 95029	3	1	61	Include	68.18
010	S 99475 86456	3	1	18	Include	22.00
011	S 99763 84455	4	1	9	Include	11.70
012	S 99828 83556	4	2	13	Include	17.64
014	S 95409 80761	4	1	21	Include	25.67
015	S 94417 80422	4	1	14	Include	20.36
017	S 96096 94786	4	1	11	Include	13.54
018	S 94156 94384	4	1	17	Include	22.00
019	S 93369 93120	4	2	18	Include	24.00
020	S 91635 93905	4	1	28	Include	40.00
022	S 88928 59755	2	2	2	Include	2.00
023	S 88110 60347	2	2	3	Include	3.00
024	S 89211 59376	2	2	0	Include	0.00
025	S 96144 92379	3	1	2	Include	2.80
026	S 95683 92485	3	1	21	Include	25.38
027	S 93582 93103	3	1	18	Include	25.58
028	T 11567 68172	3	2	2	Include	2.46
029	T 12564 66811	3	2	3	Include	3.00
030	T 12207 64339	3	1	4	Include	4.57
031	T 09279 60004	3	2	0	Include	0.00
032	T 03092 49217	4	1	2	Include	3.00
033	S 90820 94898	3	1	18	Include	22.70
035	S 91681 96040	2	1	1	Include	1.38
036	S 90763 94873	3	1	10	Include	12.35
037	S 90413 94533	3	1	6	Include	9.00
038	S 84251 37840	3	1	3	Include	3.00
039	S 84742 37710	3	1	0	Include	0.00
040	S 85887 37990	3	2	0	Include	0.00
041	S 87119 37379	3	1	5	Include	6.00
042	S 87693 36443	4	1	1	Include	1.43
043	S 89723 33996	4	1	0	Include	0.00
044	S 95717 36463	4	1	2	Include	2.50
045	S 89904 60463	6	2	1	Include	1.50
049	T 01389 69267	5	1	8	Include	9.60
055	S 85247 68469	4	2	0	Include	0.00
056	S 87709 62686	3	1	4	Include	4.89
057	S 93983 63261	2	2	2	Include	2.00
058	T 09362 57490	4	2	3	Include	4.00
059	T 12057 62107	4	1	0	Include	0.00
060	T 10829 59100	3	1	3	Include	3.00
061	T 11342 59329	4	1	0	Include	0.00
062	S 93669 84172	4	1	1	Include	1.00
063	T 00793 43835	3	2	0	Include	0.00
064	S 88129 86523	4	1	12	Include	17.54
065	S 87003 88171	4	1	44	Include	54.00
066	T 05229 51330	4	1	1	Include	1.67
067	S 88827 85649	4	1	8	Include	10.00
069	S 85598 78597	5	1	15	Include	18.53

Table A.3.1.3: Site specific results of CWEF on the Slaney catchment in 2016.

Site		Stream	Riffle	Salmon		Salmon
Number	Grid Ref.	Order	Grade	Fry	Site Status	Fry/5min
070	\$ 87771 82215	5	1	Captured	Include	6.00
070	S 85187 73011	5	1	27	Include	31.82
072	S 85006 71434	5	1	14	Include	17.50
073	S 84912 69835	5	1	20	Include	23.64
074	S 90221 57861	6	3	2	Include	3.33
075	S 92312 55672	6	1	3	Include	3.00
076	S 93165 54435	6	2	4	Include	4.00
077	5 96/91 48944	о 2	2	5	Include	0.43
078	S 96799 84548	2	2	0	Include	0.00
080	S 93588 82810	4	1	6	Include	7.50
081	S 86598 37735	3	2	3	Include	4.00
082	S 89283 34754	4	1	0	Include	0.00
083	S 95723 39513	4	1	9	Include	10.80
084	S 94661 39925	4	2	6	Include	7.00
086	S 92038 40710	4	1	5	Include	5.63
087	5 96709 38823	4	1	26	Include	7.00
091	S 87578 91406	4	1	18	Include	25.58
094	T 01614 39499	3	2	0	Include	0.00
095	T 00694 40695	3	2	0	Include	0.00
097	S 99588 41779	3	1	0	Include	0.00
098	S 89704 43626	4	1	3	Include	3.43
100	S 89353 85159	4	1	4	Include	5.60
101	S 90292 85612	4	1	1	Include	1.33
102	S 90955 86254	4	1	4	Include	4.89
104	T 01229 69624	5 4	1	2	Include	2.00
107	S 88910 91195	2	1	11	Include	13.75
108	S 87818 91463	2	1	8	Include	10.40
110	T 02079 74451	3	2	3	Include	5.00
111	T 03110 73597	3	2	4	Include	4.00
112	S 91565 32797	4	2	0	Include	0.00
113	S 93007 33617	4	2	3	Include	3.00
114	5 94245 35057	4	1	0	Include	0.00
115	S 92712 52052	2	2	2	Include	2.00
117	S 89300 62514	6	2	0	Include	0.00
118	T 00363 86335	2	2	15	Include	18.53
119	S 84581 68128	4	2	0	Include	0.00
120	S 87174 70277	3	2	6	Include	6.86
123	S 91431 56920	6	2	5	Include	5.00
124	S 89892 59633	6	2	4	Include	4.00
125	5 85490 08400 S 95826 50898	4	1	10	Include	12.31
127	S 86724 88621	4	1	16	Include	19.76
128	S 87659 92334	4	1	20	Include	25.71
129	S 90678 93521	4	2	5	Include	6.11
130	T 10010 59548	3	2	0	Include	0.00
131	T 11969 67721	3	2	0	Include	0.00
132	S 94227 83939	4	2	1	Include	1.43
134	5 93084 80806	4	1	10	Include	14.17
135	S 90003 59820	5	2	3	Include	3.00
138	S 93718 79786	4	1	17	Include	22.67
139	T 02126 70776	4	1	10	Include	13.64
140	T 03919 71775	4	1	5	Include	5.00
141	S 99147 83095	4	1	20	Include	24.76
143	S 98836 66846	5	1	7	Include	9.00
144	S 90936 56835	3	1	15	Include	15.00
140	2 20510 02155 2 21088 01034	5	⊥ ⊃	8 6	Include	8.00
140	2 88602 73260 2 93210 33720	4 4	∠ 1	ס 2	Include	0.00 2 00
150	S 83821 37933	3	1	0	Include	0.00
151	S 81288 40922	3	2	0	Include	0.00
152	T 09477 57670	4	2	0	Include	0.00
153	S 97574 80717	4	2	4	Include	5.33
154	S 99196 63135	4	3	0	Include	0.00

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	S 94290 52607	2	2	4	Efficiency below 60%	
007	S 89647 54844	3	2	2	Efficiency below 60%	
051	T 03870 72471	3	1	2	Efficiency below 60%	
052	T 02119 48454	4	2	1	Efficiency below 60%	
085	S 93979 40349	4	1	2	Efficiency below 60%	
090	S 91400 96244	3	1	7	Efficiency below 60%	
096	S 93166 54433	6	2	6	Efficiency below 60%	
099	S 98729 44805	4	1	2	Efficiency below 60%	
121	S 86949 80163	5	1	1	Efficiency below 60%	
122	S 89276 62469	6	3	1	Efficiency below 60%	
136	S 89448 74669	5	1	2	Efficiency below 60%	
142	S 96629 80759	4	2	4	Efficiency below 60%	
145	S 98335 45102	6	1	3	Efficiency below 60%	
147	S 84244 67997	4	2	1	Efficiency below 60%	
109	S 98169 81034	4	0	0	Site no longer suitable	



Map A.3.1.1: Showing locations of 2016 survey sites on the Slaney River.

A.3.2.River Corock

Sampling carried out by: Noel Power Tony Byrne 33 2/8/16 - 31/8/16 5.47 fry/5min. 21.29 fry/5min.

Fish Species Present:

Brown Trout	Minnow
European Eel	Salmon
Flounder	Sea Trout
Lamprey	Stoneloach

Figure A.3.2.1: Length distribution of salmon captured in 2016 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 2016.



Table A.3.2.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.3.2.2: Conservation limits and provisional returns on the Corock catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Mean Salmon Frv/ 5min Annual Salmon 5/ 5
2010				3		31.53	2007	2008	733	-417	Closed	
2011	4	2				15.76	2008	2009	733	-417	Closed	
2012				4		23.65	2009	2010	733	-407	Closed	
2016	5					18.92	2010	2011	733	-407	Closed	37.11
							2011	2012	733	-407	Closed	
							2012	2013	733	-407	C&R	
							2013	2014	836	-589	C&R	
							2014	2015	835	-590	C&R	
							2015	2016	835	-590	C&R	5.47 21.29

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

This survey, the second valid CWEF survey of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. The survey comprised 5 sites, all of which were included in the analysis. Salmon fry were present at 4 sites. The maximum fry catch was 10 salmon at site 2. The mean catch of included sites was 5.47 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm; the proportion of larger fry present was high.

The Corock had a mean catch of 5.47 sal fry/5min in 2016. Taking the previous survey into account there is a cumulative average of 21.29 salmon fry/5min which is above the 17 salmon fry threshold.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	S 85781 17723	4	2	0	Include	0.00
002	S 85388 18672	4	1	10	Include	12.35
004	S 86163 22397	2	1	3	Include	4.00
005	S 85834 24106	4	1	3	Include	3.00
008	S 85229 20272	4	1	6	Include	8.00

Table A.3.2.3: Site specific results of CWEF on the Corock catchment in 2016.

Map A.3.1.1: Showing locations of 2016 survey sites on the Corock River.



A.3.3.River Owenduff (Wexford)

Sampling carried out by:	Fish Spe
CWEF Index:	8.75 fry
Mean Salmon Fry/5 min (2016):	3.47 fry
2016 survey date:	31/8/16
IFI Salmon Catchment #:	34

Noel Power **Tony Byrne**

Figure A.3.3.1: Length distribution of salmon captured in 2016 CWEF survey on the Owenduff Catchment.



Table A.3.3.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

•
31/8/16
3.47 fry/5min.
8.75 fry/5min.

ecies Present:

Brown Trout	Salmon
European Eel	Sea Trout
Minnow	3-Spined Stickleback

Figure A.3.3.2: Comparison of mean salmon fry/5min for all surveys on the Owenduff catchment to 2016.



Table A.3.3.2: Conservation limits and provisional returns on the Owenduff catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon	Mean Salmon
2010	3					10.90	2007	2008	201	-112	Closed		
2011	6					5.45	2008	2009	201	-113	Closed		
2012	6					5.45	2009	2010	201	-110	Closed	4.97	
2016	5					6.54	2010	2011	201	-110	Closed	10.65	
							2011	2012	201	-110	Closed	15.91	
							2012	2013	201	-110	Closed		
							2013	2014	300	-218	Closed		
							2014	2015	299	-217	Closed		
							2015	2016	200	-217	Closed	2 /7	9 75

1SW = One Sea Winter ; CL= Conservation Limit.

This survey, the fourth of this catchment in the 2007 to 2016 period, was carried out during August 2016. The survey comprised 5 sites, all of which were included in the analysis. Salmon fry were present at 3 sites. The maximum fry catch was 7 salmon at site 6. The mean catch of included sites was 3.47 salmon fry/5min. The proportion of large fry present was high.

The Owenduff had a mean catch of 3.47 salfry/5min in 2016. Taking the four most recent surveys into account there is a cumulative average of 8.75 salmon fry/5min which is below the 17 salmon fry threshold. There has been a significant reduction in the average this year in comparison to the most recent previous survey.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	S 78254 21574	2	2	0	Include	0.00
002	S 78991 22464	2	2	6	Include	6.00
004	S 79082 19328	3	1	0	Include	0.00
005	S 81008 16602	3	1	4	Include	4.33
006	S 82060 14540	3	1	7	Include	7.00

Table A.J.J.J. Jile Specific results of ewell off the owerhout catchine in 2010.	Table A.3.3.3: Site s	pecific results of CWEF on	the Owenduff catchment in 2016.
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Map A.3.3.1: Showing locations of 2016 survey sites on the Owenduff River.

A.3.4. River Nore

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: Noel Power Tony Byrne 38 3/8/16 - 30/8/16 11.53 fry/5min. 15.18 fry/5min.

Fish Species Present:

Brown Trout	Minnow
Dace	Salmon
European Eel	Stoneloach
Margaritifera	3-Spined Stickleback

Figure A.3.4.1: Length distribution of salmon captured in 2016 CWEF survey on the Nore Catchment.



Figure A.3.4.2: Comparison of mean salmon fry/5min for all surveys on the Nore catchment to 2016.



Table A.3.4.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.3.4.2: Conservation limits and provisional returns on the Nore catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sample	Km per Included Sit	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry 5min	Mean Salmon Fry 5min
 2010	97	5			0 . 1	0 10.78	2007	2008	11958	-2106	Onen	<u> </u>	`
2016	95	5	7	18	-	9.25	2008	2000	11958	-2255	Open		
							2009	2010	11958	464	Open	18.83	
							2010	2011	11958	2276	Open		
							2011	2012	11958	3499	Open		
							2012	2013	11958	4815	Open/C&R		
							2013	2014	10467	5548	Open/C&R		
							2014	2015	10464	2214	Open/C&R		
							2015	2016	10464	-808	C& B	11 53	15 18

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

This survey, the second of this large catchment in the 2007 to 2016 period, was carried out during Sept 2016. The survey comprised 120 sites, 95 of which were included in the analysis. Salmon fry were present at 68 sites. The maximum fry catch was 75 salmon at site 55. The mean catch of included sites was 11.53 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm; the maximum size of juvenile salmon present was extremely large at 18cm.

The Nore had a mean catch of 11.53 salfry/5min in 2016. Taking the five most recent surveys into account there is a cumulative average of 15.18 salmon fry/5min which is below the 17 salmon fry threshold. There has been a slight reduction in the overall CWEF value this year in comparison to the previous survey.

C:4-		Character	D:61-	Salmon		Colmon
Sile	Grid Ref.	Stream	Rine	Fry	Site Stat	us Factoria
Number		Order	Grade	Captured		Fry/5min
005	S 36809 20669	3	1	0	Include	0.00
006	S 36793 21323	3	2	35	Include	50.00
007	S 32957 22733	2	2	2	Include	2.44
008	S 30306 22679	3	2	7	Include	7.00
009	S 29350 20092	3	1	21	Include	28.24
010	R 90063 12385	2	1	10	Include	11.15
012	R 90231 12494	3	2	0	Include	0.00
013	R 91928 12647	3	2	0	Include	0.00
014	R 92981 11843	3	1	7	Include	8.67
015	R 95209 13035	4	1	15	Include	18.53
016	R 98003 13182	4	- 1	10	Include	11 67
017	R 95132 16961	3	1	14	Include	16.33
018	R 95408 18023	4	1	9	Include	11.05
019	R 97083 19566	3	2	10	Include	12.65
020	R 96376 20368	3	3	1	Include	1 43
021	R 98638 17482	4	3	2	Include	2.00
022	R 94246 18170	4	1	12	Include	12.00
022	R 93115 18773	4	1	2	Include	2 31
023	R 91091 17837		1	2	Include	2.51
024	R 91091 17637	3	2	2	Include	2.40
025	S 00/10 1/0/7	4	2	2	Include	2.40
020	S 00419 14047	4	1	10	Include	10.00
027	5 00455 15022 5 02206 14226	4 E	1	10	Include	10.00 E 00
028	5 05200 14520	2	2	3	Include	3:00
029	5 03568 14074	3	1	4	Include	4.00
031	5 03640 13338	2	1	10	Include	11.88
032	5 07829 12107	3	3	0	Include	0.00
033	5 07814 11223	3	1	/	Include	8.27
034	5 08855 13612	5	2	4	Include	5.60
035	S 11637 13600	3	1	8	Include	8.00
036	\$ 11341 13971	5	1	0	Include	0.00
037	5 12897 13421	3	1	26	Include	26.00
039	\$ 25009 13933	4	3	0	Include	0.00
040	S 241// 14096	4	2	3	Include	4.50
041	S 23789 14374	3	3	0	Include	0.00
042	S 26937 12655	4	3	5	Include	6.43
043	S 21413 13495	4	3	6	Include	8.00
045	S 18574 13456	4	1	12	Include	14.40
046	S 16513 13518	4	1	15	Include	17.65
047	S 15225 18303	3	1	13	Include	16.71
048	S 17337 19271	3	2	0	Include	0.00
049	S 18638 18914	3	2	0	Include	0.00
050	S 03794 62079	3	2	9	Include	10.64
051	S 04142 62077	4	1	37	Include	41.54
052	S 02304 63813	4	2	31	Include	35.13
053	S 31533 35511	4	2	0	Include	0.00
054	S 26692 35192	4	1	14	Include	18.67
055	S 25407 33367	4	1	17	Include	22.00
056	S 27246 34579	2	1	0	Include	0.00
057	S 24628 31701	4	1	12	Include	15.43
058	S 24898 25260	5	1	15	Include	19.00
061	S 33022 37335	3	2	1	Include	1.00
062	S 28286 40965	3	1	0	Include	0.00
063	S 33435 38915	2	2	0	Include	0.00
064	S 13806 74292	3	2	4	Include	6.40
065	S 12400 77703	3	1	26	Include	30.00
066	S 12629 78940	2	0	4	Include	5.78

Table A.3.4.3: Site specific results of CWEF on the Nore catchment in 2016.

Site		Stream	Riffle	Salmon			Salmon
Number	Grid Ref.	Order	Grade	Fry		Site Status	Fry/5min
067	5 00420 78220	2		Captured	Includo		0.00
067	5 09439 78220 S 23875 31007	3	2	15	Include		0.00
069	S 22648 33954	4	1	17	Include		23.65
071	S 21870 28686	3	2	0	Include		0.00
072	S 23101 28001	3	0	0	Include		0.00
073	S 24403 28017	3	2	0	Include		0.00
074	S 03242 56527	4	3	7	Include		7.64
075	S 01665 59255	4	1	32	Include		35.37
076	R 98598 60351	3	1	14	Include		15.56
077	R 97422 59363	3	1	1	Include		1.14
078	R 98662 60764	3	1	7	Include		8.00
079	S 19021 61254	3	3	/	Include		8.08
080	5 10247 457 18 5 06074 42820	2	1	29	Include		0.00
082	S 07143 44143	3	2	28	Include		0.00
083	R 88214 35267	3	3	0	Include		0.00
084	R 95577 33090	4	1	5	Include		5.71
085	R 92347 33763	4	1	2	Include		2.00
086	S 12282 70513	3	1	14	Include		14.00
087	S 08270 72209	2	1	10	Include		12.07
089	R 80459 23527	3	2	20	Include		21.67
090	R 80586 30291	2	1	12	Include		12.00
091	R 79976 27753	2	2	0	Include		0.00
092	R 84664 27702	3	2	2	Include		2.36
093	R 87288 29365	4	1	4	Include		5.14
094	R 93005 29950 R 80461 23387	3	1	21	Include		23.71
096	R 80483 20967	2	1	4	Include		4.00
097	R 99105 41271	5	2	19	Include		23.00
098	R 98673 44951	5	0	12	Include		13.26
099	R 98392 40901	4	2	24	Include		28.00
100	R 92692 48445	3	1	15	Include		17.21
101	R 99432 51177	4	2	8	Include		9.14
102	R 97775 48801	3	1	0	Include		0.00
103	R 99008 48195	4	1	12	Include		13.45
104	R 99548 52242	2	0	6	Include		6.77
105	S 00017 54308	4	1	11	Include		13.12
100	R 91870 45119 R 91055 /9183	4	1	17	Include		22.10
107	R 91982 50734	2	0	18	Include		21.46
109	R 91286 47924	4	2	10	Include		17.00
110	R 91899 53049	4	0	7	Include		8.52
111	R 92425 53457	4	1	22	Include		23.47
112	R 97290 57147	2	1	0	Include		0.00
113	S 02356 55926	2	2	0	Include		0.00
114	S 03117 66849	2	2	2	Include		2.24
115	S 04838 63539	4	1	0	Include		0.00
116	S 01669 65254	2	2	0	Include		0.00
117	5 06/07 57930	3	1	0 22	Include		0.00
110	S 33401 31605	3	2	22	Include		0.00
122	S 40720 31115	3	2	13	Include		16.25
123	S 37060 30592	3	1	16	Include		22.10
124	S 41858 29447	4	2	0	Include		0.00
125	S 41501 26829	4	2	1	Include		1.40
126	S 41326 24412	4	1	11	Include		16.08
127	S 34954 15026	4	1	11	Include		11.00
128	S 35187 13724	5	1	16	Include		16.00
129	S 36296 12179	3	1	14	Include		16.67
130	5 38315 14107	5	1	2	Include		2.00
131	5 350/1 11557	2	3	4	Include		5.71
132	5 40181 14663 5 4000E 14000	5	1	21	Include		25.38
133	3 42083 14882 S <u>aa</u> 890 155 <i>aa</i>	5	1 2	14 5	Include		18.94 5 00
135	5 44050 15544 S 46845 15005	5	2	5	Include		5.00 5.00
136	S 30811 14953	3	3	0	Include		0.00
137	S 32194 16333	3	1	9	Include		9.00
138	S 32862 16425	4	1	14	Include		17.73

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
139	S 34396 15854	4	1	18	Include	20.57
038	S 15187 13697	4	1	10	Efficiency below 60%	
044	S 19943 12712	3	2	1	Efficiency below 60%	
059	S 24805 28032	5	1	4	Efficiency below 60%	
060	S 24446 23253	5	2	1	Efficiency below 60%	
070	S 19890 36330	4	3	7	Efficiency below 60%	
088	S 10715 71790	3	1	5	Efficiency below 60%	
011	R 88894 11586	1	2	2	Stream order<2	
030	S 02959 12763	1	2	0	Stream order<2	
120	S 33532 32029	1	2	9	Stream order<2	
002	S 36576 26337	3	3	0	Not Sampled	
001	S 35219 28037	2	1	0	access issues?	
121	S 35595 32438	3	2	2	better site just ds	
003	S 39277 24414	3	3	0	Poor Habitat	
004	S 39789 22363	3	3	0	Poor Habitat	



Map A.3.4.1: Showing locations of 2016 survey sites on the Nore River

A.3.5. River Suir including the Lingaun, Clodiagh, Glen and Waterford Blackwater

IFI Salmon Catchment #: 2016 survey dates: Mean Salmon Fry/5 min (2016): CWEF Index: 43 19/7/16 – 17/8/16 10.27 fry/5min. 10.27 fry/5min.

Sampling carried out by: John Flynn Noel C Power Michael Byron McKennedy Tony Holmes

Figure A.3.5.1: Length distribution of salmon captured in

Fish Species Present:

Brown Trout Crayfish European Eel Lamprey Minnow Salmon Sea Trout Stoneloach 3-Spined Stickleback



Table A.3.5.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.3.5.2: Conservation I	imits and	provisional	returns on
the Suir catchment along wit	th the 201	6 CWEF fish	ning result.

Mean Salmon Frv/ smii Annual Salmon Salmon

10.27

10.27

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status
2016	125	6	3	4	1		2007	2008	15098	-3968	Open/C&R
							2008	2009	15098	-3094	Open/C&R
							2009	2010	16117	-2598	Open/C&R
							2010	2011	16461	-634	Open/C&R
							2011	2012	16461	2555	Open/C&R
							2012	2013	16807	1975	Open/C&R
							2013	2014	14051	2371	Open/C&R
							2014	2015	14048	-2449	C&R
							2015	2016	14048	-2763	C&R

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

This survey, the first CWEF survey of this catchment in the 2007 to 2016 period, was carried out during August and September 2016. Sampling was confined to tributaries and few main channel sites were sampled with exception of several in the upper reaches of the main channel. The survey comprised 139 sites, 125 of which were included in the analysis. Salmon fry were present at 102 sites. Abundance

values in the main channels of the tributaries was generally consistently high with fewer salmon fry recorded in the smaller streams. The maximum fry catch was 37 salmon at site 51. The mean catch of included sites was 10.27 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

Conclusion

The Suir had a mean catch of 10.27 sal fry/5min in 2016 which is below the 17 salmon fry threshold. Additional sampling in the main channel would be required to provide a comprehensive overview of salmon fry stocks. It is likely that overall abundance would be higher as high abundance values would be likely in the main channel.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry		Site Status	Salmon Fry/5min
005	6 2000 2000	2	1	Captured	المماريمام		0.00
005	5 36809 20669	3	1	0	Include		0.00
006	5 30/93 21323	3	2	35	Include		50.00
007	5 52957 22755	2	2	2	Include		2.44
008	5 20250 22079	э э	2	21	Include		7.00
009	5 29550 20092 D 00062 12295	3 2	1	21	Include		20.24
010	R 90005 12565 R 90731 12797	2	2	10	Include		11.13
012	R 90231 12494	2	2	0	Include		0.00
013	R 91928 12047	2	2 1	7	Include		0.00
014	R 92301 11043	3	1	15	Include		18 53
015	R 9209 13035	4	1	10	Include		11.53
017	R 95132 16961		1	10	Include		16.33
019	R 95/08 18023	3	1	14	Include		11.05
018	R 97083 19566	4	2	10	Include		12.67
020	R 96376 20368	3	2	10	Include		1/3
020	R 98638 17482	4	3	2	Include		2.00
022	R 94246 18170	4	1	12	Include		12.00
023	R 93115 18773	4	1	2	Include		2 31
024	R 91091 17837		1	- 1	Include		1 17
025	R 98504 15626	4	2	2	Include		2 40
026	S 00419 14047	4	3	1	Include		1.08
027	S 00435 13622	4	1	10	Include		10.00
028	S 03286 14326	5	2	5	Include		5.00
029	S 03568 14074	3	1	4	Include		4.00
031	S 03640 13338	2	1	10	Include		11.88
032	S 07829 12107	3	3	0	Include		0.00
033	S 07814 11223	3	1	7	Include		8.27
034	S 08855 13612	5	2	4	Include		5.60
035	S 11637 13600	3	- 1	. 8	Include		8.00
036	S 11341 13971	5	- 1	0	Include		0.00
037	S 12897 13421	3	1	26	Include		26.00
039	S 25009 13933	4	3	0	Include		0.00
040	S 24177 14096	4	2	3	Include		4.50
041	S 23789 14374	3	3	0	Include		0.00
042	S 26937 12655	4	3	5	Include		6.43
043	S 21413 13495	4	3	6	Include		8.00
045	S 18574 13456	4	1	12	Include		14.40
046	S 16513 13518	4	1	15	Include		17.65
047	S 15225 18303	3	1	13	Include		16.71
048	S 17337 19271	3	2	0	Include		0.00
049	S 18638 18914	3	2	0	Include		0.00
050	S 03794 62079	3	2	9	Include		10.64
051	S 04142 62077	4	1	37	Include		41.54
052	S 02304 63813	4	2	31	Include		35.13
053	S 31533 35511	4	2	0	Include		0.00
054	S 26692 35192	4	1	14	Include		18.67
055	S 25407 33367	4	1	17	Include		22.00
056	S 27246 34579	2	1	0	Include		0.00

Table A.3.5.3: Site specific results of CWEF on the Suir catchment in 2016.

Site		Stream	Riffle	Salmon			Salmon
Number	Grid Ref.	Order	Grade	Fry		Site Status	Frv/5min
				Captured			,.
057	S 24628 31701	4	1	12	Include		15.43
058	5 24898 25260	5	1	15	Include		19.00
061	5 33022 37335	3	2	1	Include		1.00
063	S 33435 38915	2	2	0	Include		0.00
064	S 13806 74292	3	2	4	Include		6.40
065	S 12400 77703	3	1	26	Include		30.00
066	S 12629 78940	2	0	4	Include		5.78
067	S 09439 78220	3	2	0	Include		0.00
068	S 23875 31007	4	1	15	Include		20.63
069	S 22648 33954	4	1	17	Include		23.65
071	S 21870 28686	3	2	0	Include		0.00
072	S 23101 28001	3	0	0	Include		0.00
073	S 24403 28017	3	2	0	Include		0.00
074	S 03242 56527	4	3	7	Include		7.64
075	S 01665 59255	4	1	32	Include		35.37
078	R 90390 00331	3	1	14	Include		15.50
078	R 98662 60764	3	1	1	Include		1.14 8.00
079	S 19021 61254	3	3	, 7	Include		8.08
080	S 10247 45718	2	1	0	Include		0.00
081	S 06074 43829	3	1	28	Include		34.13
082	S 07143 44143	3	2	0	Include		0.00
083	R 88214 35267	3	3	0	Include		0.00
084	R 95577 33090	4	1	5	Include		5.71
085	R 92347 33763	4	1	2	Include		2.00
086	S 12282 70513	3	1	14	Include		14.00
087	S 08270 72209	2	1	10	Include		12.07
089	R 80459 23527	3	2	20	Include		21.67
090	R 80586 30291	2	1	12	Include		12.00
091	R 79970 27703 P 84664 27702	2	2	0	Include		0.00
092	R 87288 29365	З Д	2	2	Include		5 14
094	R 93065 29950	3	1	21	Include		23.71
095	R 80461 23387	3	1	4	Include		4.00
096	R 80483 20967	2	1	0	Include		0.00
097	R 99105 41271	5	2	19	Include		23.00
098	R 98673 44951	5	0	12	Include		13.26
099	R 98392 40901	4	2	24	Include		28.00
100	R 92692 48445	3	1	15	Include		17.21
101	R 99432 51177	4	2	8	Include		9.14
102	R 97775 48801	3	1	0	Include		0.00
103	R 99008 48195	4	1	12	Include		13.45
104	S 00017 54308	2 A	1	11	Include		13 12
106	R 91870 45119	4	1	17	Include		22.10
107	R 91055 49183	2	1	0	Include		0.00
108	R 91982 50734	4	0	18	Include		21.46
109	R 91286 47924	4	2	11	Include		17.00
110	R 91899 53049	4	0	7	Include		8.52
111	R 92425 53457	4	1	22	Include		23.47
112	R 97290 57147	2	1	0	Include		0.00
113	S 02356 55926	2	2	0	Include		0.00
114	S 03117 66849	2	2	2	Include		2.24
115	S 04838 63539	4	1	0	Include		0.00
110	5 01009 05254 S 06707 57020	2	2	0	Include		0.00
118	S 36157 32553	3	1	22	Include		35.20
119	S 33401 31605	3	2	0	Include		0.00
122	S 40720 31115	3	2	13	Include		16.25
123	S 37060 30592	3	1	16	Include		22.10
124	S 41858 29447	4	2	0	Include		0.00
125	S 41501 26829	4	2	1	Include		1.40
126	S 41326 24412	4	1	11	Include		16.08
127	S 34954 15026	4	1	11	Include		11.00
128	S 35187 13724	5	1	16	Include		16.00
129	S 36296 12179	3	1	14	Include		16.67
130	S 38315 14107	5	1	2	Include		2.00

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
131	S 35071 11557	2	3	4	Include	5.71
132	S 40181 14663	5	1	21	Include	25.38
133	S 42085 14882	5	1	14	Include	18.94
134	S 44890 15544	5	2	5	Include	5.00
135	S 46845 15005	5	3	5	Include	5.00
136	S 30811 14953	3	3	0	Include	0.00
137	S 32194 16333	3	1	9	Include	9.00
138	S 32862 16425	4	1	14	Include	17.73
139	S 34396 15854	4	1	18	Include	20.57
038	S 15187 13697	4	1	10	Efficiency below 60%	
044	S 19943 12712	3	2	1	Efficiency below 60%	
059	S 24805 28032	5	1	4	Efficiency below 60%	
060	S 24446 23253	5	2	1	Efficiency below 60%	
070	S 19890 36330	4	3	7	Efficiency below 60%	
088	S 10715 71790	3	1	5	Efficiency below 60%	
011	R 88894 11586	1	2	2	Stream order<2	
030	S 02959 12763	1	2	0	Stream order<2	
120	S 33532 32029	1	2	9	Stream order<2	
002	S 36576 26337	3	3	0	Not Sampled	
001	S 35219 28037	2	1	0	Access issues?	
121	S 35595 32438	3	2	2	better site just ds	
003	S 39277 24414	3	3	0	Poor Habitat	
004	S 39789 22363	3	3	0	Poor Habitat	





A.3.6.River Tay

IFI Salmon Catchment #:	51							
2016 survey date:	29/9/16							
Mean Salmon Fry/5 min (2016):	1.40 fry/5min.							
CWEF Index:	4.41 fry/5min.							
Sampling carried out by:	Fish Species Present:							
Tony Holmes	Brown Trout	Flounder						
Michael Byron	European Eel	Salmon						

Figure A.3.6.1: Length distribution of salmon captured in 2016 CWEF survey on the Tay Catchment.



Table A.3.6.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Figure A.3.6.2: Comparison of mean salmon fry/5min for all surveys on the Tay catchment to 2016.



 Table A.3.6.2: Conservation limits and provisional returns on

 the Tay catchment along with the 2016 CWEF fishing result.

rry year	Sites	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
201	1 6					6.85	2007	2008	278	-157	Closed		
201	.5 4	1				8.22	2008	2009	278	-157	Closed		
201	.6 5			2		5.87	2009	2010	278	-153	Closed		
							2010	2011	278	-153	Closed	8.75	
							2011	2012	278	-153	Closed		
							2012	2013	278	-153	Closed		
							2013	2014	318	-223	Closed		
							2014	2015	319	-223	Closed	3.07	
							2015	2016	319	-223	Closed	1 40	4 4 1

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

This survey, the third of this catchment in the 2007 to 2016 period, was carried out on 29th Sept 2016. The survey comprised 7 sites, 5 of which were included in the analysis. Salmon fry were present at 108 sites. The maximum fry catch was 5 salmon at site 3. The mean catch of included sites was 1.40 salmon fry/5min. The proportion of larger fry present was high.

The Tay had a mean catch of 1.40 salfry/5min in 2016. Taking the previous surveys into account there is a cumulative average of 4.41 salmon fry/5min which is below the 17 salmon fry threshold. There has been a declining trend in the average CWEF value recorded in each survey year.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	S 31980 03958	3	1	0	Include	0.00
003	S 34018 00477	4	0	5	Include	5.00
004	X 33967 98739	5	2	0	Include	0.00
006	X 36986 97130	5	2	0	Include	0.00
008	X 33600 99365	4	1	2	Include	2.00
007	S 30920 04995	3	3	0	Poor site	
002	S 33087 02640	3	0	0	Very Recent Work Instream	

Table A.3.6.3: Site specific results of CWEF on the Tay catchment in 2016.

Map A.3.6.1: Showing locations of 2016 survey sites on the Tay River.



A.3.7.River Colligan

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: Tony Holmes Michael Byron

Figure A.3.7.1: Length distribution of salmon captured in 2016 CWEF survey on the Colligan Catchment.



Table A.3.7.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

53
28/8/16 - 29/8/16
3.62 fry/5min.
14.15 fry/5min.

Fish Species Present:

Brown Trout European Eel Salmon

Figure A.3.7.2: Comparison of mean salmon fry/5min for all surveys on the Colligan catchment to 2016.



Table A.3.7.2: Conservation limits and provisional returns on the Colligan catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
2011	5					11.09	2007	2008	338	-136	C&R		
2014	12					4.62	2008	2009	338	-54	C&R		
2016	12			1		4.27	2009	2010	338	-49	C&R		
							2010	2011	338	-27	C&R	29.32	
							2011	2012	338	-8	C&R		
							2012	2013	338	117	C&R		
							2013	2014	423	-96	C&R	9.50	
							2014	2015	422	-78	C&R		
							2015	2016	422	-159	C&R	3.62	14.15

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

This survey, the third of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. The survey comprised 13 sites, 12 of which were included in the analysis. Salmon fry were present at 8 sites. The maximum fry catch was 13 salmon at site 10. The mean catch of included sites was 3.62 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm; the proportion of larger fry present was high.

The Colligan had a mean catch of 3.62 salfry/5min in 2016. Taking previous surveys into account there is a cumulative average of 14.15 salmon fry/5min which is below the 17 salmon fry threshold. There has been a declining trend in the average CWEF value recorded in each survey year.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	S 22978 04848	4	3	2	Include	2.00
003	X 22018 98113	4	2	1	Include	1.00
004	X 21476 97201	4	3	0	Include	0.00
005	X 23218 95146	4	1	12	Include	17.00
006	S 23254 02433	3	2	1	Include	1.30
007	S 21967 06452	2	2	0	Include	0.00
008	S 22893 04911	3	2	3	Include	4.00
009	S 24296 07508	2	3	0	Include	0.00
010	S 23063 02128	4	1	13	Include	13.00
011	S 23304 01187	4	2	3	Include	4.13
012	X 22132 98382	4	2	1	Include	1.00
013	X 24247 99778	2	1	0	Include	0.00
014	S 24816 03623	3	3	0	Water Too High	

Table A.3.7.3: Site specific results of CWEF on the Colligan catchment in 2016.





A.4.South Western Regional Fishery District

Summary

Since 2007, Forty salmon rivers have been surveyed in the South Western River Basin District as part of the on-going catchment-wide electrofishing surveys. These are presented in Table A.4. The Munster Blackwater (incorporating the Glanshelane and Finisk), Bandon, Croanshagh, Behy, Emlagh, Scorid, Glenahoo, Aghacashla, Owenamallagh, Meennascarty and Lee were surveyed in this district in 2016. Of those catchments only the Croanshagh has a CWEF index > 17 salmon fry. All CWEF values from previously surveyed catchments in 2016 were low in comparison to those of previous surveys.

					Survoy	Voar						# Annual
					Survey	Tear					Current	Surveys
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Index	Considered
055/Lickey		12.37							14.14		13.26	2
059/Blackwater (Munster)	22.72*	10.67*								13.45	13.45	3
060/Bride		10.40		24.70				19.85			<u>18.32</u>	3
061/Tourig						9.40					9.40	1
062/Womanagh		15.45						2.39			8.92	2
064/Owennacurra	15.76										15.76	1
066/Lower Lee (Cork)			0.26								0.26	1
069/Bandon										11.01	11.01	1
070/Argideen	17.15										<u>17.15</u>	1
077/Mealagh						12.82					12.82	1
080/Glengarriff			5.93								5.93	1
081/Adrigole							4.01	1.33			2.67	2
082/Kealincha	0.00								0.00		0.00	2
083/Lough Fada	3.23								1.68		2.45	2
084/Croanshagh										23.38	<u>23.38</u>	1
085/Owenshagh							4.32		6.73		5.53	2
086/Cloonee						16.18	33.06				<u>24.62</u>	2
088/Roughty					19.78						<u>19.78</u>	1
089/Finnihy						8.61	0.00				4.31	2
090/Blackwater (Kerry)	30.54	15.52	13.35					17.82			<u>19.31</u>	4
093/Owreagh	8.94						2.07	2.81			4.61	3
097/Currane								24.51			<u>24.51</u>	1
098/Inny	24.63		19.78								<u>22.20</u>	2
099/Emlaghmore	2.07								1.45		1.76	2
101/Carhan	15.76						6.05	8.61			10.14	3
102/Ferta	19.42							10.90			15.16	2
103/Behy	15.41	6.14	4.03	8.71	7.17					2.89	5.79	5
105/Cotteners		17.42									<u>17.42</u>	1
107/Maine	31.88	32.81	34.23								<u>32.97</u>	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			<u>18.76</u>	4
110/Owenalondrig			21.90								<u>21.90</u>	1
111/Milltown (Kerry)		15.33		26.44			13.02		8.76		15.89	4
112/Feohanagh			16.61				3.20	12.09			10.64	3
114/Owenmore (Kerry)	25.07										25.07	1
115/Scorid										1.86	1.86	1
115/Glenahoo										1.86	1.86	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			0.67	2

Table A.4.1: Catchment-wide Electrofishing data for the South Western River Basin District 2007-2016 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

Bold annual figures indicate years included in calculation of current CWEF index.

<u>**Underlined**</u> index figures indicate those exceeding the 17 salfry threshold.

* Incomplete surveys not included in calculation of current index.





A.4.1.River Blackwater (Munster), including the Glenshelane and the Finisk

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by:

Catherine Dwane Dave O'Donovan Mark Fanning Michael Millane Steven McKenna Tony Holmes 59 14/8/16 – 23/8/16 13.56 fry/5min. 13.56 fry/5min.

Fish Species Present:

- Brown Trout European Eel Lamprey Minnow
- Roach Salmon Stoneloach 3-Spined Stickleback



Figure A.4.1.1: Length distribution of salmon captured in

Table A.4.1.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.4.1.2: Conservation limits and provisional returns on the Blackwater catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
2016	254	18	20	31	4	3.69	2007	2008	11861	6892	Open		
							2008	2009	11502	7282	Open		
							2009	2010	12103	4095	Open		
							2010	2011	12103	4444	Open		
							2011	2012	12103	4667	Open		
							2012	2013	12103	3113	O/CR		
							2013	2014	12057	6630	O/CR		
							2014	2015	12024	6902	O/CR		
							2015	2016	12024	5752	O/CR	13.56	13.56

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

This is the first complete CWEF survey of this catchment in the 2007 to 2016 period. The survey was carried out during August and Sept 2016. Both the Glenshelane (2007&8) and Finisk (2008) have been surveyed independently in the past. The survey comprised 322 sites, 250 of which were included in the analysis; salmon fry were present at 203 of those. The maximum fry catch was 54 salmon at site 83 on the Araglin; Fry numbers were almost uniformly high at the top end of the catchment: the upper main channel, the Araglin, Owenaskirtaun, Finnow, Glen and Clydagh. Catchments lower down had lower salmon numbers and more sites with no salmon at all. The mean catch of included sites was 13.45 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

The Blackwater had a mean catch of 13.56 salfry/5min in 2016 which is below the 17 salmon fry threshold. A detailed CWEF survey report has been prepared which presents individual tributary results and a comprehensive analysis.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry	Site Status	Salmon Fry/5min
				Captured		
001	W 97516 99023	6	1	0	Include	0.00
002	W 99458 98941 V 01812 00011	3	2	2	Include	2.00
003	X 01612 99011 X 04608 98790	6	2	0	Include	0.00
005	W 99589 99256	3	2	7	Include	7.00
006	S 03694 07159	3	3	0	Include	0.00
007	S 04785 05177	3	2	8	Include	9.78
008	S 04660 04208	3	2	1	Include	1.00
009	S 04633 03064	3	2	0	Include	0.00
011	S 06201 05711	3	3	0	Include	0.00
012	S 06380 04928	3	3	0	Include	0.00
013	S 06462 03106	3	3	12	Include	19.06
014	S 05256 01615	3	2	6	Include	6.00
015	X 04407 99976	4	2	7	Include	9.00
016	X 04748 99022	4	2	3	Include	4.50
017	S 04515 01556	4	2	5	Include	5.00
018	S 08633 03283	2	2	0	Include	0.00
019	S 10078 02270	2	2	0	Include	0.00
020	S 10778 01137	3	2	4	Include	4.00
021	S 10873 05144	2	2	0	Include	0.00
022	S 10967 03643	3	3	3	Include	4.80
023	S 12943 05968	2	3	0	Include	0.00
024	S 125/9 044/7	2	3	0	Include	0.00
026	S 11542 01078	3	2	3	Include	3.00
027	X 11900 99337 X 12026 04950	4	2	14	Include	14.00
029	X 13020 94639 X 14412 95160	4	1	0	Include	0.00
030	X 14412 95100 X 15490 95618	4	1	5	Include	5.00
032	X 16457 96888	4	1	5	Include	5.00 8.00
033	X 17800 97513	4	1	2	Include	2.00
034	X 17682 98386	4	1	1	Include	1.00
035	X 17571 99256	4	1	3	Include	5.00
036	S 17271 01153	4	1	4	Include	4.73
037	S 16992 01441	3	1	1	Include	1.18
038	S 18683 03976	4	2	13	Include	17.64
039	S 18670 05168	4	2	0	Include	0.00
040	S 17829 04448	3	3	0	Include	0.00
041	X 15835 98158	2	3	0	Include	0.00
042	S 15866 02205	3	2	0	Include	0.00
044	S 17418 07157	3	1	2	Include	2.38
045	S 18378 06328	4	1	5	Include	5.00
048	R 14485 06710	3	1	7	Include	9.92
049	R 13635 07408	2	2	2	Include	2.33
050	R 14908 05271	3	1	31	Include	33.74
051	R 15214 03742	3	2	8	Include	12.00
052	R 15/95 05549	3	1	11	Include	14.00
053	R 15014 02510 P 15216 00608	2	1	23	Include	52.09 20.57
055	R 14230 00369	2	1	10	Include	20.37
056	W 15185 99994	2	1	31		35 56
058	W 15663 99040	3	1	43	Include	57.66
059	W 15551 99115	3	1	15	Include	25.00
060	W 16031 97411	3	1	30	Include	45.00
061	W 16075 97913	3	1	36	Include	51.00
062	W 16189 95685	2	1	30	Include	39.09
063	W 18488 97896	2	2	13	Include	14.86
064	W 18674 97623	2	2	28	Include	31.89
065	W 17213 95867	2	1	31	Include	31.00

Table A.4.1.3: Site specific results of CWEF on the Blackwater catchment in 2016.

Site	Grid Ref.	Stream	Riffle	Salmon	Site Status	Salmon
Number		Order	Grade	Fry		Fry/5min
066	W/ 17192 0E7E6	2	1	Captured	Include	22.22
060	W 17182 95750	3	1	17	Include	22.37
068	W 17202 94945 W 17091 93436	3	2	26	Include	35.29
070	W 13965 92125	3	3	10	Include	10.00
071	W 18725 92529	3	2	30	Include	35.00
072	W 16997 91030	3	1	51	Include	71.00
073	W 16586 90521	3	3	5	Include	7.14
075	W 18051 93095	4	1	22	Include	36.35
076	W 20239 92836	4	3	19	Include	10.80
077	W 22154 93571 R 19391 07940	3	1	18	Include	22.74
079	R 19449 06619	4	1	25	Include	29.07
080	R 19878 05089	4	1	50	Include	59.62
081	R 20229 03468	4	1	16	Include	22.40
082	R 21219 02620	4	1	17	Include	25.95
083	R 21903 01213	4	1	54	Include	67.97
084	W 22486 99788	4	3	21	Include	30.55
085	W 22775 99240	4	2 1	23	Include	27.00
087	W 23422 95973	4	1	19	Include	23.75
088	W 22537 94924	4	3	12	Include	13.00
089	W 22401 94333	4	3	7	Include	7.00
091	W 19698 90933	2	2	8	Include	10.35
092	W 20154 91793	2	2	27	Include	33.59
093	W 22937 90894	3	1	13	Include	15.05
094	W 22185 89414	2	2	11	Include	11.00
095	W 24970 87222 W 26859 87867	2	2	19	Include	17.89
097	W 26809 89966	3	2	29	Include	38.06
098	W 26690 92052	4	2	28	Include	28.00
099	W 27853 90340	2	3	0	Include	0.00
100	W 28353 92429	4	1	41	Include	56.00
101	W 26883 92763	5	1	33	Include	40.50
103	W 24861 94397	5	1	34	Include	47.78
105	W 30780 88203 W 31615 91645	3	2 1	27	Include	30.97
100	W 33568 93310	3	3	17	Include	17.00
108	W 35080 92812	3	1	9	Include	10.93
109	W 35040 91313	3	1	26	Include	34.39
111	W 34236 90833	3	1	13	Include	14.18
112	W 33343 89543	2	1	1	Include	1.00
115	W 42391 90845	3	1	6	Include	6./5 22.20
110	W 43504 89598	2	2	20	Include	23.20
118	W 43876 89013	2	2	26	Include	30.33
119	W 43578 90627	3	2	22	Include	26.58
121	W 40306 94420	4	1	22	Include	26.07
122	W 39151 95893	4	2	20	Include	26.96
123	W 39363 98310	4	2	14	Include	17.29
124	R 28184 13491	3	1	18	Include	20.08
125	R 29046 16551	2	2	0	Include	0.00
127	R 42854 01276	4	2	1	Include	1.00
128	W 43940 99157	4	2	2	Include	2.00
129	R 49781 00278	2	2	0	Include	0.00
130	W 50502 99267	3	3	1	Include	1.00
131	W 51119 86872	2	1	8	Include	8.83
132	K 28/29 11955	5 ว	1	10	Include	10.00
135	R 26111 10878	5 2	1	72	Include	15.44 20 12
136	R 26047 09742	2	1	19	Include	21.19
138	R 26828 08626	3	3	6	Include	7.06
139	R 23840 07717	3	2	22	Include	22.00
140	R 22942 08102	3	2	16	Include	17.60
141	R 24274 07010	3	1	24	Include	25.92
142	R 23555 06393	2	1	8	Include	10.00
144	R 25097 06357	3	1	13	Include	15.60
140	N 30373 07840	Э	U	Э	Include	10.38

Site	Grid Ref.	Stream	Riffle	Salmon	Site Status	Salmon
Number		Order	Grade	Fry		Fry/5min
146	P 20/10 10116	2	1	Captured	Includo	11 50
140	R 29410 10110 R 29956 08399	3	1	8	Include	11.50
148	R 27953 07182	3	1	25	Include	30.83
149	R 29932 07477	3	1	14	Include	19.89
150	R 30903 06939	4	1	21	Include	21.00
151	R 29743 04863	3	1	13	Include	17.11
152	R 32454 04549	4	1	10	Include	10.00
154	R 34100 04449	4	1	15	Include	23.82
155	R 28501 05217	3	1	16	Include	19.05
150	R 38249 03088 R 36352 04390	4	1	10	Include	11.33
158	R 31313 16432	3	1	9	Include	10.64
161	R 34588 15453	3	1	12	Include	14.25
162	R 36947 15764	3	2	16	Include	23.20
163	R 37780 15691	3	2	9	Include	11.25
165	R 39532 11750	3	3	9	Include	9.00
166	R 39480 09814	3	2	13	Include	17.64
167	R 39617 08158	3	1	24	Include	32.00
169	R 38528 05529	3	2	4 10	Include	15.00
170	R 38196 04049	3	2	16	Include	20.80
171	R 35213 06550	3	2	9	Include	11.08
172	R 34612 08539	3	1	17	Include	20.78
173	R 33190 11075	3	2	8	Include	10.86
174	R 32698 02410	2	1	0	Include	0.00
175	R 35926 02396	2	2	0	Include	0.00
176	R 37402 02337 R 3828/ 01906	2	2	0	Include	0.00
178	W 38485 98975	4	1	11	Include	17.88
179	W 43116 98863	5	1	13	Include	20.65
180	W 44291 98825	5	1	12	Include	15.69
181	W 38250 98762	5	1	22	Include	29.65
182	W 52998 87894	2	1	3	Include	4.05
183	W 54304 88648	2	2	17	Include	23.80
184	W 54967 89239	3	2	12	Include	16.00
185	W 56343 91038	3	2	9	Include	12.30
187	W 56762 92203	4	2	35	Include	49.58
188	W 53297 92479	3	1	7	Include	10.29
189	W 55565 93089	3	2	10	Include	12.67
191	W 58709 90142	3	2	12	Include	14.40
192	W 58181 90496	4	2	7	Include	7.56
193	W 57958 91159	4	1	17	Include	24.73
194	W 54282 95910	4	1	21	Include	28.00
197	W 53944 97469	4	1	11	Include	14.00
200	W 64846 99777	5	1	6	Include	6.00
202	W 63900 96393	3	3	8	Include	9.14
203	W 64698 98557	3	2	5	Include	6.67
204	W 64896 99471	3	1	15	Include	18.53
209	R 55466 19913 P 52282 16741	3	3	6	Include	6.00 5.00
210	R 52251 14991	4	3	0	Include	0.00
213	R 52813 14347	4	3	1	Include	1.00
216	R 54412 09298	4	2	1	Include	1.00
217	R 54528 07878	4	3	0	Include	0.00
218	R 56705 08225	4	2	2	Include	2.00
219	R 59703 08171	2	2	0	Include	0.00
221	K 59592 U/8/4 R 62602 08102	4	2	10	Include	11.82
222	R 64363 10382	२ २	1 2	19	Include	12.38 24.18
224	R 65147 12954	3	2	1	Include	1.38
225	R 64798 11335	3	1	12	Include	13.20
229	W 77481 98182	3	2	20	Include	24.17
230	W 76954 97506	2	2	10	Include	12.67
231	W 75705 97097	2	1	21	Include	24.50
232	W 74453 96676	2	2	5	Include	7.50
233	vv /3/65 95921	۷	2	5	inciude	5.59
Site	Grid Ref.	Stream	Riffle	Salmon	Site Status	Salmon
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Number		Order	Grade	Fry		Fry/5min
235	W 66754 99204	2	2	Captured	Include	8.00
235	W 58888 98215	2	1	9	Include	11.25
237	W 46378 96617	4	1	23	Include	32.86
240	W 46664 95994	4	1	13	Include	16.42
242	W 32293 97412	3	1	12	Include	18.00
243	W 30792 98109	3	2	11	Include	11.00
245	W 30158 99190	3	1	14	Include	19.25
240	W 29122 90985	3	3	15	Include	2.00
248	W 32865 95503	5	1	42	Include	65.86
250	R 88050 18806	4	1	1	Include	1.67
252	R 87229 11609	2	1	0	Include	0.00
254	R 86615 17234	3	2	4	Include	6.50
255	R 84891 16450	3	2	0	Include	0.00
257	R 82487 17836	3	1	0	Include	0.00
258	R 826/3 1643/ P 81615 16120	3 2	1	0	Include	0.00
260	R 80683 17739	2	2	0	Include	0.00
261	R 80777 14873	2	1	0	Include	0.00
265	R 82451 12909	4	2	0	Include	0.00
269	R 72250 17462	3	1	0	Include	0.00
270	R 68408 17592	3	1	3	Include	4.80
271	R 67699 18165	3	1	1	Include	1.60
272	R 74495 20017	4	2	0	Include	0.00
273	R 71113 11452 R 72293 11064	2	1	0	Include	0.00
279	R 67015 12282	2	1	0	Include	0.00
280	R 67659 11581	2	1	0	Include	0.00
281	R 77170 09385	2	2	0	Include	0.00
282	R 75899 06932	5	2	1	Include	1.33
283	R 78792 03631	3	1	0	Include	0.00
284	R 71117 08983	2	1	1	Include	1.67
280	R 78789 03023 R 84324 04659	3	1	0	Include	0.00
292	R 84056 03971	3	1	0	Include	0.00
293	R 87462 02037	4	1	4	Include	4.00
294	R 88598 04725	3	1	1	Include	1.00
295	R 88652 04640	4	1	5	Include	5.00
296	R 94616 05978	3		13	Include	13.00
297	R 98035 06165	3	1	3	Include	4.50
300	R 91336 05382	2	1	0	Include	0.00
301	R 90666 06013	4	1	2	Include	2.73
303	R 88444 05743	3	1	3	Include	3.75
305	R 87585 02007	2	1	7	Include	8.40
306	R 84955 01584	4	1	4	Include	6.55
308	R 89077 01903	2	1	3	Include	3.86
309	R 90547 01284	2	1	/	Include	7.00
312	R 73785 16771	4	1	5	Include	7 67
313	R 73989 16839	4	1	4	Include	6.29
314	R 74939 11770	5	1	5	Include	7.69
315	R 72029 09583	5	1	4	Include	5.60
316	R 73766 06819	5	1	1	Include	1.27
317	R 75886 03946	5	1	0	Include	0.00
319	W /3000 98/24	5	2	2	Include	2.00
074	W 16988 88392	2	1	25	Efficiency below 60%	12.07
104	W 27519 88749	3	- 3	10	Efficiency below 60%	
190	W 57537 91751	4	1	19	Efficiency below 60%	
195	W 54672 94927	4	1	15	Efficiency below 60%	
198	W 56258 97955	5	1	14	Efficiency below 60%	
249	W 29868 93556	5	0	17	Efficiency below 60%	
251	R 87547 15073	4	1	2	Efficiency below 60%	
253	R 80748 14700	3 1	1	1U 1		
263	R 85697 15835	4	2	т 5	Efficiency below 60%	
266	R 80633 14274	4	1	5	Efficiency below 60%	

Site	Grid Ref.	Stream	Riffle	Salmon	Site Status	Salmon
Number		Order	Grade	Fry		Fry/5min
				Captured		
285	R 69238 10239	2	1	2	Efficiency below 60%	
289	R 84604 05265	2	1	2	Efficiency below 60%	
290	R 84590 05271	2	1	3	Efficiency below 60%	
299	R 92796 06011	3	1	2	Efficiency below 60%	
302	R 90186 05216	4	1	1	Efficiency below 60%	
310	R 84990 00588	4	1	6	Efficiency below 60%	
318	R 79258 02997	5	1	1	Efficiency below 60%	
238	W 46520 95356	3	1	0	Above Barrier	
239	W 46458 95294	3	2	0	Above Barrier	
241	W 46967 94502	3	2	0	Above Barrier	
110	W 35532 90904	2	1	0	Above Barrier?	
057	W 16022 99680	1	1	34	Stream order<2	
069	W 14555 93417	1	2	21	Stream order<2	
102	W 24704 91712	1	1	21	Stream order<2	
143	R 21970 06533	1	1	0	Stream order<2	
159	R 32188 16787	1	1	8	Stream order<2	
160	R 31148 18077	1	1	11	Stream order<2	
228	W /3004 9853/	1	1	14	Stream order<2	
234	W 6/486 98/12	1	3	1	Stream order<2	
250	R 83896 16347	1	1	0	Stream order<2	
204	R 83480 12192	1	1	0	Stream order <2	
207	K 78700 13742	1	2	0	Stream order<2	
200	R 70115 15054 P 71576 12412	1	2	0	Stream order<2	
274	R 71570 15412	1	2 1	0	Stream order<2	
273	R 72409 14000 P 72212 12205	1	1	0	Stream order<2	
277	R 67857 12854	1	2	0	Stream order<2	
287	R 81478 03160	1	1	1	Stream order<2	
288	R 82703 06329	1	2	0	Stream order<2	
304	R 88302 05703	1	1	7	Stream order<2	
307	R 89062 02000	- 1	2	1	Stream order<2	
227	R 68568 02375	4	3	2	Water Too High	
215	R 47443 12965	3	0	0	Water Too Low	
200	W 64846 99777	5	1	0	Exclude	
010	S 03554 02923	2		0	Not Sampled	
025	S 12963 04106	1	0	0	Not Sampled	
046	S 19508 05391	2	0	0	Not Sampled	
226	R 59781 09276	2	0	0	Not Sampled	
028	X 12265 95285	4	0	0	Habitat Unsuitable	
043	S 19742 03928	3	3	0	Habitat Unsuitable	
090	W 21045 90160	2	3	0	Habitat Unsuitable	
120	W 43121 92888	4	0	0	Habitat Unsuitable	
137	R 25430 09252	2	2	0	Habitat Unsuitable	
153	R 33720 04878	2	2	6	Habitat Unsuitable	
164	R 39463 13460	3	3	8	Habitat Unsuitable	
199	R 61884 00170	2	3	0	Habitat Unsuitable	
201	W 64949 99998	2	3	0	Habitat Unsuitable	
205	R 57610 20825	3	3	6	Habitat Unsuitable	
206	R 59344 21144	3	3	2	Habitat Unsuitable	
207	R 59189 19729	2	2	0	Habitat Unsuitable	
208	к 58093 19169	2	2	Ű	Habitat Unsuitable	
212	R 46169 13746	3	3	U	Habitat Unsuitable	
214	K 44953 13182	3	0	0		
220	K 23017 01808	2	5	1		
244	VV 23824 33808	2	3 7	I I		
113	VV 3/0UZ 8/323	2	2	0	Probably above Salmon	
124	N 20032 00227 R 20516 00921	2	5 1	0	Water Too East	
145	R 30373 07846	2	2	5 7	Water Too Fast	
140		5	~	,		





A.4.2.River Bandon

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by:

Catherine Dwane Dermot Long Jason Nash Michael Millane Steven McKenna Tony Holmes 69 20/7/16 - 23/9/16 11.01 fry/5min. 11.01 fry/5min.

Fish Species Present:

Brown Trout European Eel Minnow

Salmon Stoneloach 3-Spined Stickleback



Figure A.4.2.1: Length distribution of salmon captured in 2016 CWEF survey on the Bandon Catchment.

Table A.4.2.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.4.2.2: Conservation limits and provisional returns on
the Bandon catchment along with the 2016 CWEF fishing
result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon	Mean Salmon
2016	83	3		11		3.19	2007	2008	-	-	Open		
							2008	2009	1555	1195	Open		
							2009	2010	1742	1512	Open		
							2010	2011	1742	512	Open		
							2011	2012	1742	455	Open		
							2012	2013	1742	925	Open		
							2013	2014	1630	1162	Open		
							2014	2015	1630	748	Open		
							2015	2016	1630	1360	Open	11 01	11 01

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

This survey, the first CWEF of this catchment in the 2007 to 2016 period, was carried out between July and September 2016. The survey comprised 92 sites, 83 of which were included in the analysis. Salmon fry were present at 67 sites. The maximum fry catch was 35 salmon at site 41. As observed for a similar survey of the Munster Blackwater in 2016 salmon fry abundance was highest in the middle and upper reaches, mainly on the main channel and larger tributaries. The mean catch of included sites was 11.01 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

The Bandon had a mean catch of 11.01 sal fry/5min in 2016 which is below the 17 salmon fry threshold. For management investigation of the channels in the lower reaches is warranted to determine if the low salmon fry abundance is due to issues of channel suitability, habitat access or anthropogenic impacts.

Cito		Chroom	D:ffle	Salmon		Colmon
Site	Grid Ref.	Stream	Rine	Fry	Site Status	Saimon
Number		Order	Grade	Captured		Fry/5min
001	W 53284 57416	6	3	0	Include	0.00
002	W 52596 57541	6	3	5	Include	5.00
003	W 51091 56370	6	2	6	Include	6.00
004	W 50326 55576	6	2	0	Include	0.00
005	W 49321 55085	6	1	2	Include	2.00
006	W 45833 54727	6	1	3	Include	3.00
007	W 44212 54635	6	1	10	Include	12.00
008	W 24166 52973	5	1	29	Include	38.00
009	W 23105 52608	5	2	7	Include	7.00
010	W 24510 51628	6	2	10	Include	10.67
011	W 24563 51601	6	1	11	Include	14.67
012	W 25697 51289	6	1	26	Include	34.97
013	W 27968 51943	6	1	13	Include	17.00
015	W 29151 52173	6	1	14	Include	22.00
016	W 31937 53428	6	1	31	Include	38.00
017	W 31537 52929	6	1	23	Include	31.00
018	W 29967 52703	6	1	32	Include	43.64
019	W 34387 53901	6	1	4	Include	6.00
020	W 33577 53940	6	1	15	Include	18.75
021	W 35770 53988	6	1	21	Include	24.00
022	W 36956 54105	6	1	16	Include	21.00
023	W 38067 54065	6	1	28	Include	38.00
024	W 40489 54264	6	1	11	Include	15.00
025	W 42198 54163	6	1	6	Include	8.00
028	W 20074 49224	3	2	2	Include	2.57
029	W 23133 52164	3	2	5	Include	5.00
031	W 21414 50191	3	2	3	Include	3.00
035	W 18790 50872	4	2	12	Include	13.64
036	W 21353 52105	4	3	1	Include	1.00
037	W 22199 52417	3	2	12	Include	13.64
038	W 22281 52736	3	2	5	Include	7.00
039	W 26681 51327	4	1	20	Include	24.00
040	W 18934 55864	3	2	17	Include	17.81
041	W 18792 56752	3	1	35	Include	40.00
042	W 26161 50003	3	2	7	Include	8.75
044	W 28777 51262	3	3	8	Include	9.00
047	W 24765 47203	3	3	0	Include	0.00
048	W 25803 48524	3	2	13	Include	16.06
049	W 26323 49795	3	2	5	Include	7.00
050	W 16649 55165	3	3	15	Include	18.00
051	W 16476 56047	2	3	2	Include	2.57
052	W 15791 54092	3	0	/	Include	9.63
053	W 1/921 56198	3	3	5	Include	0.07
054	W 19088 56884	3	2	9	Include	9.00
055	W 20272 56745	4	2	8	Include	8.57
056	W 22/54 56525	4	2 1	15	Include	19.//
057	VV 24204 330/9	5 7	т 2	3U A	Include	30.03 E 00
058	VV 40131 59452	2	3 7	4	Include	5.00
059	M 46260 60200	2	2	1 2	Include	1.UU 2.10
060	VV 40309 00308 \N/ 48948 59037	2	2	<u>∠</u> л	Include	2.18 5 <i>6</i> 0
062	W 40340 33027	2	5 1	4	Include	2.00
063	W 50902 62454	5 7	1 1	2	Include	5.25 0.00
067	W 47250 52518	2	1	3	Include	3.46
			-			5.10

Table A.4.2.3: Site specific results of CWEF on the Bandon catchment in 2016.

Site	Grid Ref.	Stream	Riffle	Salmon Fry	Site Status	Salmon Env/5min
Number		order	Grade	Captured		Try/ Shim
068	W 47682 53604	3	2	7	Include	8.24
069	W 48917 54550	3	2	0	Include	0.00
070	W 43543 53342	3	2	0	Include	0.00
071	W 42867 53037	3	2	0	Include	0.00
074	W 23028 59409	3	1	3	Include	4.20
075	W 19081 57227	3	1	19	Include	19.00
077	W 14862 57702	3	0	13	Include	16.71
078	W 35032 55470	3	2	7	Include	11.45
080	W 38024 56025	3	1	8	Include	12.44
081	W 37922 54981	3	0	2	Include	2.00
082	W 37880 54904	3	0	0	Include	0.00
083	W 35257 52419	2	2	0	Include	0.00
084	W 29353 59419	3	2	0	Include	0.00
085	W 29505 58090	3	1	17	Include	17.00
086	W 29104 56321	3	1	14	Include	14.00
087	W 29735 55107	4	0	18	Include	22.91
088	W 24072 58900	2	0	0	Include	0.00
089	W 24005 58899	4	0	21	Include	30.55
090	W 24416 57575	4	0	19	Include	27.00
091	W 40610 58722	2	3	0	Include	0.00
092	W 41412 58078	2	1	0	Include	0.00
095	W 51380 62300	3	1	3	Include	3.86
096	W 51565 59120	3	2	0	Include	0.00
097	W 53125 57384	4	1	0	Include	0.00
030	W 22472 51494	3	2	2	Efficiency below 60%	
076	W 17522 57405	3	1	6	Efficiency below 60%	
094	W 46334 57751	2	2	2	Efficiency below 60%	
027	W 18296 48132	2	2	0	Above Lake	
045	W 22368 46721	3	3	0	Above Lake	
046	W 20904 46994	2	3	0	Above Lake	
014	W 29215 52125	6	1	12	Fished better site 20m us	
066	W 46831 51646		1	0	Habitat unsuitable	
032	W 18303 50589	3	3	0	Probably above salmon	
033	W 18063 51097	3	3	0	Probably above salmon	
034	W 17438 51043	3	2	0	Probably above salmon	
043	W 29356 47586	2	3	0	Probably above salmon	
064	W 51204 53960	3	1	0	Possible Ds Barrier	
065	W 51159 54628	3	1	0	Possible Ds Barrier	





A.4.3.River Croanshagh

IFI Salmon Catchment #:
2016 survey date:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: Tony Holmes Christine Meehan 84 27/7/16 23.38 fry/5min. 23.38 fry/5min.

Fish Species Present:

Brown Trout European Eel Lamprey Minnow Roach Salmon Stoneloach 3-Spined Stickleback





Table A.4.3.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.4.3.2: Conservation limits and provisional returns on the Croanshagh catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon =/ =	Mean Salmon Erv/ Smin
2016	11			2		4.19	2007	2008	301	-190	Open		
							2008	2009	301	-91	Open		
							2009	2010	301	-142	Open		
							2010	2011	301	75	Open		
							2011	2012	301	98	Open		
							2012	2013	301	75	Open		
							2013	2014	274	124	Open		
							2014	2015	274	102	Open		
							2015	2016	274	67	Brown Tag	23 38	23 38

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

This first CWEF survey of this catchment in the 2007 to 2016 period, was carried out during on July 27th 2016. The survey comprised 13 sites, 11 of which were included in the analysis. Salmon fry were present at 10 sites. The maximum fry catch was 39 salmon at site 9. The mean catch of included sites was 23.38 salmon fry/5min. The modal length category of 0+ fry caught was 4.5cm.

In high abundance values were recorded at many sites in this system and the Croanshagh had a mean catch of 23.38 salmon fry/5min in 2016 which is above the 17 salmon fry threshold.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	V 75385 52292	2	2	0	Include	0.00
004	V 75921 52257	3	1	26	Include	30.48
005	V 76174 52553	3	1	31	Include	36.00
006	V 76966 53139	3	1	14	Include	17.73
007	V 77351 53634	3	1	27	Include	27.87
008	V 77834 53776	3	1	7	Include	9.63
009	V 77086 56209	3	1	39	Include	53.27
010	V 76768 56604	3	1	26	Include	34.67
011	V 75230 55054	2	2	4	Include	4.00
012	V 75484 55337	3	2	16	Include	16.00
013	V 75623 55546	3	1	24	Include	27.56
002	V 75591 51789	3	1	0	Above Barrier	
003	V 75693 51944	3	1	0	Above barrier	

Table A.4.3.3: Site specific results of CWEF on the Croanshagh catchment in 2016.

Map A.4.3.1: Showing locations of 2016 survey sites on the Croanshagh River



A.4.4. River Behy

IFI Salmon Catchment #:	
2016 survey dates:	
Mean Salmon Fry/5 min (2016):	
CWEF Index:	

Sampling carried out by: Tony Holmes Christine Meehan

Figure A.4.4.1: Length distribution of salmon captured in 2016 CWEF survey on the Behy Catchment.



Figure A.4.4.2: Comparison of mean salmon fry/5min for all



Table A.4.4.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.4.4.2: Conservation limits and provisional returns on the Behy catchment along with the 2016 CWEF fishing result.

							-						
Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon	Mean Salmon
2007	8					3.53	2007	2008	141	-25	C&R	6.14	
2008	9	1				2.82	2008	2009	141	-25	C&R	4.03	
2009	9	1				2.82	2009	2010	141	-38	C&R	8.71	
2010	8	1				3.13	2010	2011	141	-39	C&R	7.17	
2011	10					2.82	2011	2012	141	-38	C&R		
2016	11					2.56	2012	2013	141	-28	C&R		
							2013	2014	176	-80	C&R		
							2014	2015	176	-83	Closed		
							2015	2016	176	-97	Closed	2.89	5.70

103 26/7/16 2.89 fry/5min. 5.79 fry/5min.

Fish Species Present:

Brown Trout

European Eel Salmon

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

This survey, the sixth of this catchment in the 2007 to 2016 period, was carried out on July 26th 2016. The survey comprised 11 sites, all of which were included in the analysis. Salmon fry were present at just 5 sites. The maximum fry catch was 10 salmon at site 1. The mean catch of included sites was 9.11 salmon fry/5min. The modal length category of 0+ fry caught was 5.5cm; the proportion of larger fry present was high. Water levels during the survey were relatively high which may been instrumental in reducing fry catch efficiency.

The Behy had a mean catch of 9.11 sal fry/5min in 2016. Taking the five most recent surveys into account there is a cumulative average of 5.70 salmon fry/5min which is below the 17 salmon fry threshold. There has been a significant reduction in the salmon fry CWEF in 2016 compared to previous years.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	V 64467 87888	4	2	10	Include	12.11
002	V 63965 86992	3	3	1	Include	1.00
003	V 63961 85686	3	2	7	Include	9.33
004	V 64021 87805	3	1	8	Include	8.00
005	V 63076 87560	3	5	0	Include	0.00
006	V 62173 86997	3	3	0	Include	0.00
007	V 64795 86815	2	2	0	Include	0.00
008	V 63533 85000	2	2	0	Include	0.00
009	V 66399 91069	4	2	0	Include	0.00
010	V 65093 89273	4	2	1	Include	1.38
011	V 61932 86938	2	2	0	Include	0.00

Table A.4.4.3: Site specific results of CWEF on the Behy catchment in 2016.

Map A.4.4.1: Showing locations of 2016 survey sites on the Behy River



A.4.5. River Emlagh

IFI Salmon Catchment #: 2016 survey dates: Mean Salmon Fry/5 min (2016): CWEF Index:

Sampling carried out by: Tony Holmes Christine Meehan

Figure A.4.5.1: Length distribution of salmon captured in 2016 CWEF survey on the Emlagh Catchment.



Table A.4.5.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

	Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
Ì	2007	4					5.02
	2008	5					4.02
	2009	5					4.02
	2010	5					4.02
	2011	5					4.02
_	2016	5					4.02

108 25/8/16 – 25/8/16 2.10 fry/5min. 5.47 fry/5min.

Fish Species Present:

Brown Trout European Eel Salmon

Figure A.4.5.2: Comparison of mean salmon fry/5min for all surveys on the Emlagh catchment to 2016.



Table A.4.5.2: Conservation limits and provisional returns on the Emlagh catchment along with the 2016 CWEF fishing result.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon	Mean Salmon Frv/ Smin
2007	2008	129	-51	Closed	3.66	
2008	2009	129	-51	Closed	13.38	
2009	2010	129	-58	Closed	3.84	
2010	2011	129	-58	Closed	2.59	
2011	2012	129	-58	Closed		
2012	2013	129	-58	Closed		
2013	2014	136	-74	Closed		
2014	2015	136	-75	Closed		
2015	2016	136	-75	Closed	2.10	5.47

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

This survey, the sixth of this catchment in the 2007 to 2016 period, was carried out on the 25th July 2016. The survey comprised 5 sites, all of which were included in the analysis. Salmon fry were present at 4 sites. The maximum fry catch was 61 salmon at site 9. The mean catch of included sites was 2.10 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

The Emlagh had a mean catch of 2.10 sal fry/5min in 2016. Taking the five most recent surveys into account there is a cumulative average of 5.7 salmon fry/5min which is below the 17 salmon fry threshold. There has been a significant reduction in the salmon fry CWEF in 2016 compared to previous years.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	Q 64986 02419	4	1	3	Include	3.80
002	Q 64801 03268	4	0	1	Include	1.00
003	Q 65169 04117	4	1	4	Include	4.47
004	Q 66300 05079	4	1	1	Include	1.21
005	Q 66725 05598	4	0	0	Include	0.00

Table A.4.5.3: Site specific results of CWEF on the Emlagh catchment in 2016.

Map A.4.5.1: Showing locations of 2016 survey sites on the Emlagh River



A.4.6.River Scorid

IFI Salmon Catchment #: 2016 survey dates: Mean Salmon Fry/5 min (2016):

Sampling carried out by: Tony Holmes Christine Meehan 115 22/7/16 1.86 fry/5min.

Fish Species Present: Brown Trout European Eel

Flounder Salmon

Figure A.4.6.1: Length distribution of salmon captured in 2016 CWEF survey on the Scorid River.



This survey, the first of the Scorid system was carried out on the 27th of July 2016. The survey consisted of 5 sites, 4 of which were included in the analysis. Salmon fry were present at 5 sites. The maximum fry catch was 7 salmon at site 7. The mean catch of included sites was 1.86 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm.

Conclusion

The Scorid is not defined as 'a significant producer of salmon' and the SSC does not provide scientific advice on salmon stock levels. This 2016 survey established the salmon spawn in certain areas of the river below Loch an Duin.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
011	Q 52715 07762	2	3	0	Include	0.00
012	Q 52677 08419	3	2	5	Include	6.43
014	Q 53300 10191	3	1	0	Include	0.00
015	Q 53563 11108	3	2	1	Include	1.00
013	Q 53008 09830	3	3	0	water too fast	

Table A.4.6.1: Site specific results of CWEF on the Scorid catchment in 2016.



Map A.4.6.1: Showing locations of 2016 survey sites on the Scorid (left) and Glenahoo Rivers (right).

A.4.7.River Glenahoo

IFI Salmon Catchment #: 2016 survey dates: Mean Salmon Fry/5 min (2016):

Sampling carried out by: Tony Holmes Christine Meehan 115 27/7/16 1.86 fry/5min.

Fish Species Present: Brown Trout European Eel

Flounder Salmon

Figure A.4.7.1: Length distribution of salmon captured in 2016 CWEF survey on the Glenahoo Catchment.



This survey, the first one of the Glenahoo was carried out on the 27th of July 2016. The survey consisted of ten sites, all of which were included in the analysis. Salmon fry were present at 5 sites. The maximum fry catch was 7 salmon at site 7. The mean catch of included sites was 1.86 salmon fry/5min. The modal length category of 0+ fry caught was 5.5cm.

Conclusion

The Glenahoo is not defined as 'a significant producer of salmon' and the SSC does not

provide scientific advice on salmon stock levels. This 2016 survey established that salmon spawn certain areas of the river primarily in its middle reaches (Map A.5.11.1.) which has some excellent gravels and pools which would appear to offer ideal spawning and nursery habitat.

Table A.4.7.1: Site specific results of CWEF on the Glenahoo catchment in 201

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
001	Q 55628 07416	2	3	0	Include	0.00
002	Q 55623 07312	3	3	0	Include	0.00
003	Q 55287 07593	3	2	0	Include	0.00
004	Q 55142 07726	3	1	1	Include	1.00
005	Q 55004 08119	3	1	5	Include	6.03
006	Q 54767 08652	3	1	1	Include	1.30
007	Q 54725 09068	3	1	7	Include	8.31
008	Q 54552 09562	3	3	2	Include	2.00
009	Q 53846 10914	3	3	0	Include	0.00
010	Q 53816 11291	3	3	0	Include	0.00

A.4.8. Rivers Owenamallagh and Meennascarty and Owencashla/Aughacasla

14/7/16 0 fry/5min (Owenamallagh) 4.89 fry/5min (Owencashla) 0 fry/5min (Meennascarty)				
Fish Species Present: Brown Trout Salmon	European Eel			
	14/7/16 0 fry/5min (Owenamall 4.89 fry/5min (Owenca 0 fry/5min (Meennasca Fish Species Present: Brown Trout Salmon			

These small catchments are situated on the north side of the Dingle peninsular near Castlegregory. All are short systems, originating in high upland areas and flowing northwards to Tralee bay. None are defined as 'significant producers of salmon'.

This exploratory CWEF survey of these three catchments was carried out on July 14th 2016.





The survey comprised two sites on the Owenamallagh, four on the Meennascarty and seven on the Owencashla. All sites were included in the analyses. Salmon fry were only present on the Owencashla. The Owenamallagh is extremely small and only holds a few trout. The Meenascarty is a more extensive catchment and has some good habitat and holds reasonable numbers of trout.

On the Owencashla salmon are likely to be able to access Lough Slat and spawn immediately below the lough and in the lower section of the Drishoge river, upstream of the lake. Both areas

have good salmon spawning habitat. Downstream of the lake substrate is quite small, depth is variable and several pools occur. Further downstream the substrate becomes very large and is less suitable for salmon spawning.

Conclusion

Surveys on the Owenamallagh and Meennascarty recorded trout; no juvenile salmon were observed. The Meennascarty has a small population of trout. Salmon were found to utilize the Owencashla and were generally confined to the upper reaches. Spawning activity is likely to be associated with proximity of spawning areas to the lake which allows adult fish to remain until spawning time.

Site Number	Catchment	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Trout Fry Captured	Site Status	Salmon Fry/5min
001	Owenamallagh	Q 62949 10836	2	3	0	2	Include	0.00
002	Owenamallagh	Q 64069 12033	2	3	0	4	Include	0.00
001	Aghacashla	Q 61222 08124	3	2	12	4	Include	15.75
002	Aghacashla	Q 62014 08446	4	2	9	2	Include	12.27
003	Aghacashla	Q 62057 08299	3	1	3	5	Include	4.88
004	Aghacashla	Q 62716 08905	4	2	0	8	Include	0.00
005	Aghacashla	Q 63190 09084	4	1	0	2	Include	0.00
006	Aghacashla	Q 64555 10319	4	3	1	5	Include	1.33
007	Aghacashla	Q 65067 11411	4	3	0	1	Include	0.00
001	Meenascarty	Q 64649 07721	3	1	0	17	Include	0.00
002	Meenascarty	Q 64918 08374	3	1	0	5	Include	0.00
003	Meenascarty	Q 65283 09371	3	1	0	15	Include	0.00
004	Meenascarty	Q 66246 09942	3	1	0	4	Include	0.00

Table A.4.8.1: Site specific results of CWEF on the Aghacashla Owenamallagh and Meenascarty catchments in 2016.

Map A.4.8.1: Showing locations of 2016 survey sites on the Owenamallagh, Meenascarty and Owencashla Rivers







A.5.Shannon River Basin District

Summary

Since 2007, fifteen rivers have been surveyed in the Shannon River Basin District as part of the ongoing catchment-wide electrofishing surveys. These are presented in Table A.5.1. The Deel, Doonbeg and Skivaleen were surveyed in this district in 2016 due to high water levels it was not possible to complete any of these surveys. Despite this, some results were generated and these suggest that fish abundances were generally similar to those found during previous surveys.

Table A.5.1: Catchment-wide Electrofishing data for the Shannon River Basin District 2007-2016 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

					Surve	v Year						# Annual
					04.10	., .cu.					Current	Surveys
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Index	Considered
118/Brick	0.00										0.00	1
119/Feale							24.15				<u>24.15</u>	1
120/Galey			12.99								12.99	1
125/Deel					0.14			0.18		1.87*	0.16	2
126/Maigue			2.82	16.05			12.05				10.31	3
128/Shannon Kilcrow				0.69							0.69	1
128/Shannon Graney				0.19							0.19	1
128/Shannon Woodford				0.00							0.00	1
130/Owenagarney (Ratty)							16.97	9.97			13.47	2
131/Fergus	12.96		4.10	6.84			5.89		6.66		7.29	5
133/Doonbeg				12.28				17.39		16.14*	14.83	2
134/Skivaleen					14.82				11.68	14.54*	13.25	2
135/Annageeragh							1.82	9.24			5.53	2
142/Inagh								5.31	3.59		4.45	2
143/Aughyvackeen					1.00						1.00	1

Bold annual figures indicate years included in calculation of current CWEF index.

<u>**Underlined**</u> index figures indicate those exceeding the 17 salfry threshold.

* Incomplete surveys not included in calculation of current index.

A.5.1.River Deel

IFI Salmon Catchment #: 2016 survey dates: Mean Salmon Fry/5 min (2016): CWEF Index:	125 6/9/16 - 15/9/16 Survey incomplete. 0.16 fry/5min.	
Sampling carried out by:	Fish Species Present:	
Catherine Hayes	Brown Trout	Salmon
David Germaine	Crayfish	Stoneloach
Marcus McMahon Ray Byrne	European Eel Minnow	3-Spined Stickleback

Figure A.5.1.1: Length distribution of salmon captured in 2016 CWEF survey on the Deel Catchment.



Table A.5.1.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2011	40				59	2.54
2014	32				71	2.44
2016	23				1	10.47

Previous CWEF surveys of the catchment have identified sites suitable for surveying. In 2011 CWEF surveys were undertaken at 40 sites, and in 2014 a total of 32 sites were surveyed. This year, due to high water levels only 23 sites were completed. Despite the survey not being complete the sites that were surveyed were well distributed throughout the catchment (maps A.5.4.1). Results show that most of the catchment is not producing salmon, but in contrast to previous surveys juvenile salmon were present in the Dooally and Arra Rivers around Newcastle west.

Conclusion

Throughout most of the Deel catchment salmon fry are absent or numbers are very low, some fry were found in the Arra and Dooally rivers suggesting that some spawning occurred in 2015/2016.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured		Site Status	Salmon Fry/5min
011	R 30746 35153	6	1	0	Include		0.00
014	R 31289 31399	5	3	0	Include		0.00
022	R 41578 21353	4	1	0	Include		0.00
032	R 40981 18276	3	1	0	Include		0.00
036	R 37898 21114	2	1	0	Include		0.00
048	R 33162 21778	3	1	0	Include		0.00
051	R 30953 21693	3	1	0	Include		0.00
052	R 30046 21490	2	1	0	Include		0.00
053	R 30629 24024	3	1	0	Include		0.00
056	R 28179 25269	3	1	0	Include		0.00

Table A.5.1.2: Site specific results of CWEF on the Deel catchment in 2016.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured		Site Status	Salmon Fry/5min
063	R 36498 32304	2	2	0	Include		0.00
067	R 38547 33562	2	1	0	Include		0.00
073	R 28658 33496	5	2	7	Include		8.40
074	R 26954 33516	3	1	1	Include		1.20
075	R 27256 33683	3	1	20	Include		22.22
080	R 29408 34067	3	1	0	Include		0.00
082	R 27579 35906	3	2	0	Include		0.00
083	R 26174 37711	3	2	0	Include		0.00
085	R 27004 34681	3	1	9	Include		11.25
094	R 30694 38997	3	1	0	Include		0.00
095	R 28746 39476	3	1	0	Include		0.00
097	R 32495 42904	2	1	0	Include		0.00
100	R 33440 30491	3	1	0	Include		0.00
076	R 25019 33814	2	0	0	not Fished		

Map A.5.1.1: Showing locations of 2016 survey sites on the Deel River



A.5.2.River Doonbeg

IFI Salmon Catchment #: 2016 survey dates: Mean Salmon Fry/5 min (2016): CWEF Index:

Sampling carried out by: Catherine Hayes David Germaine Tom Hilger

Figure A.5.2.1: Length distribution of salmon captured in 2016 CWEF survey on the Doonbeg Catchment.



133 16/8/16-17/8/16 Survey not complete 14.83 fry/5min.

Fish Species Present:

Brown Trout European Eel Salmon



Table A.5.2.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2010	15		4	8		2.56
2014	15	1			5	3.29
2016	11		1			5.76

Table A.5.2.2: Conservation limits and provisional returns on the Doonbeg catchment along with the 2016 CWEF fishing result.

Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
2007	2008	425	-202	Closed		
2008	2009	425	-201	Closed		
2009	2010	425	-201	Closed	12.28	
2010	2011	425	-201	Closed		
2011	2012	425	-201	Closed		
2012	2013	425	-217	Closed		
2013	2014	523	-354	Closed	17.39	
2014	2015	524	-354	Closed		
2015	2016	524	-354	Closed	16.14*	14.83

C&R = Catch and Release; 1SW = One Sea Winter ; CL= Conservation Limit. * Incomplete survey not included in calculation of mean salfry.

Previous CWEF surveys of the catchment have identified sites suitable for surveying; in 2010 and 2014 surveys 15 sites were included in the calculation of the annual CWEF average. This year, due to high water levels only 11 sites were completed; ten of these sites had been surveyed in 2014, 8 in 2010. 2016 results were generally consistent with those seen in 2014.

Figure A.5.2.2: Comparison of mean salmon fry/5min for all surveys on the Doonbeg catchment to 2016.

Though no CWEF average has been produced this year the Doonbeg results this year are broadly in agreement with results achieved in 2014.

Site	Grid Ref	Stream	Riffle	Salmon	Site Status	Salmon Fry/5min				
Number	Ghù hei.	Order	Grade	Captured	Site Status	2010	2014	2016		
009	R 06535 63351	2	2	9	Include	3	6.75	11.57		
011	R 07917 60734	2	1	13	Include	10.91	18	17.06		
013	R 09069 61692	2	1	27	Include	18.94	23.61	31.35		
017	R 11732 61955	2	1	6	Include		21.1	6.92		
018	R 15098 62120	2	1	9	Include	5	27.42	10.50		
020	R 14712 63797	3	1	21	Include	22.32	16.95	24.00		
024	R 16791 65153	2	1	15	Include	12.76	10.75	17.73		
025	R 18099 65591	2	2	1	Include	3.43	1.3	1.21		
027	R 14079 64352	3	1	24	Include	34.69	32.56	30.22		
029	R 14974 65376	3	1	18	Include		27.92	18.00		
031	R 07959 60773	3	0	6	Include			9.00		
014	R 10036 62510	1	2	0	Stream order<2					

Table A.5.2.3: Site specific results of CWEF on the Doonbeg catchment in 2016, also included are the previous results observed at the same sites at previous surveys (sites not fished this year are not included).

Map A.5.2.1: Showing locations of 2016 survey sites on the Doonbeg



A.5.3.River Skivaleen

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: Catherine Hayes David Germaine Tom Hilger

Figure A.5.3.1: Length distribution of salmon captured in 2016 CWEF survey on the Skivaleen Catchment.



Table A.5.3.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2011	5				7	2.49
2015	7				3	2.99
2016	3	1				7.48

134 18/8/16 Survey not complete 13.25 fry/5min.

Fish Species Present:

Brown Trout European Eel Salmon

Figure A.5.3.2: Comparison of mean salmon fry/5min for all surveys on the Skivaleen catchment to 2016.



Table A.5.3.2: Conservation limits and provisional returns on the Skivaleen catchment along with the 2016 CWEF fishing result.

	Spawning Year	Fry Year	1SM CL	1SW Predicted Surplus	Status	5min Annual Salmon Fry/ 5min	Mean Salmon Fry/
•	2007	2008	372	-180	Closed		
	2008	2009	372	-180	Closed		
	2009	2010	372	-180	Closed		
	2010	2011	372	-180	Closed	14.82	
	2011	2012	372	-180	Closed		
	2012	2013	372	-180	Closed		
	2013	2014	457	-299	Closed		
	2014	2015	457	-299	C & R	11.68	
	2015	2016	457	-297	C & R	14.54*	

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

* Incomplete survey not included in calculation of mean salfry.

Previous CWEF surveys of the catchment have identified sites suitable for surveying; in 2011 and 2015 surveys five and seven sites respectively were included in the calculation of the annual CWEF average. This year, due to high water levels only 4 sites were completed; at one of these the efficiency was below the required 60% and had to be excluded. For that reason, with only three sites, no CWEF average was calculated this year. Salmon were present at each site, numbers were comparable with those found in previous surveys.

Though no CWEF average has been produced this year the Skivaleen results this year are broadly in line with results recorded in 2011 and 2015.

Table A.5.3.3: Site specific results of CWEF on the Skivaleen catchment in 2016, also included are the previous resu	ılts
observed at the same sites at previous surveys (sites not fished this year are not included).	

Site	Crid Def	Stream	Riffle		Salmon Fry/5min	
Number	Gha kei.	Order	Grade	2011	2015	2016
010	R 12335 66591	2	2	0	12.38	9.33
011	R 09627 67374	2	1	0		13.57
012	R 05305 67361	2	1	7.78	9.45	20.71
008	R 08778 66810	3	2	28.3	21.62	

Map A.5.3.1: Showing locations of 2016 survey sites on the Skivaleen.



A.6.Western River Basin District

Summary

Since 2007, twenty-eight salmon rivers have been surveyed in the Western River Basin District as part of the on-going catchment-wide electrofishing surveys. These are presented in Table A.6.1. The Erriff and Ballinglen were surveyed in this district in 2016. Of those catchments the Erriff has a CWEF index of over 17. The result from the Ballinglen was quite low in comparison with previous surveys.

					Survey	Year					_	# Annual
											Current	Surveys
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Index	Considered
145/Kilcolgan			2.51								2.51	1
146/Clarinbridge					7.26						7.26	1
147/Corrib	15.75										15.75	1
148/Knock					12.53						12.53	1
149/Owenboliska-Spiddal		4.06						4.52			4.29	2
152/Cashla							10.83				10.83	1
154/L. Na Furnace stream									0.00		0.00	1
163/Owenglin			11.57								11.57	1
167/Culfin		30.83									<u>30.83</u>	1
168/Erriff	29.51	24.10	16.03	20.43	20.86	24.45	27.45	24.90	28.52	21.72	25.41	5
171/Carrownisky		18.25				20.60	18.22				<u>19.03</u>	3
172/Bunowen			13.62								13.62	1
173/Owenwee (Belclare)				8.47	7.25	15.27					10.33	3
178/Newport (L. Beltra)	16.06		5.53					17.36			12.99	3
179/Srahmore			4.33								4.33	1
181/Owengarve			5.51					6.19	0.72		4.14	3
185/Owenduff (Bangor)			6.00					6.20			6.10	2
186/Owenmore - MC							27.65				27.65	1
186/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		0.00		0.71	22.27	17.00	15.00				14.05	F
(Palmerstown)		8.96		9.71	22.27	17.32	15.02				14.65	5
196/Brusna			4.70				14.16	14.74			11.20	3
198/Leaffony	5.76		7.95						1.87		5.20	3
203/Garvogue (Bonnet)	18.41	13.26	16.83	11.31	7.08	18.54					13.41	5
205/Drumcliff				17.72							<u>17.72</u>	1
207/Grange	5.75		3.29						4.56		4.53	3

Table A.6.1: Catchment-wide Electrofishing data for the Western River Basin District 2007-2016 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

Bold annual figures indicate years included in calculation of current CWEF index.

<u>Underlined</u> index figures indicate those exceeding the 17 salfry threshold.





A.6.1.River Erriff

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: Barry Kelly Donvan Brinklow John Kilcoyne Laura Walsh Paddy Gargan 168 19/9/16-30/9/16 21.72 fry/5min. 25.41 fry/5min.

Fish Species Present:

Brown Trout European Eel Minnow Salmon 3-spined Stickleback.

35

30

25

20

15

10

5

0

2007

Average Salfry/5min

29.51

24.10

²⁰08 ²⁰09

6.03



Table A.6.1.1: Details of numbers of sites included in and

excluded from the CWEF analysis along with site density

achieved each year.

Figure A.6.1.1: Length distribution of salmon captured in 2016 CWEF survey on the Erriff Catchment.

Table A.6.1.2: Conservation limits and provisional returns on the Erriff catchment along with the 2016 CWEF fishing result.

2011 2012

Survey Year

2010

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
2010	46	2	2	1		2.78	2008	2009	1299	2345	Open	16.03	
2011	32		1	1	1	4.05	2009	2010	1299	715	Open	20.43	
2012	33		1	1		4.05	2010	2011	1299	512	Open	20.86	
2013	33		1			4.17	2011	2012	1299	605	Open	24.45	
2014	34		1			4.05	2012	2013	1299	592	Open	27.45	
2015	35		1	1		3.83	2013	2014	1382	520	Open	24.90	
2016	32	1				4.30	2014	2015	1382	669	Open	28.52	
							2015	2016	1382	806	Open	21.72	25.41

1SW = One Sea Winter ; CL= Conservation Limit.

This survey, the eighth of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. The survey comprised 33 sites, 31 of which were included in the analysis. Salmon fry were present at all sites. The maximum fry catch was 43 salmon at sites 19 and 55. The mean catch of included sites was 21.72 salmon fry/5min. The modal length category of 0+ fry caught was 5.5cm.

Figure A.6.1.2: Comparison of mean salmon fry/5min for all surveys on the Erriff catchment to 2016.

20.43 20.86 27.45

2013

2014 2015 2016

24.45

24.90

28.52

21.72

The Erriff had a mean catch of 21.72 sal fry/5min in 2016. Salmon fry are widely distributed in the catchment. Taking the five most recent surveys into account there is a cumulative average of 25.41 salmon fry/5min which is above the 17 salmon fry threshold.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
002	L 92702 65721	5	0	20	Include	22
003	L 93503 66122	5	0	24	Include	29
005	L 94352 66589	5	0	23	Include	27
006	L 94798 67019	5	0	17	Include	22
007	L 95142 67641	5	0	17	Include	21
008	L 95846 67875	5	0	22	Include	25
010	L 97630 71190	4	1	13	Include	15
011	L 97125 71269	4	1	25	Include	30
012	L 96732 71295	4	1	15	Include	21
013	L 95919 71252	4	1	27	Include	34
014	L 95163 71013	4	1	2	Include	3
019	L 92739 73748	4	1	43	Include	51
020	L 92438 73774	4	1	23	Include	25.88
021	L 92057 73962	4	2	17	Include	21
024	L 90454 74809	3	2	31	Include	36
026	L 90525 64492	3	2	4	Include	4
028	L 93462 65558	4	0	8	Include	9
029	L 95076 67299	3	0	6	Include	7
030	L 94855 67725	3	0	15	Include	19
031	L 90058 67605	3	0	30	Include	33.64
032	L 89506 67128	2	0	7	Include	8
033	L 96407 69493	3	0	9	Include	10
034	L 99926 72098	4	1	27	Include	29
035	M 00301 72204	4	1	24	Include	30
036	M 00529 72263	4	3	10	Include	12
037	M 00973 73488	3	2	14	Include	17.5
039	M 01401 73456	3	2	5	Include	7
040	M 01753 73717	3	1	14	Include	18
041	M 02046 73578	2	1	3	Include	3
055	L 89035 74550	3	2	43	Include	47
056	L 96034 68324	5	0	32	Include	35
057	L 89337 66953	2	0	10	Include	11.43
025	L 89216 74612	3	2	6	Efficiency below 60%	

Table A.6.1.3: Site specific results of CWEF on the Erriff catchment in 2016.





A.6.2. River Ballinglen

IFI Salmon Catchment #: 2016 survey dates: Mean Salmon Fry/5 min (2016): **CWEF Index:**

Sampling carried out by: Brian Flannerry John-Luke Flanagan

193 30/8/16-1/9/16 4.97 fry/5min. 9.27 fry/5min.

Fish Species Present:

Brown Trout European Eel Salmon 3-spined Stickleback.

Figure A.6.2.1: Length distribution of salmon captured in 2016 CWEF survey on the Ballinglen Catchment.



Figure A.6.2.2: Comparison of mean salmon fry/5min for all surveys on the Ballinglen catchment to 2016.



Table A.6.2.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.6.2.2: Conservation limits and provisional returns on the Ballinglen catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
2007	6					6.54	2006	2007			Closed	10.65	
2011	12		1		1	2.80	2008	2009	395	-246	Closed		
2013	10	1				3.57	2009	2010	395	-246	Closed		
2016	18					3.27	2010	2011	395	-246	Closed	15.09	
							2011	2012	395	-246	Closed		
							2012	2013	395	-246	Closed	6.37	
							2013	2014	408	-312	Closed		
							2014	2015	410	-313	Closed		
							2015	2016	410	-313	Closed	4.97	9.27

1SW = One Sea Winter ; CL= Conservation Limit.

This survey, the fourth of this catchment in the 2007 to 2016 period, was carried out during august and Sept 2016. The survey comprised 12 sites, all of which were included in the analysis. Salmon fry were present at 9 sites. The maximum fry catch was 9 salmon at site 8. The mean catch of included sites was 4.97 salmon fry/5min. The modal length category of 0+ fry caught was 6.5cm. This result the lowest recorded on this catchment and much lower that the best year 2011 which had an average of 15.09 salmon fry per 5min.



Map A.6.2.1: Showing locations of 2016 survey sites on the Ballinglen.

Conclusion

The Ballinglen had a mean catch of 4.97 salfry/5min in 2016. Taking the four surveys into account there is a cumulative average of 9.27 salmon fry/5min which is below the 17 salmon fry threshold.

Table A.6.2.3: Site specific results of CWEF on the Ballinglen catchment in 2016.

Site Number	Grid Ref.	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
002	G 10486 31880	3	2	6	Include	6
003	G 10119 38066	4	2	2	Include	2
004	G 10319 33557	3	1	0	Include	0
005	G 10378 36972	4	2	4	Include	5.71
007	G 10335 36044	4	2	1	Include	1.5
008	G 10254 34688	4	2	9	Include	11.7
010	G 09927 30824	3	0	0	Include	0
012	G 10219 34145	4	2	7	Include	8.56
013	G 08875 32955	3	3	5	Include	6.11
014	G 10333 33510	3	2	6	Include	8
017	G 10409 32761	2	2	8	Include	10
018	G 10409 32761	2	2	0	Include	0

A.7. North Western River Basin District

Summary

Since 2007, thirty-one salmon rivers have been surveyed in the North Western River Basin District as part of the on-going catchment-wide electrofishing surveys. These are presented in Table A.7.1. Of those catchments the Eany, Oily, Bungosteen, Glen, Clady, Lackagh and Leannan currently have an index of over 17. Persistently high water levels prevented the completion of all surveys attempted in 2016.

Table A.7.1: Catchment-wide Electrofishing data for the North Western River Basin District 2007-2016 showing the average salmon fry captured /5min for each year surveyed. Also shown is the Surveys Mean capture rate.

					Survey	Year						# Annual
·					Survey	rear					Current	Surveys
Code/River	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Index	Considered
208/Duff	7.84	9.31	18.59	25.16							15.23	4
210/Erne		7.37*	0.17*	0.08*	0.00*	0.00*	0.00*	1.60*	1.16*	1.25*		
211/Abbey							7.20	28.14			17.67	2
212/Ballintra			10.27				13.40	18.07			13.91	3
213/Laghy			8.58				14.97	11.02			11.52	3
214/Eske		13.10	16.99	16.30					13.45		14.96	4
215/Eany				15.86		30.08			12.89		<u>19.61</u>	3
216/Oily			9.49		33.68			16.62			<u>19.93</u>	3
217/Bungosteen					25.12		17.09				<u>21.11</u>	2
219/Glen (Ballyshannon)				19.44					18.37		<u>18.91</u>	2
220/Owenwee (Yellow R)	21.45	5.00	14.81			20.31	19.65				16.24	5
221/Bracky		10.82				21.57		12.24			14.88	3
222/Owentocker		20.06									20.06	1
226/Owenamarve			3.76				2.64	1.00			2.47	3
228/Gweedore (Crolly R.)		15.99			11.32						13.65	2
229/Clady		16.12				37.21					26.67	2
234/Glenna			16.80		3.77		7.77			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	3
240/Lackagh		18.86	15.82		19.20	23.57				17.67*	<u>19.36</u>	4
248/Leannan	9.47	7.41	8.73	16.71	12.36	21.51	19.51	20.87	15.27	14.90*	17.90	5
249/Swilly		9.33	7.36				18.08	8.05			10.71	4
250/Isle (Burn)						2.12					2.12	1
251/Burnfoot		7.77		2.90							5.33	2
252/Mill (Letterkenny)				0.00					0.00		0.00	2
253/Crana			15.74							6.00*	15.74	1
256/Clonmany		16.61		6.59					4.21		9.14	3
257/Straid				0.20					0.00		0.10	2
258/Donagh				4.25					0.68		2.46	2
259/Glennagannon			16.65		4.05		7.13				9.28	3
261/Culoort				4.03					0.00		2.02	2

Bold annual figures indicate years included in calculation of current CWEF index.

<u>Underlined</u> index figures indicate those exceeding the 17 salfry threshold. * Incomplete surveys not included in calculation of current index.





A.7.1.River Erne

IFI Salmon Catchment #:	210					
2016 survey dates:	13/7/16-25/8/16					
Mean Salmon Fry/5 min (2016):	1.25 fry/5min.					
CWEF Index:	Not Calculated.					
Sampling carried out by:	Fish Species Present	:				
Cormac Goulding	Brown Trout	Perch				
Frank Greene	Crayfish	Roach				
Kevan Murphy	European Eel	Salmon				
Val Fitzpatrick	Lamprey sp.	Stone Loach				
	Minnow	Three-spined Stickleback				

Figure A.7.1.1: Length distribution of salmon captured in 2016 CWEF survey on the Erne Catchment.



This survey, the ninth of this catchment in the 2007 to 2016 period, was carried out from July to August 2016. The Erne is an extensive catchment and by necessity surveys are confined to smaller tributaries in the extremities of the catchment.

In 2016 surveys were undertaken on 4 sub-catchments: the Blackwater, Swanlinbar, Aghacashlaun and the Annalee, and comprised a total of 40 sites. Salmon fry were found in just one of the sub-catchments - the Swanlinbar and were present at 6 sites fished on the 28th of July and the 10th of August. The maximum fry catch was 18 salmon at site 12. No salmon fry were found on the Blackwater, Aghacashlaun or the Annalee sub-catchments. The mean catch of included sites overall was 1.16 salmon fry/5min. Two cohorts of juvenile salmon (fry and parr) were captured; the modal length category of 0+ fry caught was 7.5cm.

Conclusion

The Erne had a mean catch of 1.25 sal fry/5min in 2016. The fish captured were most likely of hatchery origin, the stretch of river in question having been stocked with fingerlings in July 2016.

ed in Figure A.7.1.2: Comparison of mean salmon fry/5min for all surveys on the Erne catchment to 2016.

.25

2016
Site #	Grid Ref.	Sub- Catchment	Stream Order	Riffle Grade	Salmon Fry Captured	Site Status	Salmon Fry/5min
047	H 04889 10814	Aghacashlaun	3	1	0	Include	0.00
129	H 04876 10265	Aghacashlaun	3	1	0	Include	0.00
130	H 04926 10428	Aghacashlaun	3	1	0	Include	0.00
131	H 04923 10611	Aghacashlaun	3	1	0	Include	0.00
111	H 51302 13972	Annalee	3	2	0	Include	0.00
117	H 54060 11427	Annalee	5	2	0	Include	0.00
503	H 55660 12946	Annalee	4	1	0	Include	0.00
606	H 51310 06751	Annalee	3	1	0	Include	0.00
607	H 51032 06817	Annalee	3	1	0	Include	0.00
608	H 50552 05513	Annalee	3	0	0	Water Too Fast	
609	H 50714 04588	Annalee	3	2	0	Include	0.00
611	H 51383 05209	Annalee	3	2	0	Include	0.00
612	H 52261 06681	Annalee	3	2	0	Include	0.00
614	H 52928 05164	Annalee	3	2	0	Include	0.00
615	H 52947 03681	Annalee	3	3	0	Include	0.00
616	H 54108 02040	Annalee	3	2	0	Include	0.00
619	H 53328 02930	Annalee	3	2	0	Include	0.00
620	H 55265 01245	Annalee	3	3	0	Include	0.00
621	H 55946 01106	Annalee	2	3	0	Include	0.00
623	H 56838 02238	Annalee	2	3	0	Include	0.00
629	H 52923 11221	Annalee	3	2	0	Include	0.00
639	H 50052 03904	Annalee	2	2	0	Include	0.00
641	H 49079 02187	Annalee	2	3	0	Include	0.00
642	H 54742 01712	Annalee	3	3	0	Include	0.00
608	H 50552 05513	Annalee	3	0	0	Water Too Fast	
056	H 17440 16289	Blackwater	4	1	0	Include	0.00
122	H 17292 16197	Blackwater	4	2	0	Include	0.00
123	H 17191 16177	Blackwater	4	1	0	Include	0.00
124	H 16967 16105	Blackwater	4	2	0	Include	0.00
125	H 16786 16083	Blackwater	4	2	0	Include	0.00
126	H 16558 16140	Blackwater	4	2	0	Include	0.00
127	H 16502 16143	Blackwater	3	2	0	Include	0.00
128	H 16348 16190	Blackwater	3	2	0	Include	0.00
002	H 20414 28394	Swanlinbar	5	1	1	Include	1.00
005	H 19626 27196	Swanlinbar	4	2	9	Include	11.00
006	H 19245 27130	Swanlinbar	4	2	1	Include	1.40
012	H 20405 28185	Swanlinbar	5	1	18	Include	19.50
014	H 19906 27154	Swanlinbar	5	1	9	Include	9.69
022	H 20513 28690	Swanlinbar	5	1	4	Include	6.00
030	H 14308 23708	Swanlinbar	2	2	0	Include	0.00
059	H 14006 21706	Swanlinbar	2	3	0	Include	0.00

Table A.7.1.3: Site specific results of CWEF on the Erne catchment in 2016.





A.7.2. River Glenna

IFI Salmon Catchment #: 2016 survey dates: Mean Salmon Fry/5 min (2016): CWEF Index:	234 1/9/16-6/9/16 4.00 fry/5min. 8.09 fry/5min.
Sampling carried out by:	Fish Species Present:
Owen Kelly	Brown Trout
Cornelius McMullen	European Eel
Paul Burke	Salmon

Figure A.7.2.1: Length distribution of salmon captured in 2016 CWEF survey on the Glenna Catchment.



Figure A.7.2.2: Comparison of mean salmon fry/5min for all surveys on the Glenna catchment to 2016.



Table A.7.2.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.7.2.2: Conservation limits and provisional returns on the Glenna catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	SalFry/ 5min	Mean SalFry/ 5min
2009	6					3.17	2007	2008	207	-86	C&R		
2011	6					3.17	2008	2009	207	-86	C&R	16.80	
2013	6					3.17	2009	2010	207	-86	C&R		
2016	6					3.17	2010	2011	207	-86	C&R	3.77	
							2011	2012	207	-86	C&R		
							2012	2013	207	-86	Closed	7.77	
							2013	2014	215	-123	Closed		
							2014	2015	215	-122	Closed		
							2015	2016	215	.122	Closed	4.00*	

1SW = One Sea Winter ; CL= Conservation Limit.

This survey, the fourth of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. The survey comprised 6 sites, all of which were included in the analysis. Salmon fry were present at four sites. Salmon are confined to the middle and lower reaches based on these data. The maximum fry catch was 9 salmon at site 2. The mean catch of included sites was 4 salmon fry/5min.



Map A.7.2.1: Showing locations of 2016 survey sites on the Glenna.

Conclusion

The Glenna had a mean catch of 6 salfry/5min in 2016. Taking the four surveys into account there is a cumulative average of 8.09 salmon fry/5min which is below the 17 salmon fry threshold.

Table A.7.2.3: Site s	pecific results of	CWEF on the Glenn	a catchment in 2016
	peenie resuits of		

Site Num	Irish Grid Ref	Stream Order	Riffle Grade	Sal Fry Captured	Exclude Reason	SalFry5min
001	B 91061 29628	4	2	6	Include	6
002	B 90905 28916	4	2	9	Include	9
003	B 91631 26775	3	3	5	Include	5
004	B 91523 26335	3	3	4	Include	4
005	B 91580 24093	3	3	0	Include	0
006	B 90990 26768	3	3	0	Include	0

A.7.3.River Tullaghobegly

IFI Salmon Catchment #: 2016 survey date: Mean Salmon Fry/5 min (2016): **CWEF Index:**

Sampling carried out by: Owen Kelly **Cornelius McMullen** Paul Burke

30/8/16 Survey not complete 8.69 fry/5min.

235

Fish Species Present:

Brown Trout Salmon

Figure A.7.3.1: Length distribution of salmon captured in 2016 CWEF survey on the Tullaghobegly Catchment.



Figure A.7.3.2: Comparison of mean salmon fry/5min for all surveys on the Tullaghobegly catchment to 2016.



Table A.7.3.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.7.3.2: Conservation limits and provisional returns on the Tullaghobegly catchment along with the 2016 CWEF fishing result.

Fry Ye	Site	Efficie Belo Thresł	Strea	Othe Exclusi	Not San	Km p Included	Spawr Yea	Fry Ye	1SW	1SV Predic Surpl	Statu	Mea Salmon 5mi Annu Salmon 5mi
ar	s Ied	ncy v	άз	er ons	npled	er d Site	r	ear	Ę	/ ted us	SI	n Fry/ Ial Fry/
2008	3					5.73	2007	2008	225	147	C&R	8.33
2010	9		1			1.72	2008	2009	225	121	C&R	
2016	2					8.60	2009	2010	225	86	C&R	9.05
							2010	2011	225	35	C&R	
							2011	2012	225	35	C&R	
							2012	2013	225	8	C&R	
							2013	2014	223	99	C&R	
							2014	2015	223	103	Brown Tag	

2015

2016

223

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

This survey, the third of this catchment in the 2007 to 2016 period, was carried out during August 2016. Previous CWEF surveys of the catchment have identified sites suitable for surveying; in 2010 nine sites were included in the calculation of the annual CWEF average. This year, due to high water levels only 2 sites were completed. Salmon fry were absent from both.



Map A.7.3.1: Showing locations of 2016 survey sites on the Tullaghobegly

Table A.7.3.3: Site specific results of CWEF on the Tullaghobegley catchment in 2016, also included are the previous results observed at the same sites at previous surveys (sites not fished this year are not included).

Site Number	Crid Dof	Stream	Riffle	Salmon Fry/5min					
	Gria kei.	Order	Grade	2008	2010	2016			
007	B 93745 26144	4	1	15	0	0			
008	B 93815 25271	4	3		0	0			

A.7.4. River Ray

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: **Owen Kelly** Cornelius McMullen Paul Burke

Figure A.7.4.1: Length distribution of salmon captured in 2016 CWEF survey on the Ray Catchment.



Table A.7.4.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

236 30/8/16 Survey Not Complete 12.88 fry/5min.

Fish Species Present:

Brown Trout European Eel Salmon

Figure A.7.4.2: Comparison of mean salmon fry/5min for all surveys on the Ray catchment to 2016.



Table A.7.4.2: Conservation limits and provisional returns on the Ray catchment along with the 2016 CWEF fishing result.

C&R

12.88

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Mean Salmon Fry/ 5min Annual Salmon Fry/ 5min
2008	8					5.64	2007	2008	432	-66	C&R	6.43
2011	11					4.10	2008	2009	432	-12	C&R	
2014	12					3.76	2009	2010	432	-14	C&R	
2016	7					6.45	2010	2011	432	15	C&R	14.89
							2011	2012	432	15	C&R	
							2012	2013	432	-99	C&R	
							2013	2014	434	20	C&R	17.31
							2014	2015	121	10	C 8. P	

2015

2016

434 1SW = One Sea Winter ; CL= Conservation Limit.

-28

This survey, the fourth of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. Previous CWEF surveys of the catchment have identified sites suitable for surveying; in 2014 12 sites were included in the calculation of the annual CWEF average. This year, due to high water levels only 7 sites were surveyed. Salmon fry were present at five sites. The maximum fry catch was 18 salmon at Site 4.





Conclusion

The salmon fry catches at those sites that were surveyed in 2016 were lower than had been observed at previous surveys but the survey was incomplete.

Table A.7.4.3: Site specific results of CWEF on the Ray catchment in 2016, also included are the previous results observed at the same sites at previous surveys (sites not fished this year are not included).

Site	Crid Dof	Stream	Riffle Grade	Salmon Fry/5min						
Number	Gria kei.	Order		2008	2011	2014	2016			
004	B 95878 29760	4	2		25.67	51.7	18			
005	B 95993 28757	4	2		13.59	24.09	2			
006	B 96953 27822	3	3	9.33	1.22	0	1			
007	B 98259 27227	3	3	0	0	0	0			
009	B 96070 30826	3	2		41.36	27.18	2			
010	B 96287 28121	3	3	2	0	0	0			
013	B 95488 30036	2	3	6.11			3			

A.7.5.River Lackagh

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: Cornelius McMullen Owen Kelly Paul Burke Seamus Bradley

Figure A.7.5.1: Length distribution of salmon captured in 2016 CWEF survey on the Lackagh Catchment.



Figure A.7.5.2: Comparison of mean salmon fry/5min for all



Table A.7.5.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.7.5.2: Conservation limits and provisional returns on the Lackagh catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry/ 5min	Mean Salmon Fry/ 5min
2008	7			3		9.06	2007	2008	1083	-445	Closed	18.86	
2009	9			3		7.55	2008	2009	1083	-420	Closed	15.82	
2011	12			2		6.47	2009	2010	1083	-423	Closed		
2012	11			3		6.47	2010	2011	1083	-504	Closed	19.20	
2016	6					15.11	2011	2012	1083	-504	Closed	23.57	
							2012	2013	1083	-503	Closed		
							2013	2014	234	-118	Closed		
							2014	2015	235	-117	C&R		
							2015	2016	235	-43	C&R		19 02

240

31/8/16 - 8/9/16 Survey Not Complete 19.02 fry/5min.

Fish Species Present:

Brown Trout

Minnow

Salmon

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

This survey, the fifth of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. Previous CWEF surveys of the catchment have identified sites suitable for surveying; in 2014 twelve sites were included in the calculation of the annual CWEF average. This year, due to high water levels only 6 sites were surveyed. Salmon were present at all sites. The modal length category of 0+ fry caught was 4.5cm.



Map A.7.5.1: Showing locations of 2016 survey sites on the Lackagh.

Conclusion

The results from those sites that were surveyed in 2016 were comparable or slightly better than those observed in previous surveys. Due to the survey being incomplete the results should only be considered as a minimum CWEF estimate.

Table A.7.5.3: Site specific results of CWEF on the Lackagh catchment in 2016, also included are the previous results observed at the same sites at previous surveys (sites not fished this year are not included).

Site		Stream	Riffle			Salmon Fry/5min				
Number	Grid Ket.	Order	Grade	2008	2009	2011	2012	2016		
003	B 99336 18288	3	2	13		10.91	36	19		
004	B 98776 17614	3	3	14		10.67	18	15		
005	C 11842 31062	2	1	35.88	14.4	23.75	17.64	16		
008	C 11111 29072	3	3	0	0	0	0	1		
016	C 12264 31652	2	2			14.67	12.27	24		
018	B 99113 18030	3	3		29.85			31		

A.7.6.River Leannan

IFI Salmon Catchment #:
2016 survey dates:
Mean Salmon Fry/5 min (2016):
CWEF Index:

Sampling carried out by: Owen Kelly Cornelius McMullan James Doherty Paul Burke Seamus Bradley

Figure A.7.6.1: Length distribution of salmon captured in 2016 CWEF survey on the Leannan Catchment.



248 1/8/16-31/8/16 Survey Not Complete 18.41 fry/5min.

Fish Species Present:

Brown Trout European Eel Salmon 3-spined Stickleback.





Table A.7.6.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Table A.7.6.2: Conservation limits and provisional returns on the Leannan catchment along with the 2016 CWEF fishing result.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sample	Km per Included Sit	Spawning Year	Fry Year	1SW CL	1SW Predicted Surplus	Status	Annual Salmon Fry, 5min	Mean Salmon Fry, 5min
2008	20				0		2007	2008	2619	2020	Classed	7.41	
2008	29					7.55	2007	2008	3018	-2820	Closed	7.41	
2009	29					7.55	2008	2009	3618	-2620	Closed	8.73	
2010	29					7.55	2009	2010	3618	-2619	Closed	16.71	
2011	28	1				7.55	2010	2011	3618	-2609	Closed	12.36	
2012	28				1	7.55	2011	2012	3618	-2612	Closed	21.51	
2013	26					8.42	2012	2013	3618	-2612	Closed	19.51	
2014	26					8.42	2013	2014	516	-410	Closed	20.87	
2015	25	1				8.42	2014	2015	516	-409	Closed	15.27	
2016	20					10.95	2015	2016	516	-409	C&R		18.41
2010	20					10.95	2015	2010	510	403	Can		10.41

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

This survey, the eighth of this catchment in the 2007 to 2016 period, was carried out during Sept 2016. Previous CWEF surveys of the catchment have identified sites suitable for surveying; in 2015 twenty five sites were included in the calculation of the annual CWEF average. This year, due to high water levels only 20 sites were surveyed. Salmon were present at 16 sites. The maximum catch was 53 at Site 9. The modal length category of 0+ fry caught was 4.5cm.

Conclusion

The results from those sites that were surveyed in 2016 were comparable with those observed in previous surveys.

Table A.7.6.3: Site specific results of CWEF on the Leannan catchment in 2016, also included are the previous results observed at the same sites at previous surveys (sites not fished this year are not included).

Site		Stream	Riffle		Sa	almon Fry/5m	in	
Number	Grid Ref.	Order	Grade	2012	2013	2014	2015	2016
008	C 12588 21655	4	3					9
009	C 02422 14028	4	1	39.11	65.78	70.42	51	53
015	C 00385 13956	4	2	25.38	6.43	21.43	17.5	21
016	C 19019 19448	4	2	30.56	3.62	0	10.57	13
017	C 11925 22178	2	2	1.18	0	0		0
018	C 17013 17222	4	1	11.25	0	2	1	3
019	C 15696 16505	3	1	0			0	0
020	C 14938 21045	4	1	0	17.86	40.38	25	34
021	C 14125 20475	4	3	47.29	13.67	9.83	16	13
022	C 12199 22907	4	2	41	54.98	2	0	0
023	C 10793 23117	4	2	0	6.12	0	0	0
024	C 09643 15275	4	2	20.27	12.22	1.21	3.9	6
027	C 05181 17366	4	3	19.09	20.78	25.71		6
028	C 02269 13466	3	2	21.94	40.1	45.86	16.88	23
029	C 01542 13558	3	2	27.13	17.81	40.59	16.21	29
031	C 01544 13637	4	2	31.25	5.33	41.16	24	24
034	C 09680 14776	4	3				13	2
037	C 18382 18934	4	2				0	3
038	C 09004 13462	4	1	29.63	22.7	23.4	28.31	42
039	C 18760 19189	4	2	4	9.64	1.25		17

Map A.7.6.1: Showing locations of 2016 survey sites on the Leannan.



A.7.7.River Crana

IFI Salmon Catchment #: 2016 survey date: Mean Salmon Fry/5 min (2016): CWEF Index:

Sampling carried out by: Owen Kelly Cornelius MCmullan James Doherty

Figure A.7.7.1: Length distribution of salmon captured in 2016 CWEF survey on the Crana Catchment.



Table A.7.7.1: Details of numbers of sites included in and excluded from the CWEF analysis along with site density achieved each year.

Fry Year	Sites Included	Efficiency Below Threshold	Stream order<2	Other Exclusions	Not Sampled	Km per Included Site
2009	23	1				3.61
2016	2					43.29

253 5/9/16 Survey not complete 15.74 fry/5min.

Fish Species Present:

Brown Trout Salmon

Figure A.7.7.2: Comparison of mean salmon fry/5min for all surveys on the Crana catchment to 2016.



Table A.7.7.2: Conservation limits and provisional returns on the Crana catchment along with the 2016 CWEF fishing result.

_	Spawning Year	Fry Year	1SM CL	1SW Predicted Surplus	Status	Mean Salmon Fry/ 5min Annual Salmon Fry/ 5min
-	2007	2008	1119	431	Open	
	2008	2009	1119	611	Open	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	

1SW = One Sea Winter ; CL= Conservation Limit.

This survey, the second of this catchment in the 2007 to 2016 period, was carried out during Sept 2016 but is incomplete as only 2 sites were surveyed. Previous CWEF surveys of the catchment have identified sites suitable for surveying; in 2015 twenty-three sites were included in the calculation of the annual CWEF average. This year, due to high water levels only 2 sites were surveyed. Salmon were present at site 22. The modal length category of 0+ fry caught was 6.5cm.





Conclusion

The Crana had spawning high up in the system in 2016. These limited data should not be used to support any scientific assessment of the catchment.

Site	Crid Dof	Stream	Riffle	Salmon I	on Fry/5min		
Number	Grid Kei.	Order	Grade	2009	2016		
021	C 45227 33765	3	2	18.75	12		
023	C 44353 34735	2	3	1.40	0		

Table A.7.7.3: Site specific results of CWEF on the Crana catchment in 2009 and 2016.

B. Distribution of other species

B.1.Brown Trout



B.2.Crayfish



B.3. Dace



B.4. Eel



B.5. Flounder



B.6. Gudgeon



B.7. Lamprey



B.8. Margaritifera



B.9. Minnow



B.10.Perch



B.11.Pike



B.12.Sea Trout



B.13. Three-Spined Stickleback



B.14.Stone Loach



Code/River					Fry	Year					Current Index	# Surveys
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		Considered
002/Flurry				5.24					17.15		11.19	2
003/Castletown			26.41				22.96	13.59			20.99	3
004/Fane			16.17			22.09			8.94*		19.13	2
005/Glyde		2.49	17.08	31.61					5.56		14.18	4
006/Dee		8.55	16.92	21.72	20.13				10.51		15.57	5
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				2.36*	10.51	5
016/Dodder					13.93						13.93	1
018/Dargle			1.40	2.53	7.52				4.19		3.91	4
021/Vartry		10.00	15.11	2.54	15.07				5.34	1.75	7.96	5
026/Avoca		3.79	5.56	5.20	18.88	5.15				1.89	7.34	5
028/Owenavorragh				19.76			0.33		4.61		8.23	3
031/Slaney	19.05		15.94	18.42				17.68		8.70	15.96	5
032/Duncormick								11.54			11.54	1
033/Corock					37.11					5.47	21.29	2
034/Owenduff (Wexford)				4.97	10.65	15.91				3.47	8.75	4
037/Barrow	17.72		10.93	8.71	21.23	26.72				8.93*	17.06	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
055/Lickey		12.37							14.14		13.26	2
059/Blackwater (Munster)	22.72	10.67								13.65	13.65	3
060/Bride		10.40		24.70				19.85			18.32	3
061/Tourig						9.40					9.40	1
062/Womanagh		15.45						2.39			8.92	2
064/Owennacurra	15.76										15.76	1
066/Lower Lee (Cork)			0.26								0.26	1
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

c. Overall Catchment-Wide Electrofishing (CWEF mean) results 2007 to 2016

Code/River	Fry Year										Current Index	# Surveys	
-	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	-	Considered	
081/Adrigole							4.01	1.33			2.67	2	
082/Kealincha	0.00								0.00		0.00	2	
083/Lough Fada	3.23								1.68		2.45	2	
084/Croanshagh										23.38	23.38	1	
085/Owenshagh							4.32		6.73		5.53	2	
086/Cloonee						16.18	33.06				24.62	2	
088/Roughty					19.78						19.78	1	
089/Finnihy						8.61	0.00				4.31	2	
090/Blackwater (Kerry)	30.54	15.52	13.35					17.82			19.31	4	
093/Owreagh	8.94						2.07	2.81			4.61	3	
097/Currane								24.51			24.51	1	
098/Inny	24.63		19.78								22.20	2	
099/Emlaghmore	2.07								1.45		1.76	2	
101/Carhan	15.76						6.05	8.61			10.14	3	
102/Ferta	19.42							10.90			15.16	2	
103/Behy	15.41	6.14	4.03	8.71	7.17					2.89	5.79	5	
105/Cotteners		17.42									17.42	1	
107/Maine	31.88	32.81	34.23								32.97	3	
108/Emlagh	10.37	3.66	13.38	3.84	2.59					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 (Kerry)		15.33		26.44			13.02		8.76		15.89	4	
112/Feohanagh			16.61				3.20	12.09			10.64	3	
114/Owenmore (Kerry)	25.07										25.07	1	
115/Scorid										1.86	1.86	1	
115/Glenahoo										1.86	1.86	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			0.67	2	
118/Brick	0.00										0.00	1	
119/Feale							24.15				24.15	1	
120/Galey			12.99								12.99	1	
125/Deel					0.14			0.18		1.87*	0.16	2	
126/Maigue			2.82	16.05			12.05				10.31	3	
128/Shannon Kilcrow				0.69							0.69	1	
128/Shannon Graney				0.19							0.19	1	
128/Shannon Woodford				0.00							0.00	1	
130/Owenagarney (Ratty)							16.97	9.97			13.47	2	
131/Fergus	12.96		4.10	6.84			5.89		6.66		7.29	5	

Code/River	Fry Year										Current Index	# Surveys
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	_	Considered
133/Doonbeg				12.28				17.39		16.14*	14.83	2
134/Skivaleen					14.82				11.68	14.54*	13.25	2
135/Annageeragh							1.82	9.24			5.53	2
142/Inagh								5.31	3.59		4.45	2
143/Aughyvackeen					1.00						1.00	1
145/Kilcolgan			2.51								2.51	1
146/Clarinbridge					7.26						7.26	1
147/Corrib	15.75										15.75	1
148/Knock					12.53						12.53	1
149/Owenboliska (Spiddal)		4.06						4.52			4.29	2
152/Cashla							10.83				10.83	1
154/L. Na Furnace stream									0.00		0.00	1
163/Owenglin			11.57								11.57	1
167/Culfin		30.83									30.83	1
168/Erriff	29.51	24.10	16.03	20.43	20.86	24.45	27.45	24.90	28.52	21.72	25.41	5
171/Carrownisky		18.25				20.60	18.22				19.03	3
172/Bunowen			13.62								13.62	1
173/Owenwee (Belclare)				8.47	7.25	15.27					10.33	3
178/Newport (L. Beltra)	16.06		5.53					17.36			12.99	3
179/Srahmore			4.33								4.33	1
181/Owengarve			5.51					6.19	0.72		4.14	3
185/Owenduff (Bangor)			6.00					6.20			6.10	2
186/Owenmore - MC							27.65				27.65	1
186/Owenmore- Carrowmore (Muinhin)							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				14.65	5
196/Brusna			4.70				14.16	14.74			11.20	3
198/Leaffony	5.76		7.95						1.87		5.20	3
203/Garvogue (Bonnet)	18.41	13.26	16.83	11.31	7.08	18.54					13.41	5
205/Drumcliff				17.72							17.72	1
207/Grange	5.75		3.29						4.56		4.53	3
208/Duff	7.84	9.31	18.59	25.16							15.23	4
210/Erne		7.37	0.17	0.08	0.00	0.00	0.00	1.60	1.16	1.25	0.80	5
211/Abbey							7.20	28.14			17.67	2
212/Ballintra			10.27				13.40	18.07			13.91	3
213/Laghy			8.58				14.97	11.02			11.52	3
214/Eske		13.10	16.99	16.30					13.45		14.96	4
215/Eany				15.86		30.08			12.89		19.61	3
216/Oily			9.49		33.68			16.62			19.93	3

Code/River					Fry	Year					Current Index	# Surveys
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		Considered
217/Bungosteen					25.12		17.09				21.11	2
219/Glen (Ballyshannon)				19.44					18.37		18.91	2
220/Owenwee (Yellow R)	21.45	5.00	14.81			20.31	19.65				16.24	5
221/Bracky		10.82				21.57		12.24			14.88	3
222/Owentocker		20.06									20.06	1
226/Owenamarve			3.76				2.64	1.00			2.47	3
228/Gweedore (Crolly R.)		15.99			11.32						13.65	2
229/Clady		16.12				37.21					26.67	2
234/Glenna			16.80		3.77		7.77			4.00	8.09	4
235/Tullaghobegly		8.33		9.05						0.0*	8.69	2
236/Ray		6.43			14.89			17.31		3.61*	12.88	3
240/Lackagh		18.86	15.82		19.20	23.57				17.50*	19.36	4
248/Leannan	9.47	7.41	8.73	16.71	12.36	21.51	19.51	20.87	15.27	17.05*	17.90	5
249/Swilly		9.33	7.36				18.08	8.05			10.71	4
250/Isle (Burn)						2.12					2.12	1
251/Burnfoot		7.77		2.90							5.33	2
252/Mill (Letterkenny)				0.00					0.00		0.00	2
253/Crana			15.74							6.00*	15.74	1
256/Clonmany		16.61		6.59					4.21		9.14	3
257/Straid				0.20					0.00		0.10	2
258/Donagh				4.25					0.68		2.46	2
259/Glennagannon			16.65		4.05		7.13				9.28	3
261/Culoort				4.03					0.00		2.02	2
Quin									7.48		7.48	1



D. Boxplots: CWEF results included in analysis for each catchment >2 surveys

Survey Year



Survey Year







Survey Year
