LOUGHS AGENCY OF THE FOYLE CARLINGFORD AND IRISH LIGHTS COMMISSION

Loughs Agency
Gníomhaireacht na Lochanna
Factrie fur Loughs

Foyle Area and Tributaries Catchment Status Report 2018

Conservation and assessment of fish populations and aquatic habitats

Mark McCauley & Leo Deehan

December 2019

Conservation actions and assessments on fish populations and aquatic habitats are presented for 2018. The status reports have been designed to facilitate quick reference to contemporary information. Additional information can be found in associated publications and in previous status reports available on the Loughs Agency website www.loughs-agency.org

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1.0 INTRODUCTION

The Loughs Agency continued to implement the freshwater fisheries monitoring programme throughout 2018 in the Foyle and Carlingford areas. The annual cycle of reporting, survey preparations, logistical arrangements and field surveys continued with the support of the freshwater fisheries monitoring team.

The rare fish monitoring project continued in the spring of 2018 with a targeted European smelt survey in the Mourne catchment which once again identified Smelt as being present at spawning time during mid-March. This also increased the upstream limit of known European smelt distribution within the Mourne Catchment. European smelt play an important role in the biodiversity of the Foyle system and are an important prey item for numerous fish species of commercial and recreational interest. It is important that we develop our understanding of the ecology of this species so that we can protect and conserve the niche habitats that are crucial to the completion of its life cycle.

The annual deployment of the rotary screw trap on the River Faughan to monitor out-migrant Salmon and Sea trout smolts and to collect key information from all fish passing through the trap was conducted during April and May. The 2018 trapping season saw approximately 8500 Salmon smolts and 1800 Sea trout smolts captured during the five week sampling effort.

The annual Water Framework Directive fish monitoring project was also completed in 2018. Nine WFD fish surveillance monitoring stations were surveyed within the Loughs Agency jurisdiction in 2018. All nine sites were within Northern Ireland. Two of the sites surveyed were classified as having ‘high’ ecological status, three as ‘good’ status, three as ‘moderate’ status and one site was classified as having ‘poor’ ecological status.

Adult migratory fish trapping took place during June and July on the River Mourne at Sion Mills and the River Finn at Killygordon where the trap and fisheries monitoring stations were used to collect key biological data on the fish species encountered. Despite a prolonged settled period that began in May and continued through July, numbers of returning adult fish were still moving up through the system over this period. As part of ongoing studies any Sea trout captured in the traps were tagged with ‘T-Bar Anchor Tags’ in an effort to gain a

greater understanding of the ecology and migration patterns of this species in the Foyle Catchment, and to inform future management of local populations.

During the month of August bathymetry surveys were conducted on the Gortin Lakes (New Lough and Oak Lough) and Lough Lee. In September a Water Framework Directive compliant lake fish survey was carried out on Lough Mourne, within the Foyle area. The fish stock assessment noted the presence of three fish species including Roach, Pike and European Eel. Although Roach were the most common fish encountered in the survey, Roach stocks have declined significantly since the last survey in 2010. This may be due to the presence of the parasitic tapeworm (*Ligula intestinalis* L). During this most recent survey Brown trout were not recorded in Lough Mourne which may indicate issues with habitat fragmentation due to the 'V' notch weir near the outflow on the Mournebeg River.

Annual Habitat impacts, Invasive species and Barriers to Migration (HIB's) surveys were concluded on the Finn catchment. The data collected by the freshwater fisheries monitoring team from 2013 to 2018 will help to direct a series of instream and riparian habitat improvement works as part of the EU INTERREG VA Catchment CARE (Community Actions for Resilient Eco-systems) project.

During March 2018 collaborative surveys and planning was conducted in partnership with the Woodland Trust as part of developing the Burntollet native riparian tree planting project. A collaborative, bankside restoration project was also undertaken on the Culdaff River, involving local anglers, Inishowen Rivers Trust and the Wild Trout Trust with the aim of undertaking habitat improvements which was to prevent excessive erosion and improve water quality for salmonids.

The 2018 status reports provide a synopsis of the key information collected by the Loughs Agency during the year. Specific project reports are also available which provide more detail on particular aspects of the freshwater fisheries monitoring programme.

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2.0 ATLANTIC SALMON STOCKS SUMMARY

- There were no net fisheries pursued for Atlantic salmon in the Foyle area in 2018. This is due to the continued failure of the River Finn to meet its conservation limits as outlined under the Foyle Area (Control of Fishing) Regulations 2010. Angling is permitted in the River Finn and River Foyle on a catch and release basis only.

- Total declared Atlantic salmon rod catch for the Foyle and Carlingford area in 2018 was 1598. Voluntary catch and release for the Foyle and Carlingford areas was 66%.

- Returning adult Atlantic salmon counts derived from electronic fish counters in 2018 at Sion Mills on the River Mourne were 1214 salmon/grilse, the River Faughan at Campsie Barrage 880, River Roe at Limavady bypass 4305, Strule fish counter in Omagh 990 and the River Finn at Killygordon 3955.

- Total spawning redd counts for the Foyle area were 2760 in 2018/19, slightly above the 5 year average of 2586 redds.

- Juvenile electrofishing surveys within the Foyle system at 440 sites recorded an average of 13 salmon fry (Young of Year).

Loughs Agency Management Strategy for Atlantic salmon

The Loughs Agency uses an audit point management system for monitoring the populations of Atlantic salmon within the Foyle and Carlingford areas.

Population estimates and indices are derived for various life history stages including adult counts from electronic fish counters situated at key locations, spawning redd counts, juvenile electrofishing indices, rod catch and commercial net catches.

Numbers of Atlantic salmon stocks particularly grilse (1SW fish) from southern populations of north east Atlantic stocks are currently at a low point.

International research has highlighted climate change and marine ecosystem change as potential causes for this observed decline. The Loughs Agency is working with colleagues at regional, national and international levels to understand this decline and to implement best practice conservation actions.

2.1 NET FISHERIES

Net fisheries have not been operated in the Foyle area since 2009 (Figure 1). The Foyle Area (Control of Fishing) Regulations 2010 provides various mechanisms for regulating both commercial and rod fisheries for salmon including under Section 3. (1) The Commission shall make a declaration.... if it is satisfied that.... (d) the number of salmon which have migrated upstream of the River Finn fish counter during each of any two of the previous five calendar years has not exceeded 5,410. A declaration under this shall..... (d) in the case of sub-paragraph (d), suspend netting in the River Foyle, Lough Foyle and seaward of Lough Foyle and restrict angling in the River Finn to angling on a catch and release basis only from the date and time specified in the declaration....The Commission can make the relevant declaration ending the suspension of netting and restriction on angling if it is satisfied that the number of salmon migrating upstream of the relevant counter during each of any four of the previous five calendar years has exceeded the number of salmon for that river.

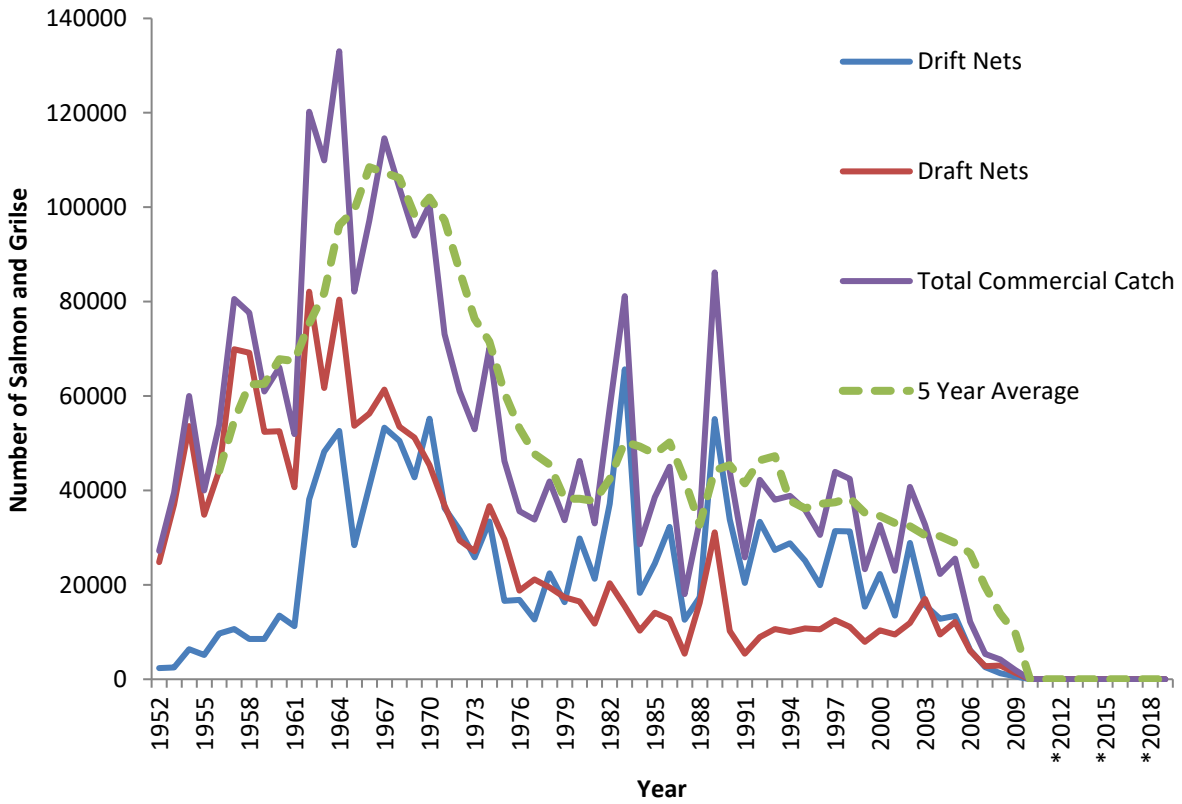


Fig.1 Atlantic salmon total commercial catch 1952-2018 and 5 year average total commercial catch. * Denotes no commercial fisheries conducted since 2009

2.2 ROD CATCH

Total rod catch returns were 13% in 2018 (Figure 2). A total of 1598 salmon/grilse were caught in the Foyle and Carlingford areas in 2018 (Figure 2 & 3). 66% of the reported rod catch of salmon and grilse in the Foyle and Carlingford area were caught and released.

It is your legal obligation to make an accurate and timely rod catch return.

There are a number of important reasons for making rod catch returns.

- How many fish were caught in YOUR RIVER OR LAKE?
- What % of fish were caught and released in YOUR RIVER OR LAKE?
- Is catch and release increasing?
- What species were caught?
- Essential for developing sustainable fishery management policy.
- Screening of future developments (roads, hydro etc.) against fishery interests.
- An important tool for assessing strength of runs.
- Aids with developing access and infrastructure (stiles etc.).
- It is required by law that all rod licence holders make an accurate catch return.
- Facilitates long term trend monitoring.
- Participate in the management of your river (doing your bit).
- At a time of reduced marine survival for Atlantic salmon accurate information is essential for sustainable management.
- Aids in ensuring good decision making so that future generations can enjoy the sport of fishing.
- Ensuring that all species caught are sustainably managed now and in the future.

An unreported fish is a wasted opportunity, for economic development, for conservation, for protection of our fishery resources, for education and for future generations.

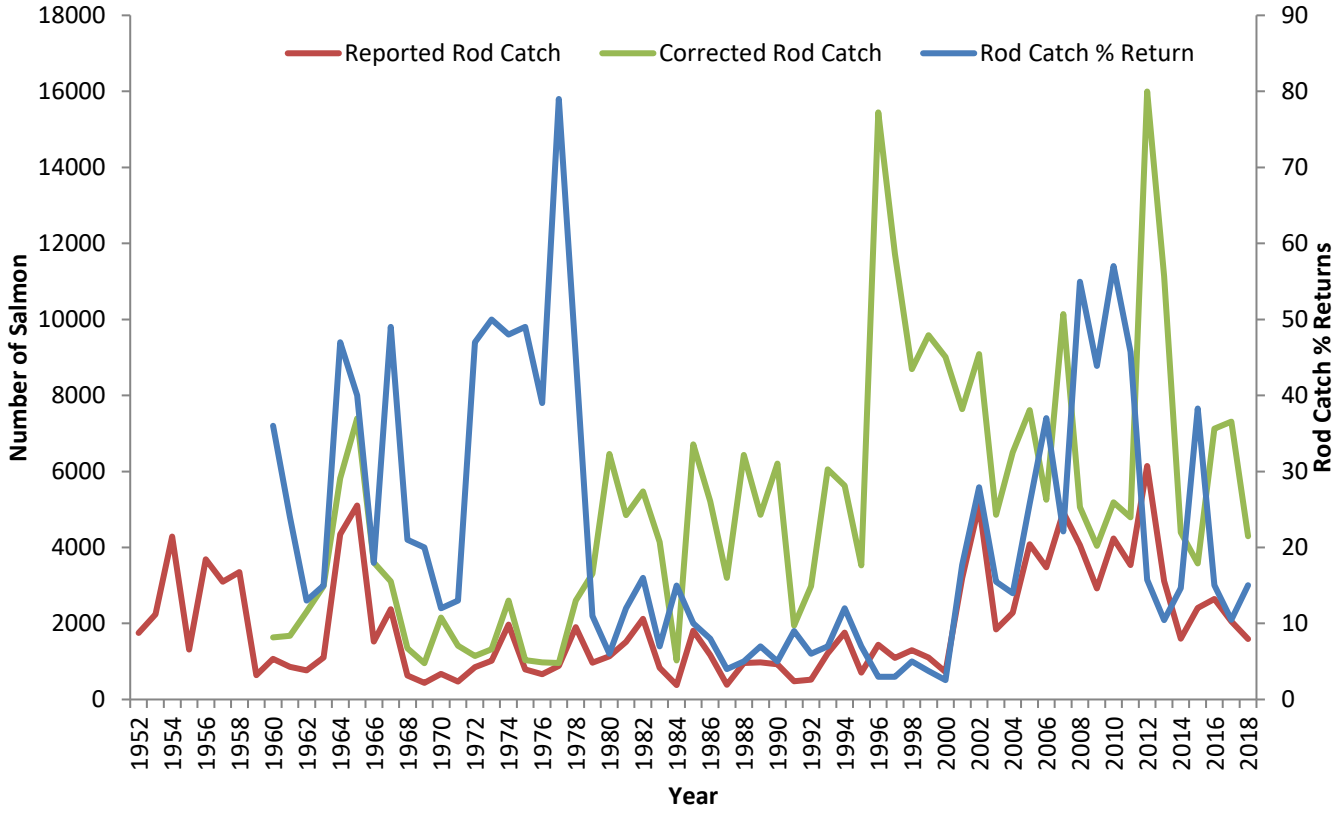


Fig 2. Loughs Agency reported and corrected rod catch with % returns made.

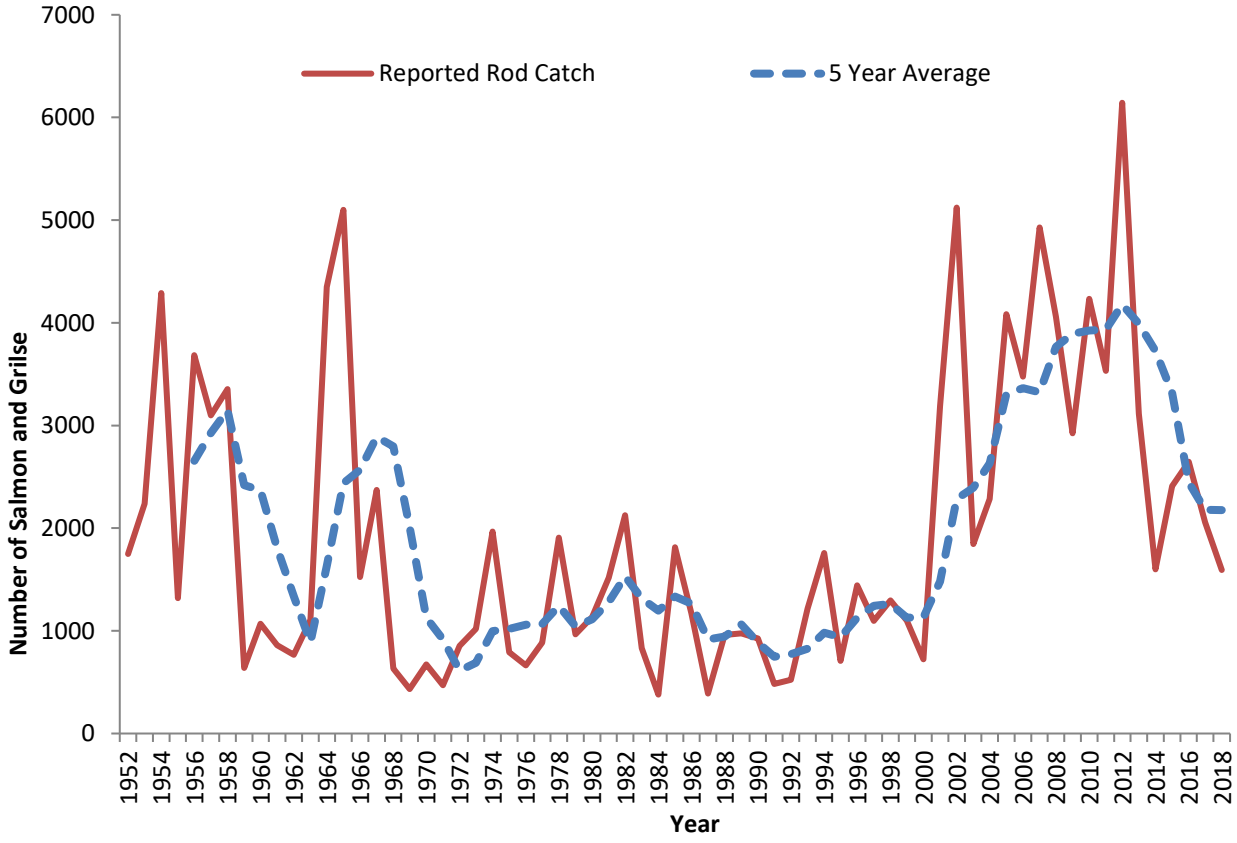


Fig.3 Reported rod catch for salmon/grilse in the Loughs Agency area and 5 year average.

2.3 FISH COUNTERS

The Loughs Agency operates a network of electronic fish counters throughout the Foyle and Carlingford areas to monitor the migration of Atlantic salmon into freshwaters. The counters are used to assess the attainment of conservation limits and management targets for key catchments. In 2018 the key fish counts as recorded by the electronic fish counters on the River Mourne, River Faughan, River Roe and River Finn were; River Mourne 1214 Salmon/ grilse with a 5 year average of 1830. The management target for the Mourne is 8000 and the conservation limit is 6400. River Faughan 880 Salmon/ grilse, however there is no 5 year average as there was no count reported for 2017 due to damage to the counter (the average for 2013-2016 & 2018 was 2239). The management target for the Faughan is 800 and the conservation limit is 640. River Roe 4305 Salmon/ grilse with a 5 year average of 3258. The management target for the Roe is 1833 and the conservation limit is 1466. River Finn 3955 Salmon/ grilse with a 5 year average of 3046. The management target for the Finn is 5410 and the conservation limit is 4328.

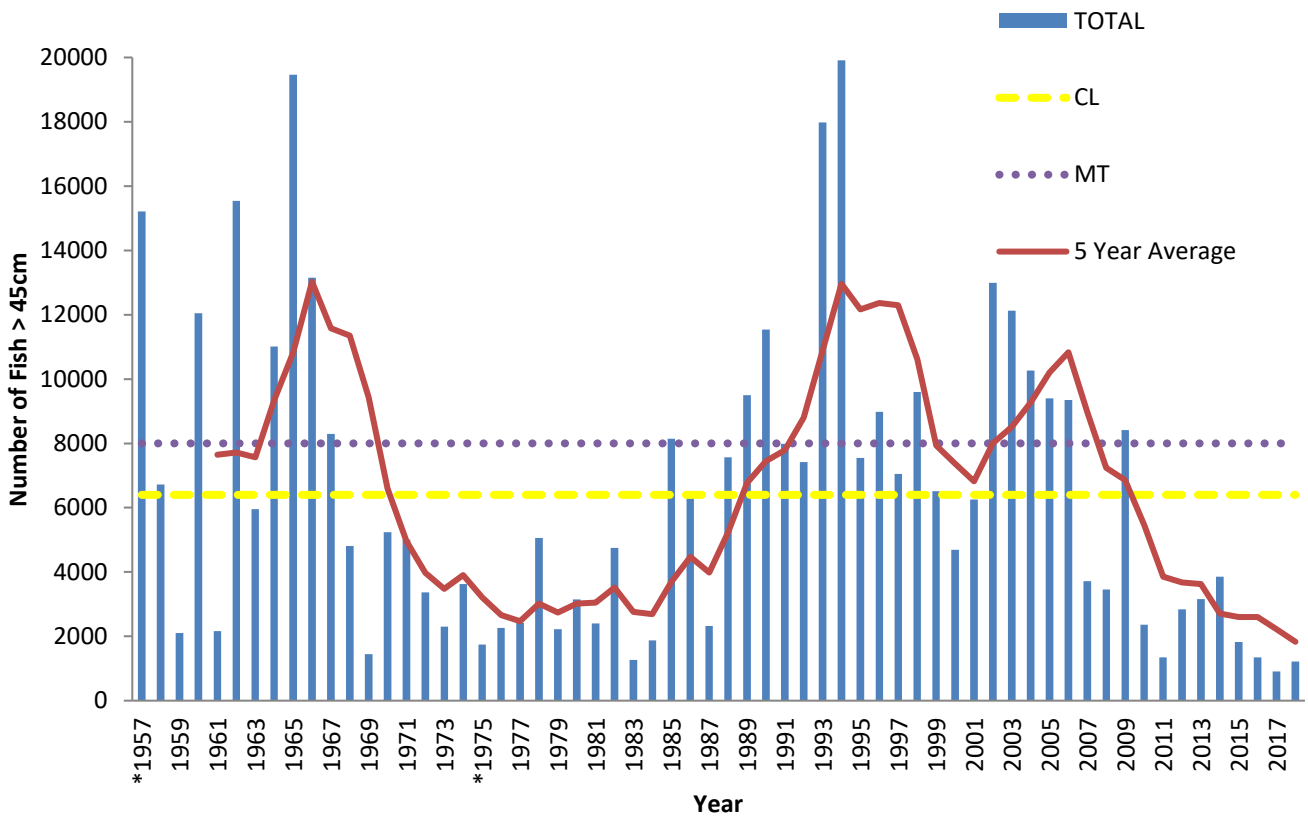


Fig.4 River Mourne annual fish counts with 5 year average, management target (MT) and conservation limit (CL).

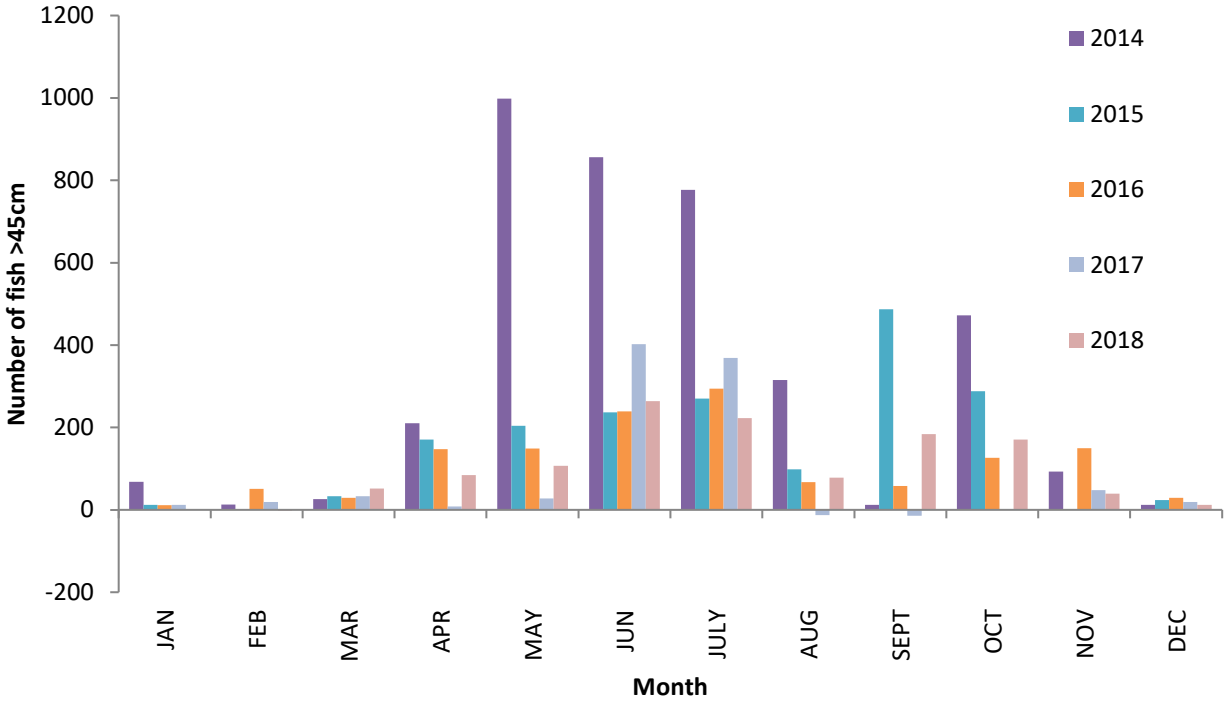


Fig.5 River Mourne monthly fish counts. Negative counts represent kelts moving downstream.

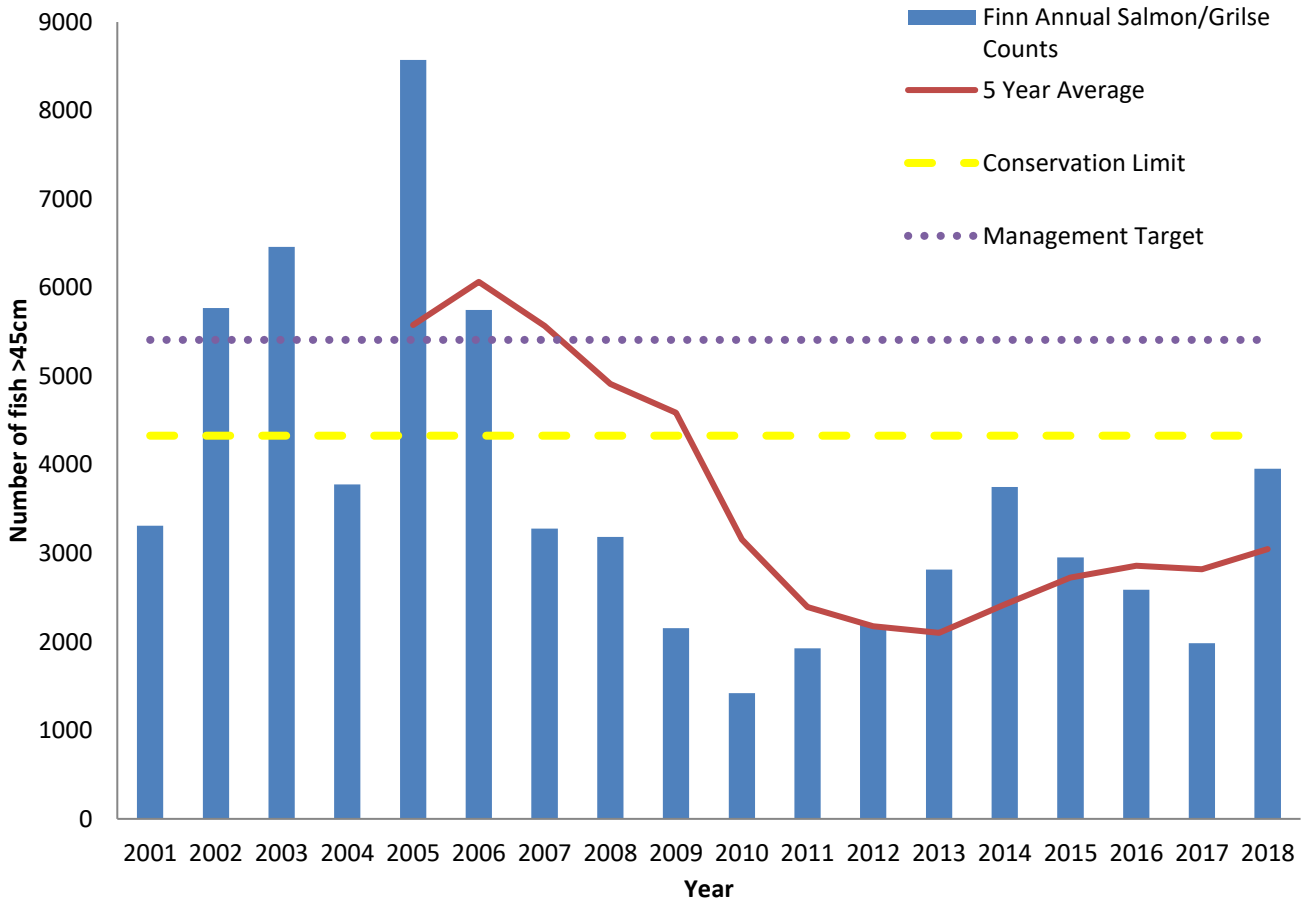


Fig.6 River Finn annual fish counts with 5 year average, management target and conservation limit.

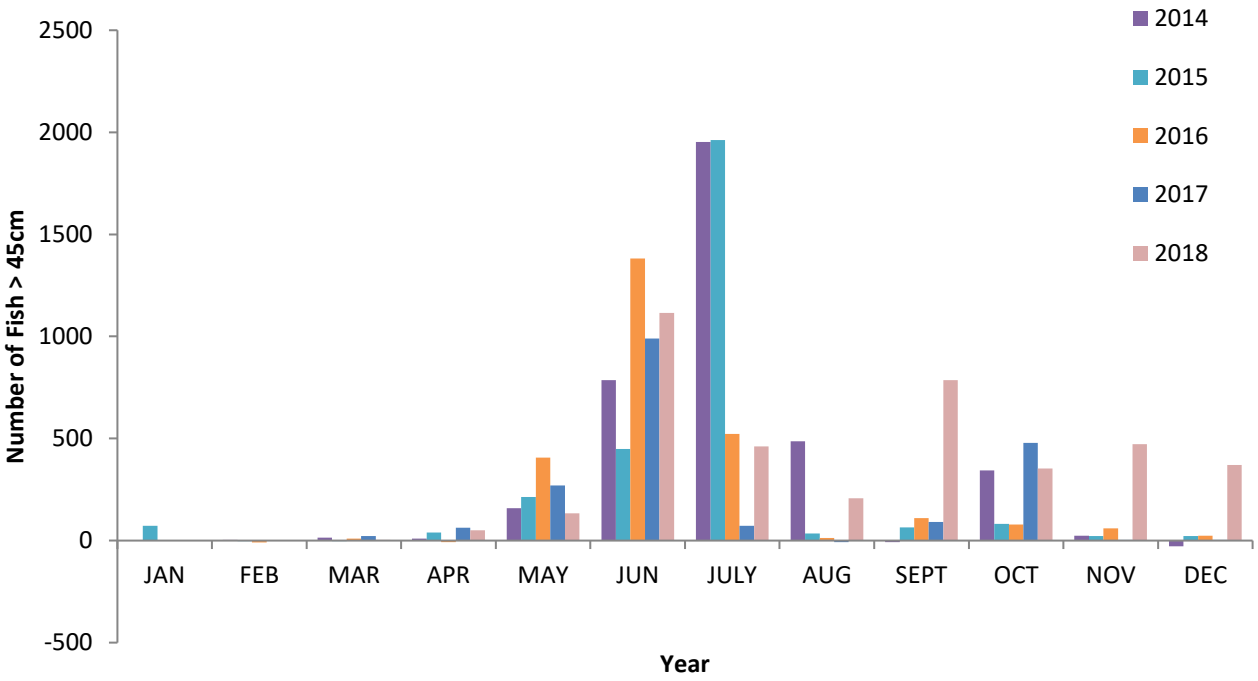


Fig.7 River Finn monthly fish counts. Negative counts represent kelts moving downstream.

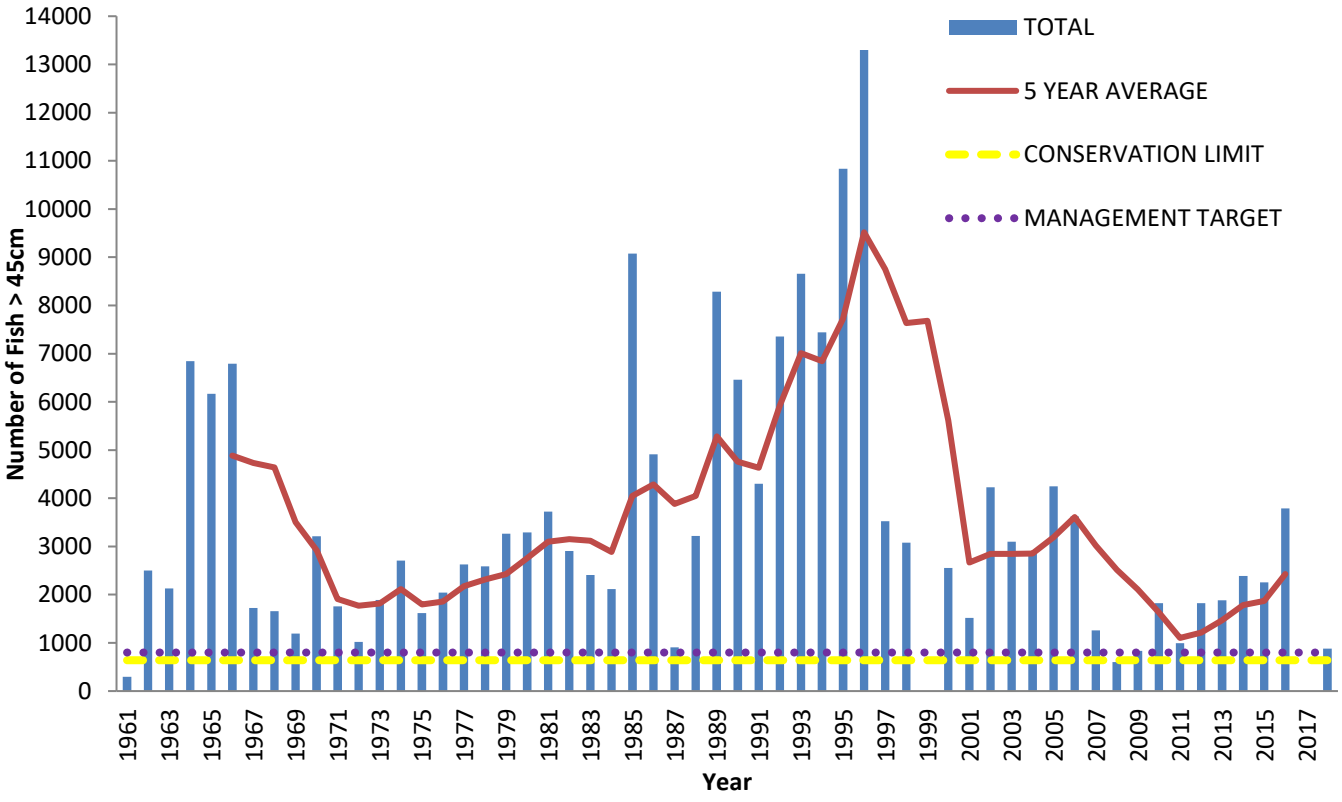


Fig.8 River Faughan annual fish counts with 5 year average, management target and conservation limit. NB: No Data for 2017

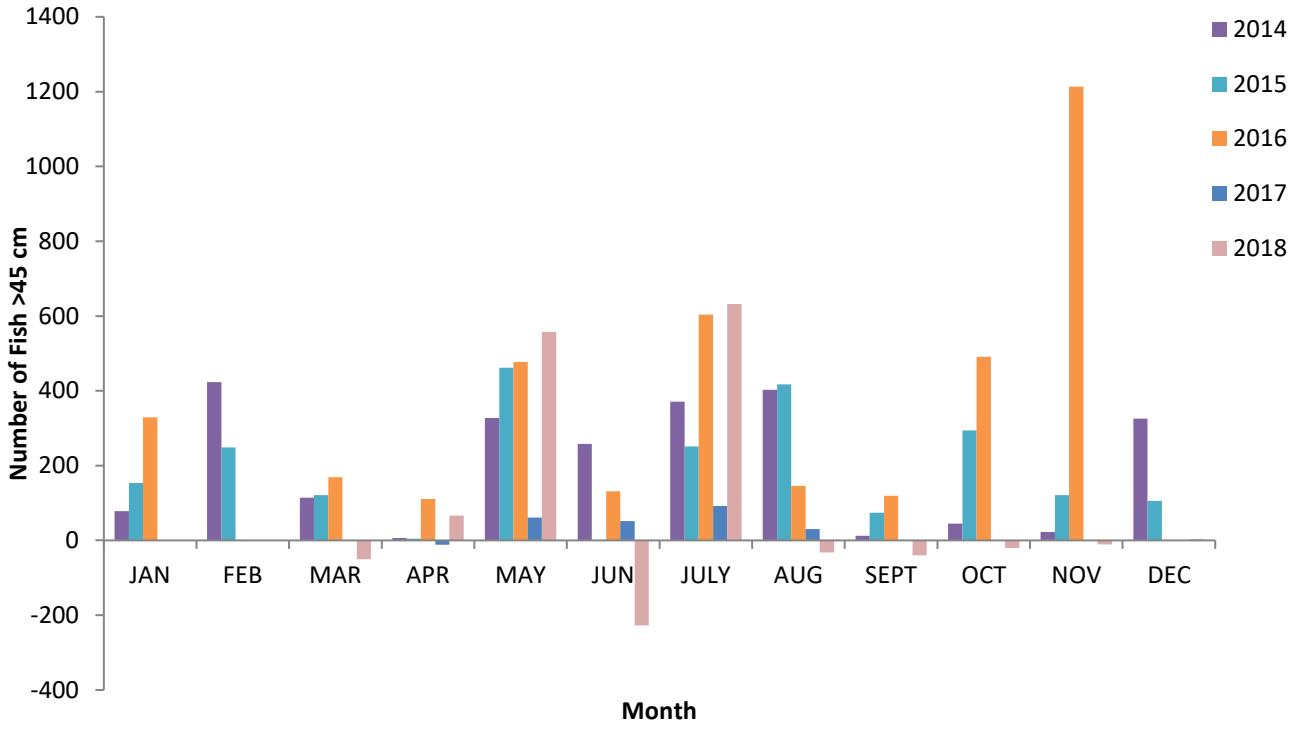


Fig.9 River Faughan monthly fish counts. Negative counts represent kelts moving downstream. NB: No data for 2017

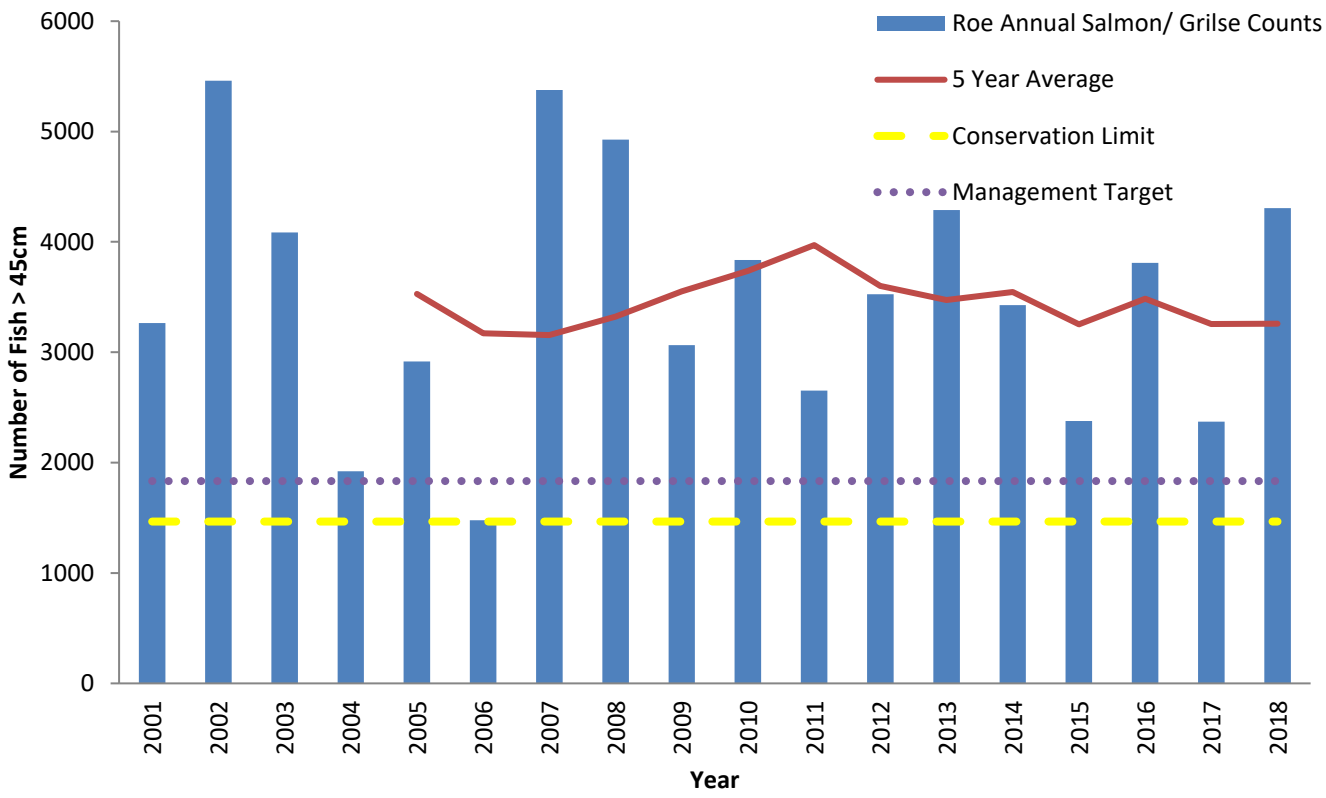


Fig.10 River Roe annual fish counts with 5 year average, management target and conservation limit.

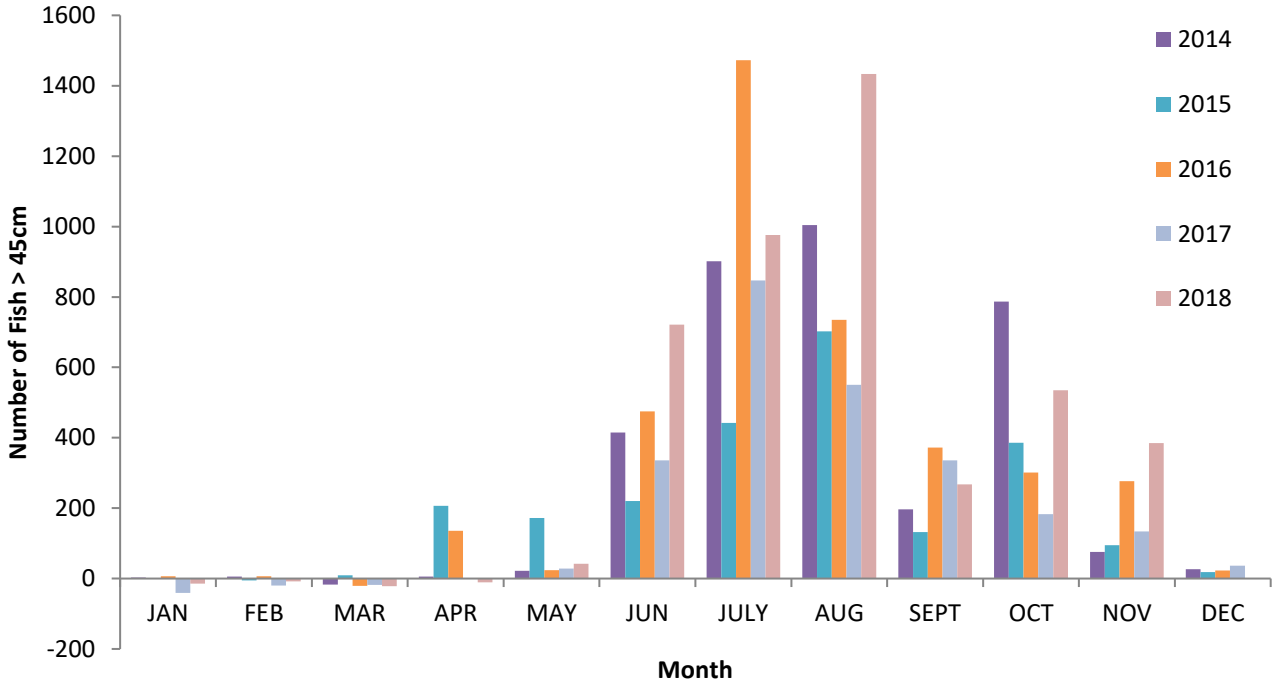


Fig.11 River Roe monthly fish counts. Negative counts represent kelts moving downstream.

2.4 REDD COUNTS

Atlantic salmon redds (spawning nests) are counted on an annual basis and have been shown to be a good indicator of returning population size. Annual redd counts and the 5 year running average are displayed in Figure 12. In 2018/19 there was a total count of 2760 redds with a five year running average of 2586.

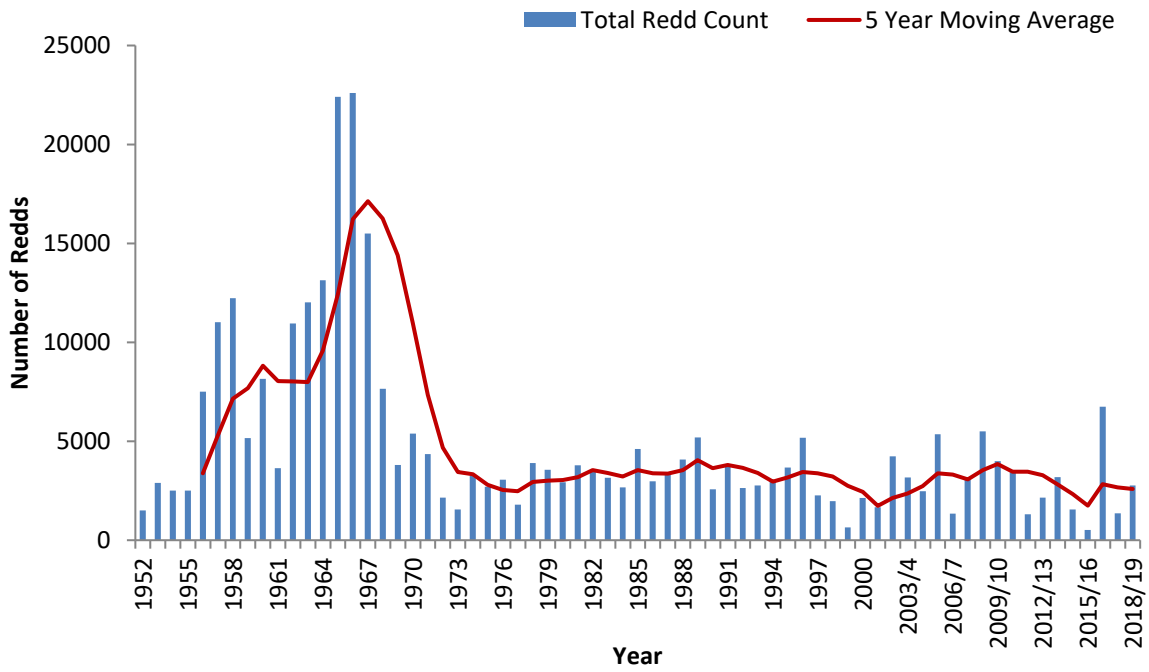


Fig 12. Annual redd counts and 5 year running average.

2.5 JUVENILE ABUNDANCE/ELECTROFISHING SURVEYS

Juvenile Atlantic salmon abundance is measured on an annual basis by following a standardised procedure (Crozier and Kennedy, 1996). Sampling stations are monitored using this semi-quantitative (5 minute timed) electrofishing methodology. Over many years an index has been developed to show trends for individual catchments (Figure 13). In 2018 the mean number of salmon fry (young of year) recorded at 440 sampling stations in the Foyle area was 13.

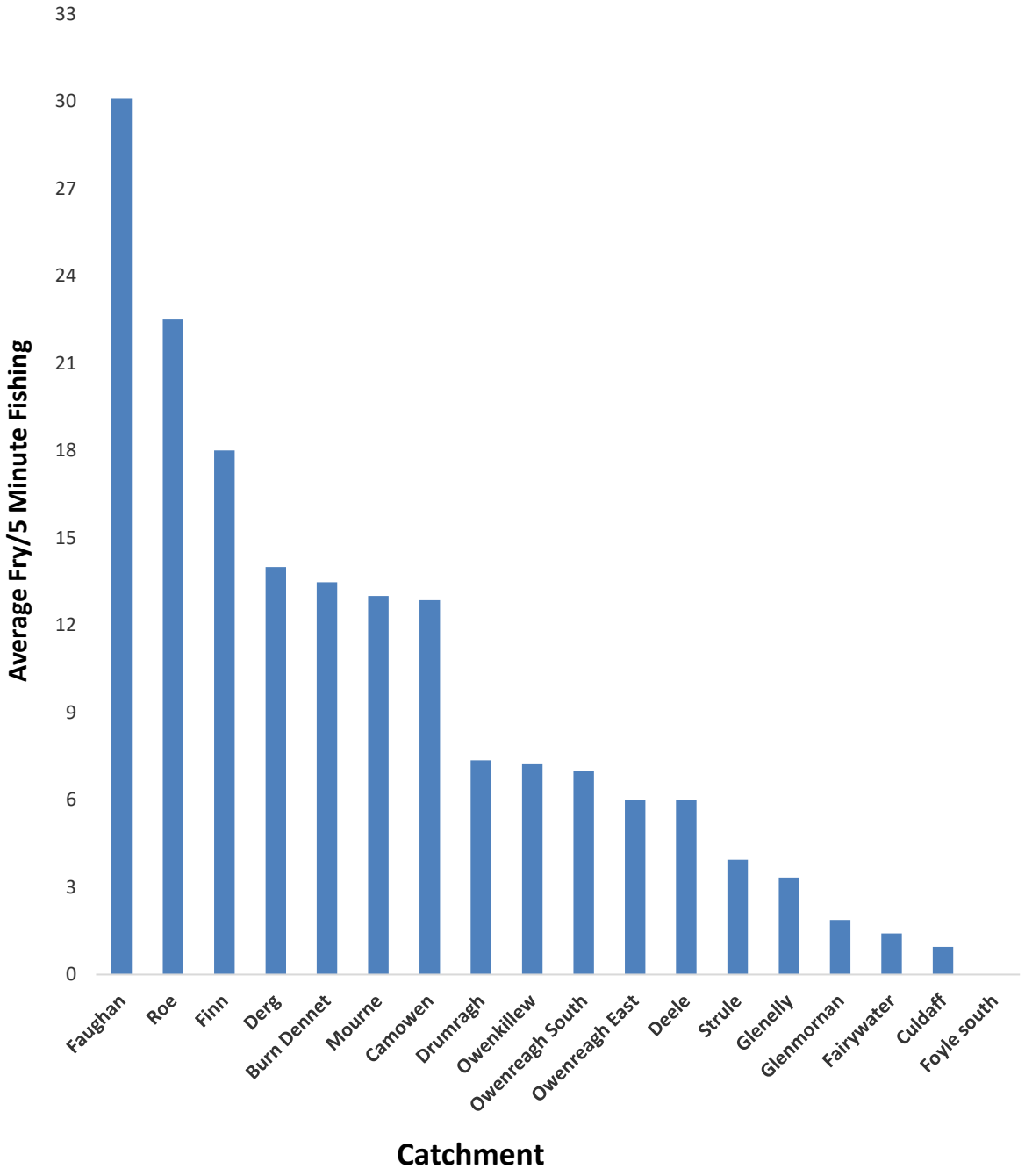


Fig.13 Foyle area Salmon fry index comparison chart 2018.

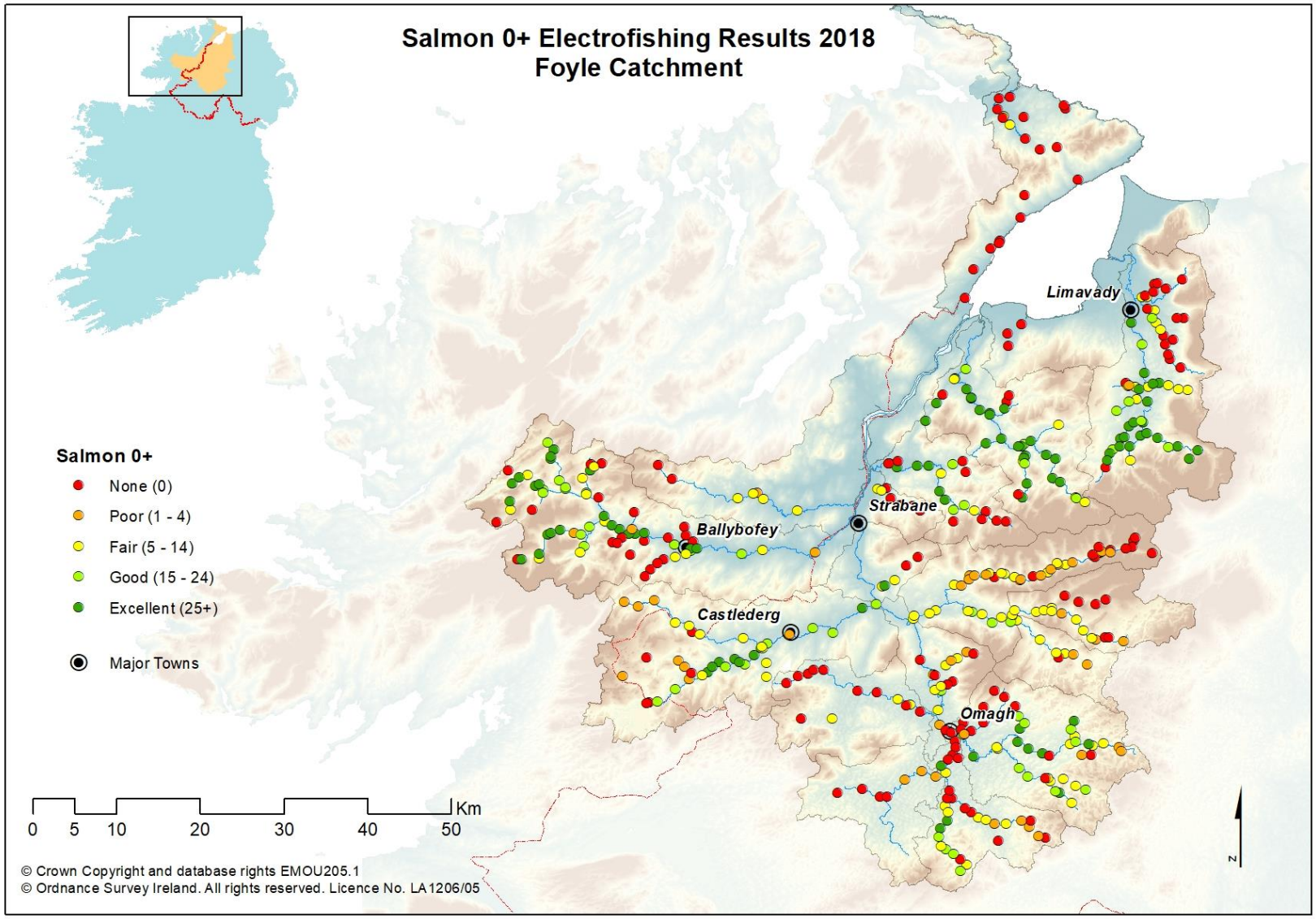


Fig.14 Foyle area salmon fry electrofishing classifications 2018

2.6 MARINE SURVIVAL

Marine survival continues to be of significant concern throughout the southern range of Atlantic salmon in the North East Atlantic. The nearest monitoring station to the Foyle area which provides robust survival data to the International Council for the Exploration of the Seas Working Group on North Atlantic Salmon is the River Bush in Co Antrim. Marine survival rates for One Sea Winter (1SW) grilse pre the mid 1990's was around 30%, in recent years this has fallen as low as 2.4%. A marine survival rate of 3.18% has been calculated for the 2017 cohort returning to the river in 2018. This is a decrease from the 6.66% marine survival rate recorded for the 2015 cohort, and is well below historic highs. A marine survival rate for Multi Sea Winter fish is also calculated a year behind in terms of assessment. The survival rate for 2016 smolt cohort was around 0.66%

The international SALSEA Merge project investigating the marine portion of the Atlantic salmon's life cycle reported in 2011. Further information can be found at http://www.nasco.int/sas/salseamerge_documents.htm this will provide a firm platform on which to develop future salmon management strategy at an international level that takes into consideration the complex lifecycle of Atlantic salmon and its place within both freshwater and marine ecosystems.

2.7 DISCUSSION

As outlined above Atlantic salmon have a complex lifecycle which can be impacted upon by many factors. The impacts cannot always be quantified making it difficult to accurately estimate the number of returning adult salmon/grilse to our rivers each year. An analysis of cohort/age class strength throughout its lifecycle from egg to spawning adult is complicated by numerous factors. These include varying egg survival rates, differing age at smolting, marine survival rates, and time spent at sea/age at spawning and number of spawning migrations made. It is extremely difficult to infer from one life history stage or stages what the strength of any returning cohort will be. This is currently exacerbated by extremely low marine survival rates possibly as a result of altered marine food webs and oceanic prey distribution all in the context of climate change.

3.0 TROUT STOCKS SUMMARY

- In 2018 the total declared Sea trout rod catch for the Foyle and Carlingford areas was 432. Total declared Brown trout rod catch for the Foyle and Carlingford areas was 378.

- In 2018 juvenile electrofishing surveys within the Foyle area at 440 standard sites recorded an average of 9 Trout fry.

- 2018 was noted by many anglers as a better year for Sea trout catches. Reported catch returns in the Loughs Agency area in 2018 was 432 Sea trout, this is a 16% increase on the reported Sea trout rod catch for the previous year.

- The Loughs Agency continued to develop and conduct sea trout research projects in 2018 to monitor local sea trout populations in both the Foyle and Carlingford areas.

- The Loughs Agency is keen to develop a Foyle Sea Trout Partnership in tandem with local angling associations to help monitor the distribution and abundance of Foyle Sea Trout stocks and to contribute towards their conservation and protection

Development of a Loughs Agency Trout Management Strategy

In 2013 the Loughs Agency published its Trout strategy. The strategy contains 19 policies which relate to six main areas:

- **Habitat improvement**
- **Exploitation**
- **Stock management**
- **Barriers to migration**
- **Culverting**
- **Water abstraction and impoundment**

At present Loughs Agency monitor stocks of trout in a number of ways including analysis of rod catch data, and juvenile electrofishing surveys. During 2018 the sea trout monitoring programme on a tributary of the Burndennet was expanded to include the Culdaff River and adult trapping on the River Mourne and River Finn. This is addition to the long term multi species monitoring project on the River Faughan.

3.1 ROD CATCH

Sea trout are a prized quarry in both the Foyle and Carlingford areas but display very different life history strategies to both the resident brown trout and Atlantic salmon. Rod catch provides one of the key 'audit points' for the management of this species. Declared rod catch has highlighted the significant declines over recent decades. It should be noted that sea trout populations fluctuate greatly and like many wild populations of animals they are prone to boom and bust cycles.

Over the duration of the decline in sea trout populations various reasons for the decline have been suggested including spawning habitat loss, barriers to migration, increased numbers of sea lice due to salmon aquaculture, natural population fluctuations, inshore marine ecosystem change, over fishing, pollution of key spawning streams etc. All of these will have impacted the Sea trout populations to some extent. Within the Foyle area Sea trout average weight tends not to exceed 2-3 lbs with larger specimens being quite rare. In the Carlingford area, Sea trout are considerably larger with average weight somewhere between 5-8lbs with larger double figure specimens encountered from time to time. The difference between west and east may be down to the quality and availability of suitable prey species. Irish Sea populations of Sea trout tend to be much larger and may be indicative of less impacted prey species populations. A parallel could be made between documented north coast of Ireland sea bird populations and Irish Sea populations, with Irish Sea populations doing better because of better availability of prey species. North coast of Ireland sea bird populations have been in decline over recent decades, in parallel with the plight of Sea trout.

In the Foyle and Carlingford area the minimum size for retaining a Brown trout or Sea trout is 25.4cm. All Sea trout over 40cm must be tagged and there is a bag limit of 1 Sea trout per day, up to a maximum of 5 during the period from the start of the season to 31st May. A bag limit of 2 Sea trout over 40cm per day applies from the 1st June to the end of the season up to a maximum of 20. There is also a daily bag limit of 4 Brown trout or Sea trout of 40cm or less in length throughout the season. Stricter club/association rules may apply.

Within the Foyle area there is generally a geographic north south divide with sea trout dominant in the northern catchments and brown trout dominant in the southern catchments. Historically the northern catchments and their associated small streams provided excellent spawning and nursery habitat and when associated with high densities of salmon may have been a major reason for seaward migration of juvenile trout in search of prey and less competition. The southern catchments still hold good populations of resident Brown trout with significant angling development potential. These populations however are more susceptible to pollution events. Figures 17 & 18 outline Sea trout rod catch for the Foyle and Carlingford areas. Many catchments within the Foyle area would merit further investigation in relation to developing collaborative Sea trout monitoring projects with interested parties.

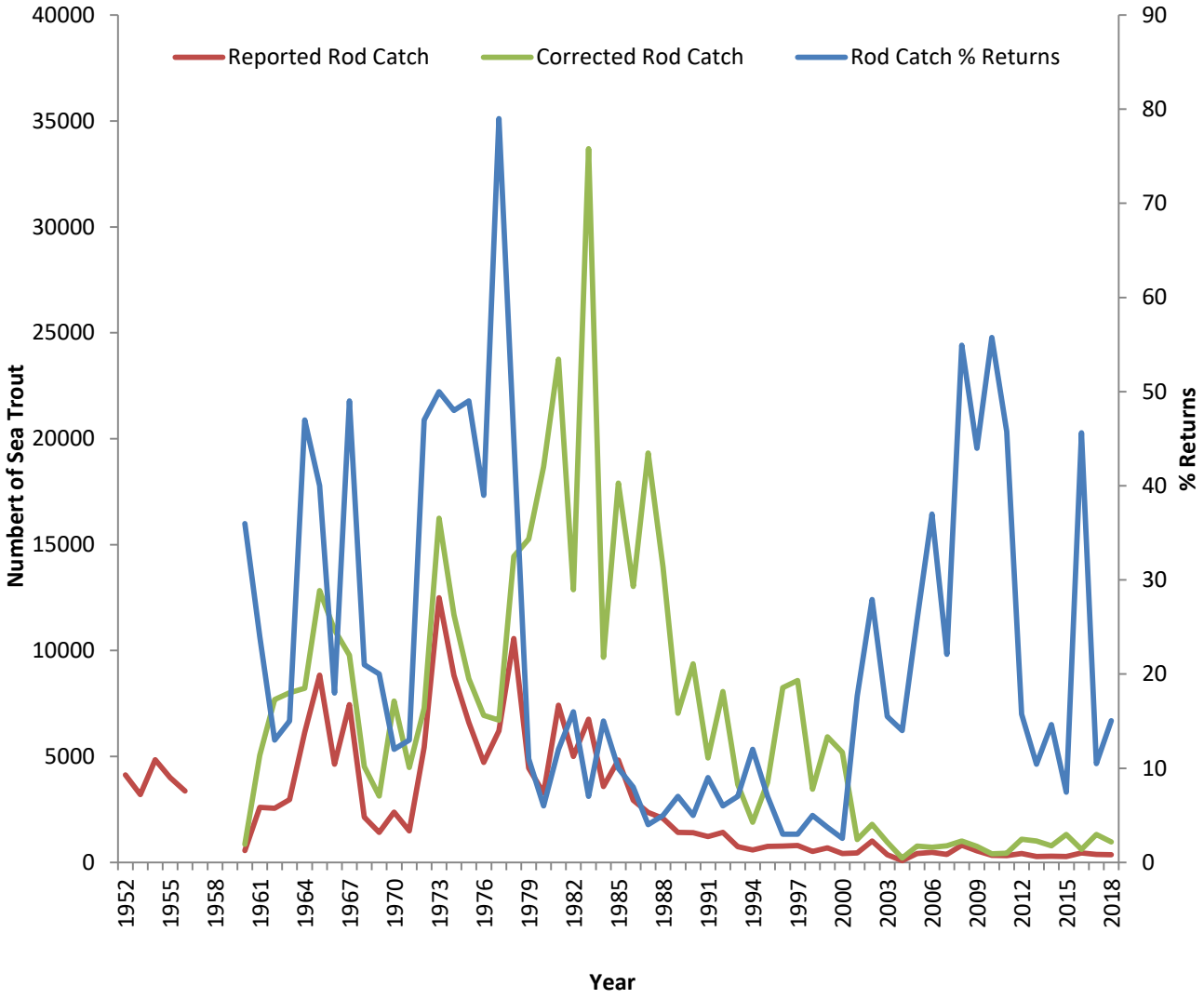


Fig.15 Loughs Agency reported and corrected rod catch (Sea trout) with % returns made.

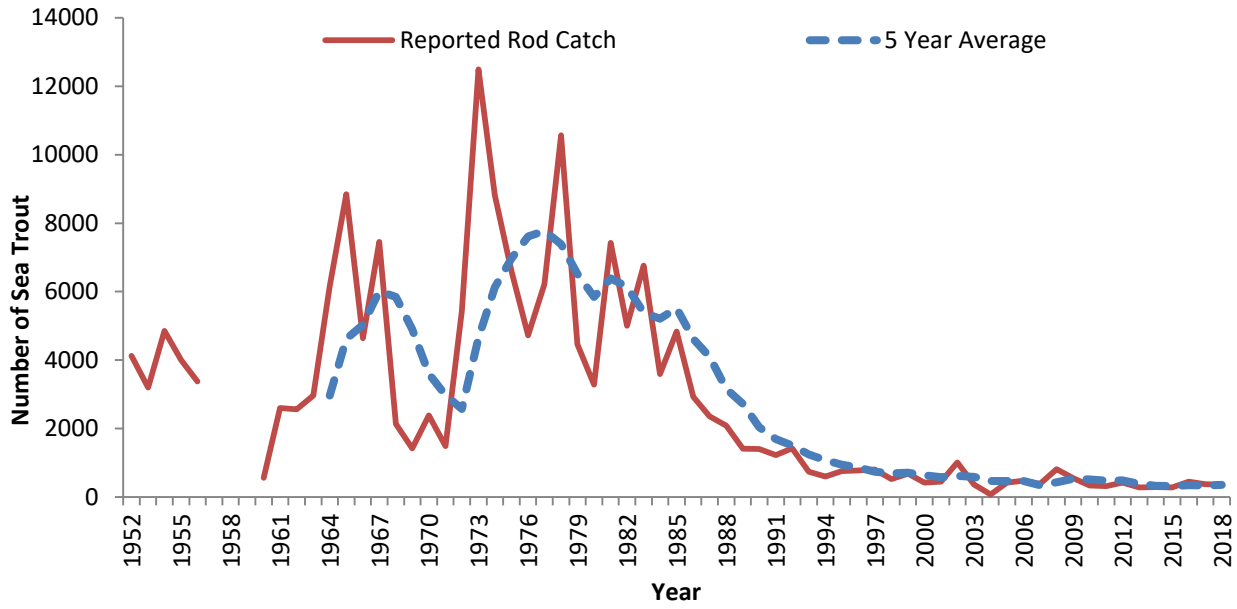


Fig.16 Reported rod catch for Sea trout in the Loughs Agency area and 5 year average.

3.2 JUVENILE ABUNDANCE/ELECTROFISHING SURVEYS

Juvenile Trout abundance measured on an annual basis by following the same standardised procedure (Crozier and Kennedy, 1996). Sampling stations are monitored using this semi-quantitative (5 minute timed) electrofishing methodology. Over many years an index has been developed to show trends for individual catchments (Fig. 19). In 2018 the mean number of trout fry (young of year) recorded at 440 monitoring stations within the Foyle area was 9.

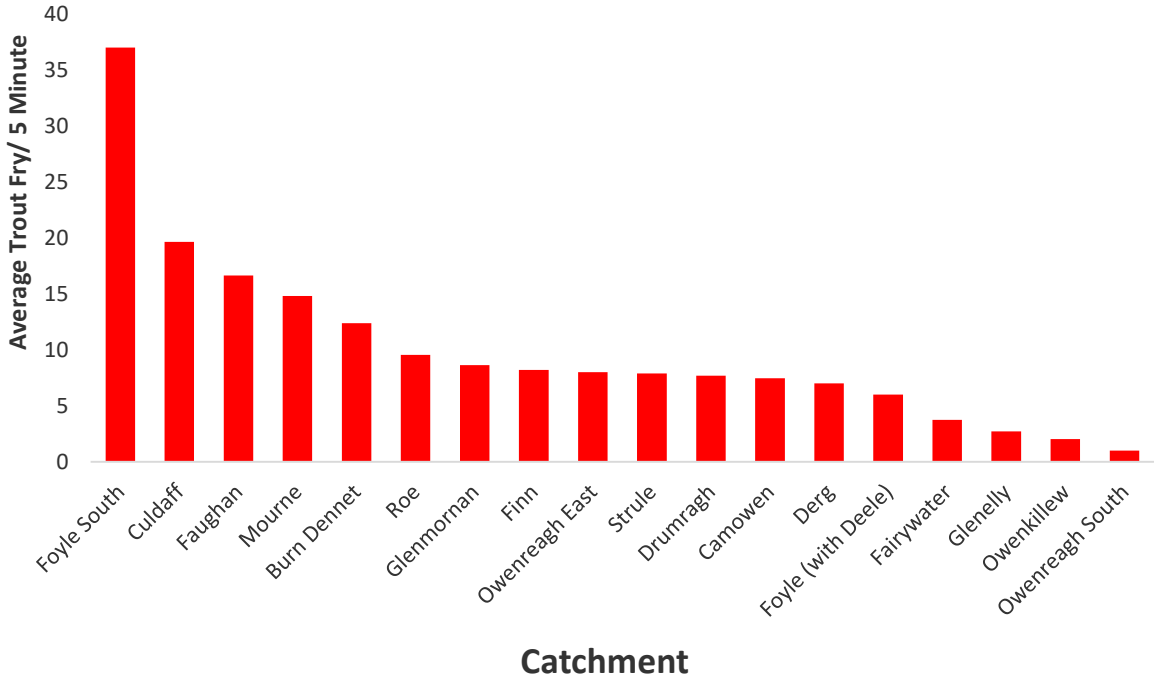


Fig.17 Foyle area Trout fry index comparison chart 2018.

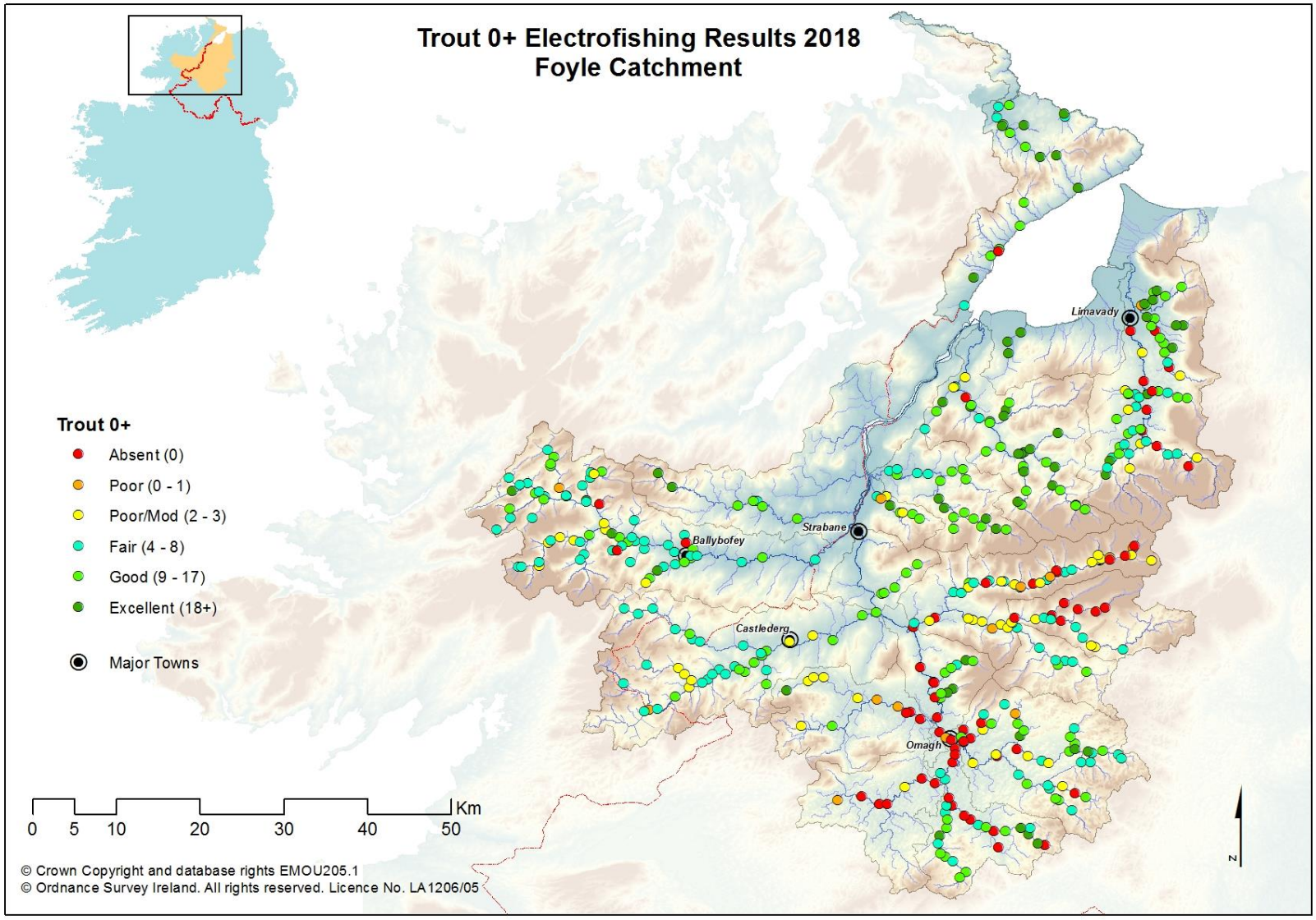


Fig.18 Foyle area trout fry electrofishing classifications 2018.

3.3 DISCUSSION

At present rod catch and juvenile electrofishing surveys are the two monitoring programmes conducted annually on Trout populations within the Foyle and Carlingford areas. Rod catch returns in 2018 were 13%, a slight improvement from 11% in 2017. It is a legal requirement for an angler to present the Loughs Agency with an accurate and timely rod catch return. Electrofishing surveys are carried out annually at approximately 500 sites across the Foyle and Carlingford areas. It should be noted that electrofishing data for juvenile trout cannot distinguish between what percentage of juveniles will go on to become Brown trout or Sea trout. In order to extend the baseline of available information, future expansion of the monitoring programmes could include the development of a Trout redd index on known trout spawning tributaries. This would facilitate the analysis of trends over time and the effects of any remedial works. A co-ordinated approach towards the management of our Trout stocks needs to be taken to ensure existing and future resources are managed in a sustainable manner. The development of collaborative partnerships such as the river enhancement schemes previously delivered in conjunction with the Wild Trout Trust has been shown to provide tangible benefits for improving, conserving and protecting trout stocks in the Foyle and Carlingford areas.

Fig.19 Sea trout captured during electrofishing survey on the Culdaff River, 2018

4.0 SUMMARY OF OTHER SURVEYS AND FISH STOCK ASSESSMENTS

- Nine Water Framework Directive fish surveillance monitoring stations were surveyed within the Foyle area in 2018. All nine stations were in Northern Ireland.

- Further details can be found in the 2018 WFD Fish Surveillance Report on the Loughs Agency website under the publications section www.loughs-agency.org

- A full Water Framework Directive compliant lake fish survey was carried out on Lough Mourne in September, 2018. The survey noted the presence of three fish species including Roach, Pike and European Eel. Although Roach were the most common fish encountered in the survey, Roach stocks have declined significantly since the last survey in 2010.

- In 2018 the Loughs Agency continued to meet its obligations under a raft of national and international legislation. In addition to meeting its statutory duties the Loughs Agency plans its monitoring works to best inform current and future policy development, and to deliver on conservation and protection targets as outlined in the Loughs Agency Corporate and Business Plans.

Additional Surveys and Fish Stock Assessments

Fish stock assessments are an extremely important part of fishery management. They provide the information on which to develop policy and to implement appropriate legislation and regulation to ensure future sustainable management.

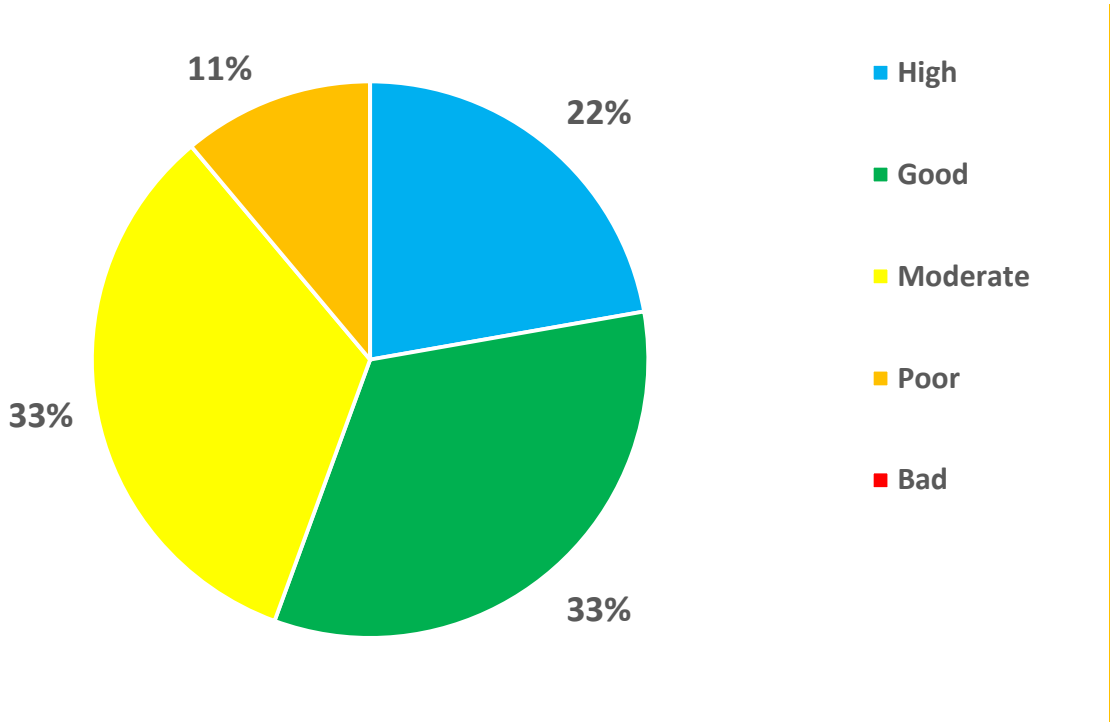
During 2018, nine stock assessments were conducted for Water Framework Directive fish monitoring purposes.

These sites were surveyed by quantitative electrofishing. This method involves stop netting of a section of river and conducting electrofishing removal sampling. The data generated can be used to calculate the densities of different species and age classes present. Other information is collected on site to derive fish classifications for incorporation into overall surface waterbody classification under the Water Framework Directive.

4.1 WATER FRAMEWORK DIRECTIVE FISH MONITORING

The Water Framework Directive is a key piece of European environmental legislation designed to facilitate improvements in our aquatic environments. The Loughs Agency under the guidance of the Northern Ireland WFD Fish Monitoring Group is responsible for fish monitoring within the Foyle and Carlingford areas. This involves the monitoring of 27 surveillance monitoring stations on a rolling three year basis. Quantitative electrofishing is the preferred method where possible and the data collected is used to derive a fish classification which is then combined with the results from other monitored parameters to create an overall surface water body classification. This ranges from High Ecological Status through Good Ecological Status, Moderate Ecological Status, Poor Ecological Status and Bad Ecological Status. The target set by the WFD is that all water bodies must reach Good Ecological Status by 2021. In 2018 the Loughs Agency monitored nine surveillance stations all of which fell within the Foyle area; none of the three WFD sites located in the Carlingford area were monitored in 2018. All nine Water Framework Directive fish surveillance monitoring stations surveyed within the Loughs Agency jurisdictions were within Northern Ireland. 22% of sites surveyed were classified as high status, 33% as good status, 33% as moderate status and 11% as poor status.

Fig.20 Water Framework Directive fish survey on the Dunnyboe Burn, 2018.



Classification in 2018 was completed using the WFD compliant classification tool, Fish Classification Scheme 2 Ireland (FCS2 Ireland) with the option of a professional judgement over ride. No results were over ridden using professional judgement in 2018. Additional indicative classifications have been derived for water bodies within the Foyle and Carlingford areas where certain criteria have been applied to semi quantitative electrofishing data. These criteria have been developed by the Northern Ireland Water Framework Directive Fish Group and are outlined within the annual Water Framework Directive report which is available under the publication section of the Loughs Agency website.

Fig.21 WFD fish monitoring on the Owenkillew, 2018.

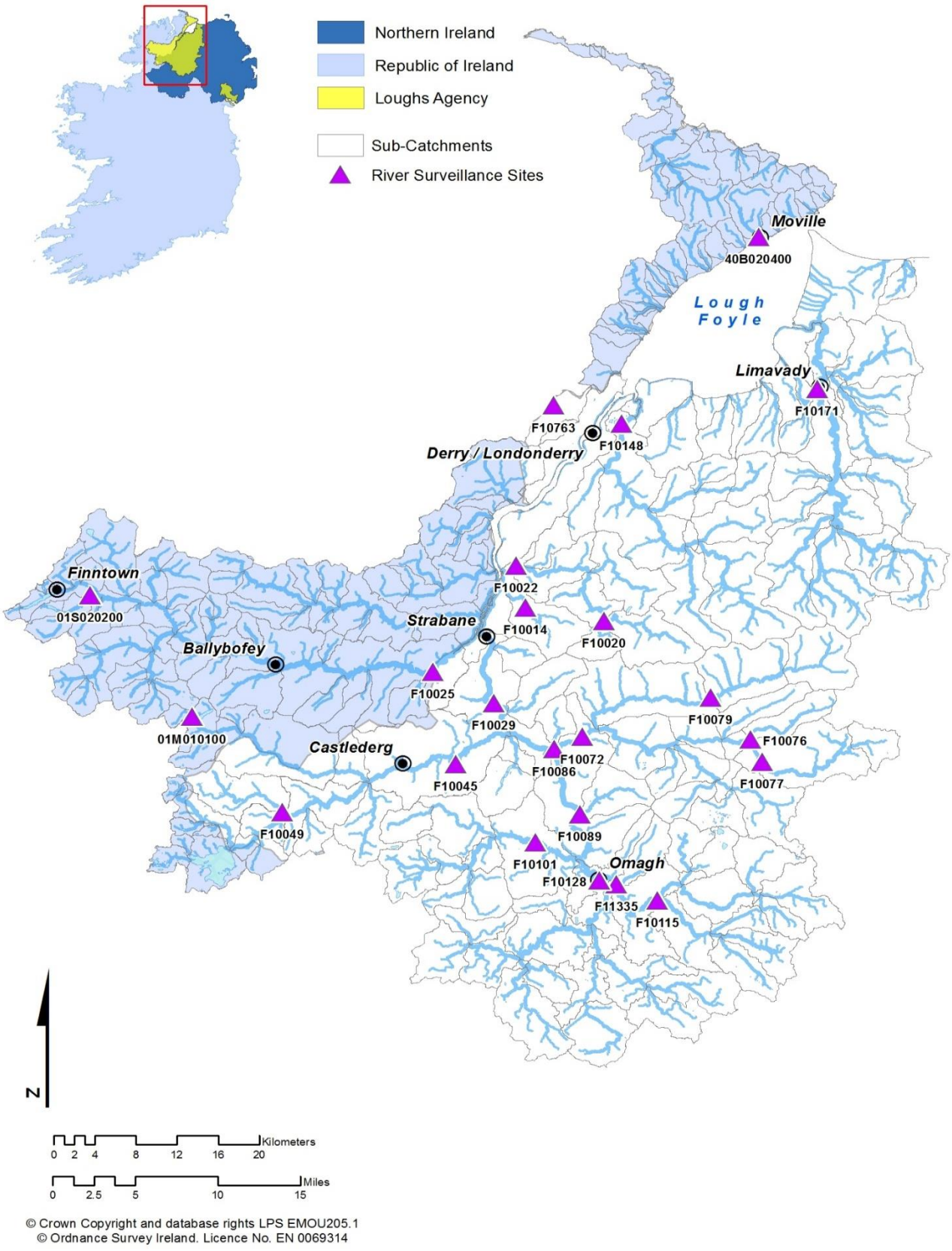


Fig.22 Water Framework Directive fish surveillance monitoring stations within the Foyle area.

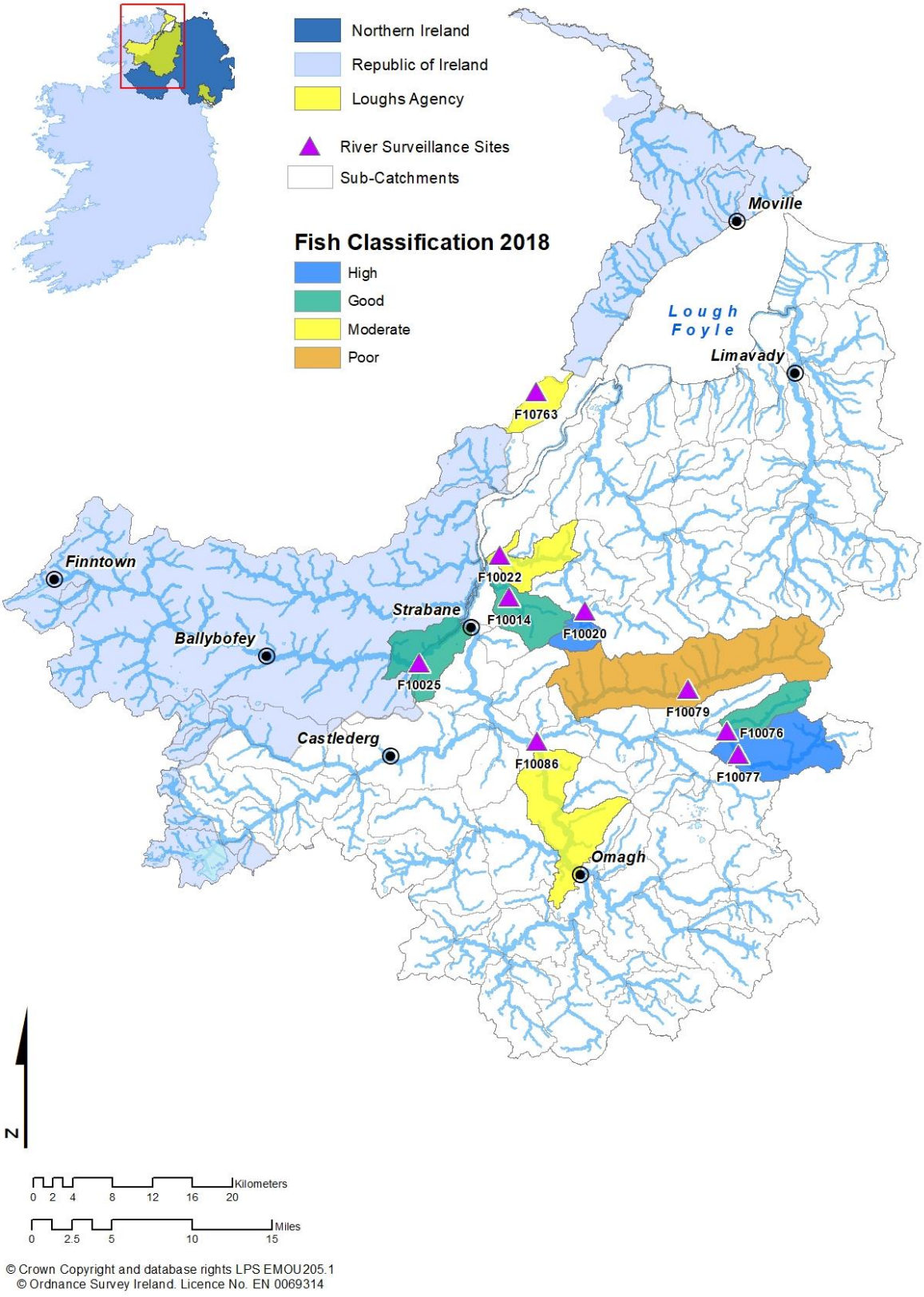


Fig.23 Loughs Agency WFD fish surveillance water body classifications 2018 Foyle area.

5.0 FOYLE SEA TROUT SURVEYS

The Loughs Agency monitors three index sites for returning adult Sea trout, the Altnaghree Burn, the River Mourne at Sion Mills and the River Finn. Monitoring commenced on the Altnaghree Burn in the autumn of 2011 after habitat improvement works had been undertaken on some stretches of the river in 2010. In the autumn of 2018 this index tributary was surveyed using standard electrofishing techniques. A total of 47 returning, pre spawning adult Sea trout were captured. Lengths, weights and scale samples were recorded for each individual fish for age analysis before they were released back into the river.

During the summer of 2018 a project continued to biologically validate the electronic fish counter on channel 1 of the River Mourne at Sion Mills through adult fish trapping. In 2018 a total of 16 adult Sea trout were captured and sampled for key biological information during periodic trapping in the months of June and July. Similar trapping carried out on the River Finn over the same period in 2018 resulted in a total of 13 adult Sea trout being captured sampled.

A key recommendation from this work is that additional adult Sea trout index sites are incorporated into the freshwater fisheries monitoring programme to provide key biological information for management purposes. The Loughs Agency is keen to develop a wider Foyle Sea Trout Partnership project in conjunction with local angling associations with the aim of monitoring the abundance and distribution of Foyle Sea trout stocks on a variety of tributaries.

Fig.24 Adult Sea trout captured and sampled for key biological information, Altnaghree Burn.

5.1 SEA TROUT STATUS REPORT

A Sea trout status report has been developed which provides an appraisal of available historical and contemporary information on Sea trout populations in the Loughs Agency areas. Potential management measures are proposed for this important natural resource with a view to conserving, protecting and improving Sea trout populations and their habitats. The report highlights threats to and declines of Sea trout stocks and the potentially significant under reporting of small Sea trout.

An assessment of Loughs Agency survey data suggests that it would be appropriate to recommend the setting of 'slot limits' when deciding the size and numbers of Sea trout which anglers are permitted to retain. This could be implemented through direct regulation by the Loughs Agency, a voluntary code of best practice or through angling association rules/permit conditions. Controlling the taking of Sea trout within clearly defined size limits could conserve and protect active breeders while maintaining the option for retaining a predetermined number of Sea trout. The concept of slot limits is a common fishery management tool used in other jurisdictions which can facilitate a more tailored approach to individual river/stock management. It is evidence based management in practice. The Sea trout Status Report can be accessed on the Loughs Agency website.

6.0 RIVER FAUGHAN ROTARY SCREW TRAP

The long term deployment of a Rotary Screw Trap (RST) continued on the River Faughan in 2018. The original rationale for carrying out trapping operations at the tidal barrage on the River Faughan had been to facilitate the coded wire tagging of Atlantic salmon smolts on their seaward migration. This tagging programme continued from 2002 to 2009. There was a break in the project in 2010 with the closure of the commercial mixed stock interceptory drift net fisheries which had been the main recapture method.

During the spring of 2014 the rotary screw trap was reinstated as part of the Loughs Agency Freshwater Fisheries Monitoring Programme. Since the initial inception of the project the scope has since expanded as a census of all fish caught, including all three lamprey species (Brook, River and Sea Lamprey). The trap tends to be deployed for approximately six to eight weeks during the

months of March to May each year to coincide with the smolt run. In 2018 there was a particular focus placed on the collection of key biological data for Sea trout. This included sub-sampling to collect lengths, weights and scale samples for age analysis at a later date. Enumeration of Atlantic salmon smolts also continues on annual basis at this monitoring station. The data collected helps to update and maintain the long term data set on the run timing and abundance of Salmon smolts on the River Faughan.

Fig.25 Rotary screw trap deployment at the tidal barrage on the River Faughan.

7.0 BATHYMETRY SURVEYS

Prior to conducting any WFD compliant lake fish surveys a full depth survey is carried out on the selected waterbody. The survey team requires a bathymetry map of the lake in order to calculate the lake size, the different depth zones and the deepest point of the lake. This information is essential to determine the appropriate numbers of net types and net locations consistent with the sampling procedures set out in the north/ south share fish in lakes protocol. Detailed transects of each lake is surveyed using Loughs Agency bathymetric equipment (integrated depth sounder and GPS) with depth and location data logged. This information was then extrapolated to create a detailed bathymetry chart for use during future full lake fish survey. Depth surveys were conducted in 2018 on two Gortin lakes; New Lough and Oak Lough (Fig.29) as well Lough Lee (Fig.30).

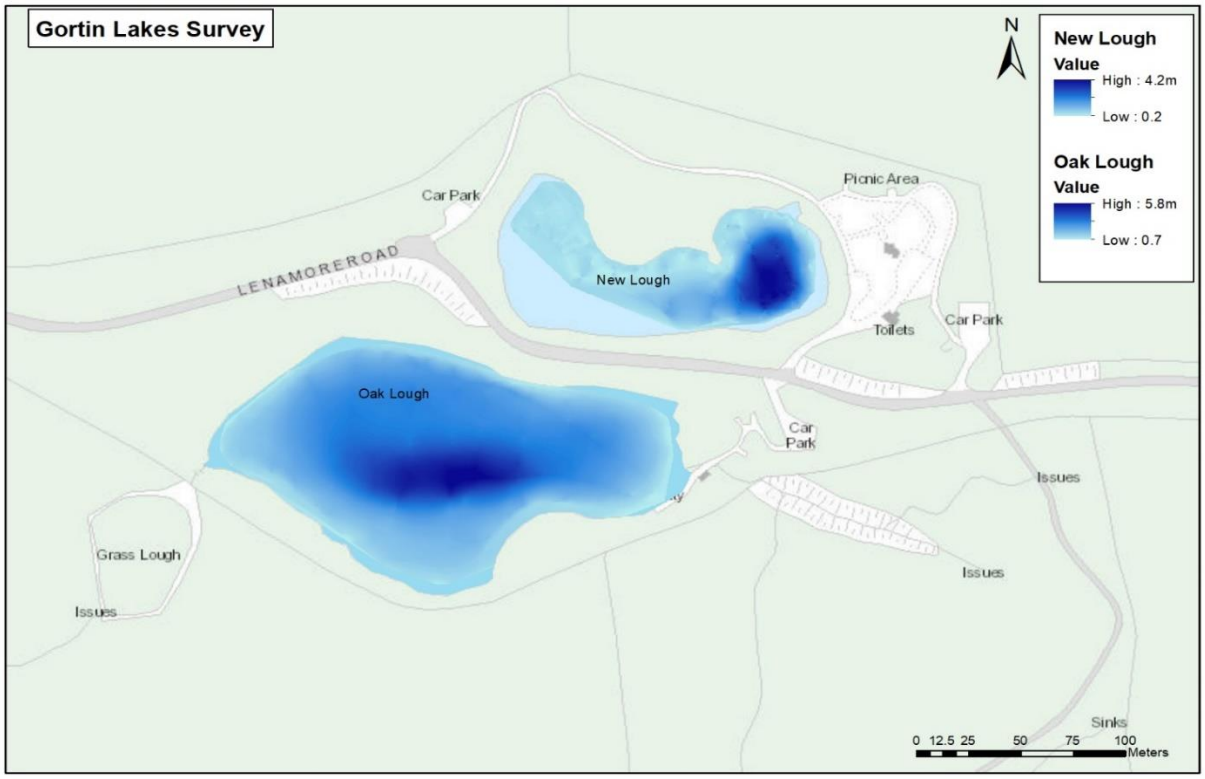


Fig.26 Bathymetry charts for the Gortin Lakes, New Lough and Oak Lough, 2018.

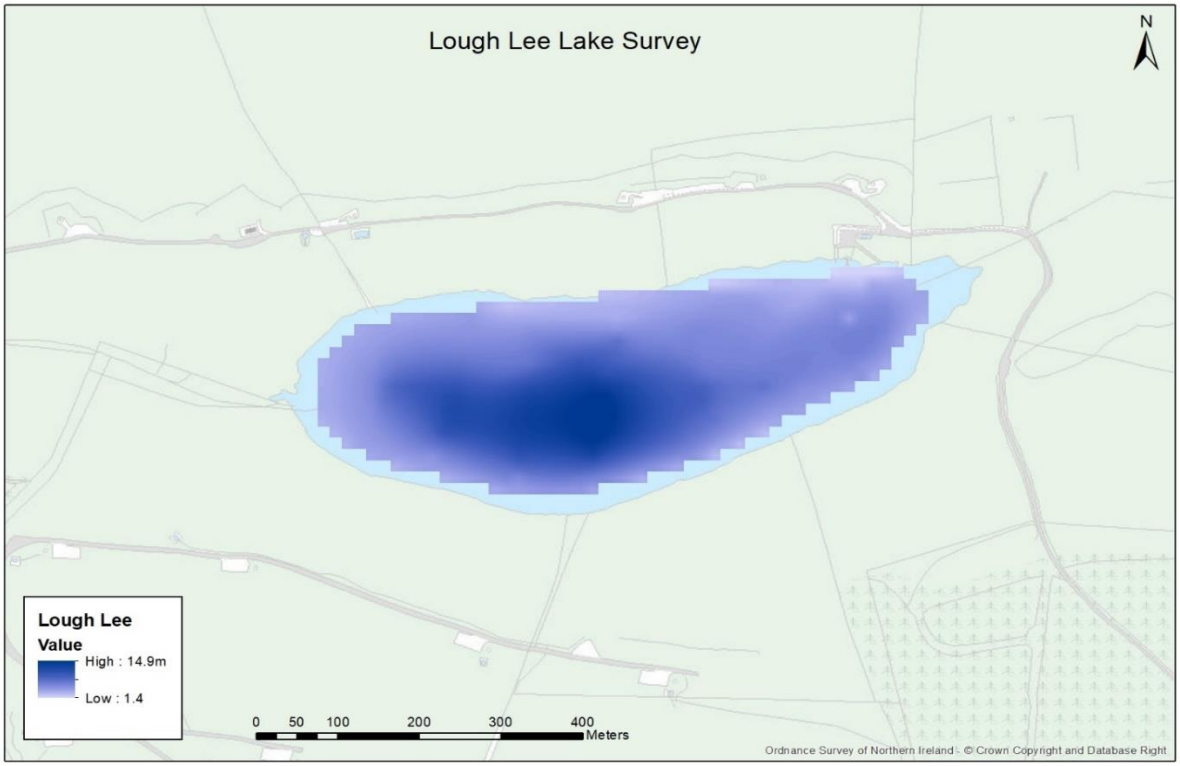


Fig.27 Bathymetry chart for Lough Lee, 2018.

Fig.28 Integrated depth sounder (GPS) deployed during bathymetry survey on New Lough.

8.0 LAKE FISH SURVEYS

A Water Framework Directive compliant still water fish stock assessment was carried out on Lough Mourne in September 2018. The Loughs Agency commenced a small rolling programme of lake fish surveys in 2010 to gain a better understanding of fish composition and abundance of the standing waterbodies within the Foyle and Carlingford areas. The 2018 fish stock assessment noted the presence of three fish species in Lough Mourne, including Roach, Pike and European Eel. Roach were the most common fish encountered in the survey. Roach stocks have declined significantly since the last survey in 2010, this may be due to the presence of the parasitic tapeworm *Ligula intestinalis* L. which was present in large numbers in many of the Roach that were sampled. Surprisingly there were no Brown trout were not recorded in Lough Mourne in 2018. This may indicate a problem the 'V' notch weir near the outflow of the lough into the Mournebeg River. The evidence suggests that the weir has created a barrier to fish migration resulting in habitat fragmentation. Ultimately as a consequence it would appear that Brown trout species have been extirpated from the lough.

Previous depth survey and net location maps (Fig.32) were used to determine net types and net locations. The full reports can be accessed through the publications section of the Loughs Agency website www.loughs-agency.org

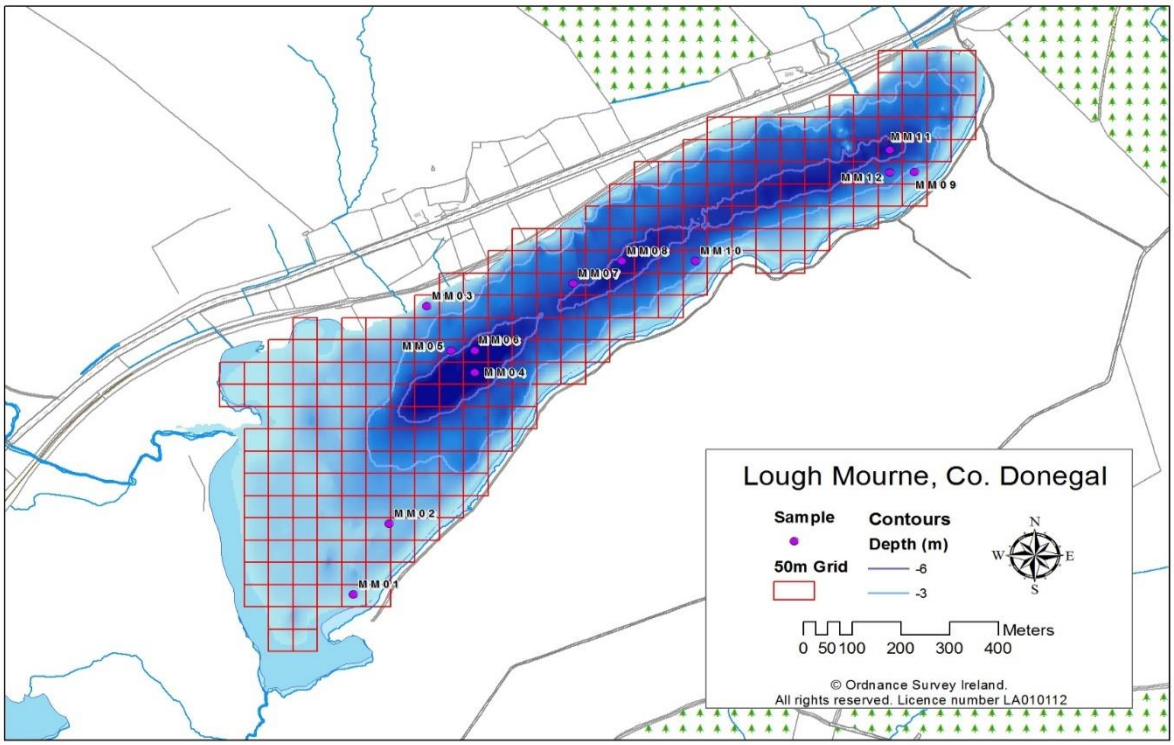


Fig.29 Bathymetry survey chart for Lough Mourne showing net type and locations.

The Loughs Agency follows the methodology developed for lake fish surveying under the Water Framework Directive. The method requires that a pre-determined number of benthic (bottom fishing) survey gillnets are set overnight within pre-selected depth zones. In addition a number of floating gill nets and fyke nets are also set. The key data collected can be used to derive common statistics to compare lake fish populations over time and to compare trends with other lakes across Ireland and Europe.

Fig.30 Lake fish survey at Lough Mourne Co. Donegal, 2018.

9.0 EUROPEAN SMELT SURVEYS

During March and April 2018 a number of surveys targeting European smelt were conducted within the Foyle catchment. The aim was to collect contemporary information on the temporal and spatial distribution of Smelt (*Osmerus eperlanus* L.) on the River Mourne at Strabane. Fyke nets were deployed in multiple locations over a series nights to assess the presence and location of a spawning population Smelt. Key biological data including lengths, weights, scale samples, stomach content analysis and gill raker counts were recoded for all Smelt captured. The 2018 Smelt survey was carried out on the basis of a 2017 recommendation that subsequent surveys should be undertaken on the River Mourne to ascertain the upstream limit of the species.

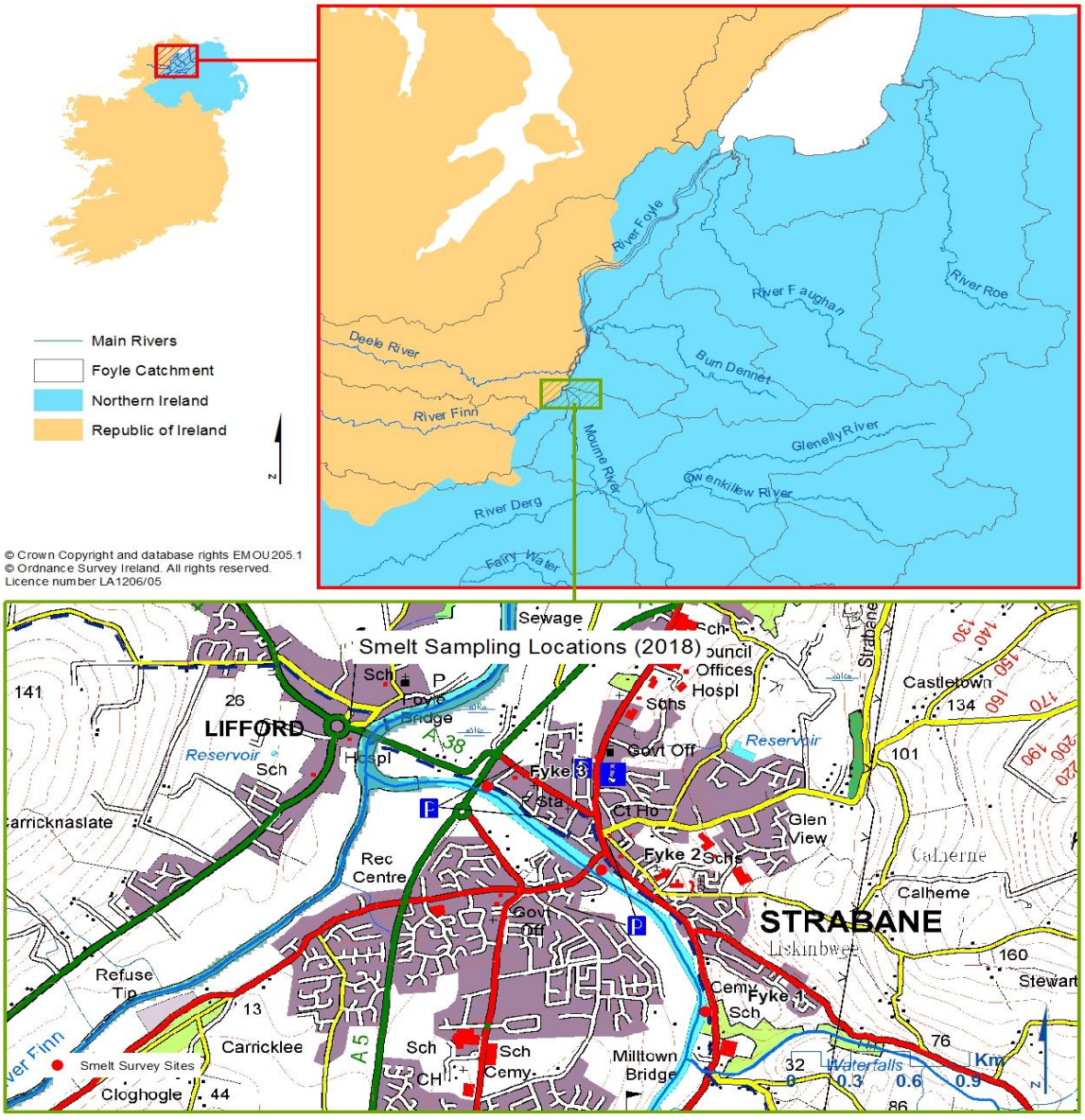


Fig.31 Netting locations for the European smelt survey on the River Mourne, 2018.

Fig.32 European smelt captured during survey on the River Mourne, 2018.

10.0 RIVER MOURNE AND RIVER FINN FISH TRAPPING

Biological validation of the electronic fish counter on the River Mourne channel 1 was conducted from June to August 2018 at Sion Mills. Trapping operations have been ongoing on an annual basis since 2016 when the initial validation exercise to confirm the veracity of fish counts for the River Mourne commenced. The River Mourne electronic fish counting facility near Sion Mills has two counting channels. Channel 1 consists of a Denil fish pass running inland bypassing Sion Mills weir and which can be regulated by a modern sluice gate at the upstream end. The electronic fish counter is located within this channel. Immediately upstream of the electronic fish counter a mobile trap is installed periodically so that a detailed biological validation exercise can be undertaken to ascertain the accuracy of the electronic fish counter. The trapping operations are resource intensive and the project generates a significant volume of data both from the electronic fish counts and the key biological information collected during trapping periods. Sampling windows are randomly selected with all fish being measured, weighed and having scale samples taken. Similar trapping operations are also carried out simultaneously at a second statutory fish counter site at Killygordon on the River Finn. The Loughs Agency operates a real time management regime for both the commercial and recreational Atlantic salmon fisheries within its jurisdiction. These projects provide critical oversight of the Loughs Agency Fish Counter Programme and the overall management of Atlantic salmon stocks in the Foyle and Carlingford areas.

Fig.33 Atlantic salmon captured on the River Mourne, 2018.

Fig.34 Trapping facilities on the fish counter site at Killygordon on the River Finn, 2018.

11.0 RIVER MOURNE AND STRULE HIB's SURVEY

In 2018 the **H**abitats impacts, **I**nvasive species and **B**arriers to migration survey was completed within the River Mourne and Strule catchments. The initial project began in 2008 with the Faughan, in total 7 catchments have been have been surveyed since then. The 2018 surveys covered both the River Mourne (Green) and the River Strule (Blue). The HIB's project combines 3 surveys in one to assess potential negative factors on riparian systems. The survey information is recorded on a handheld data logger with integrated GPS. This information is stored within the Loughs Agency GIS. The survey has been designed to collect information which will facilitate the development of habitat improvement or river enhancement projects.

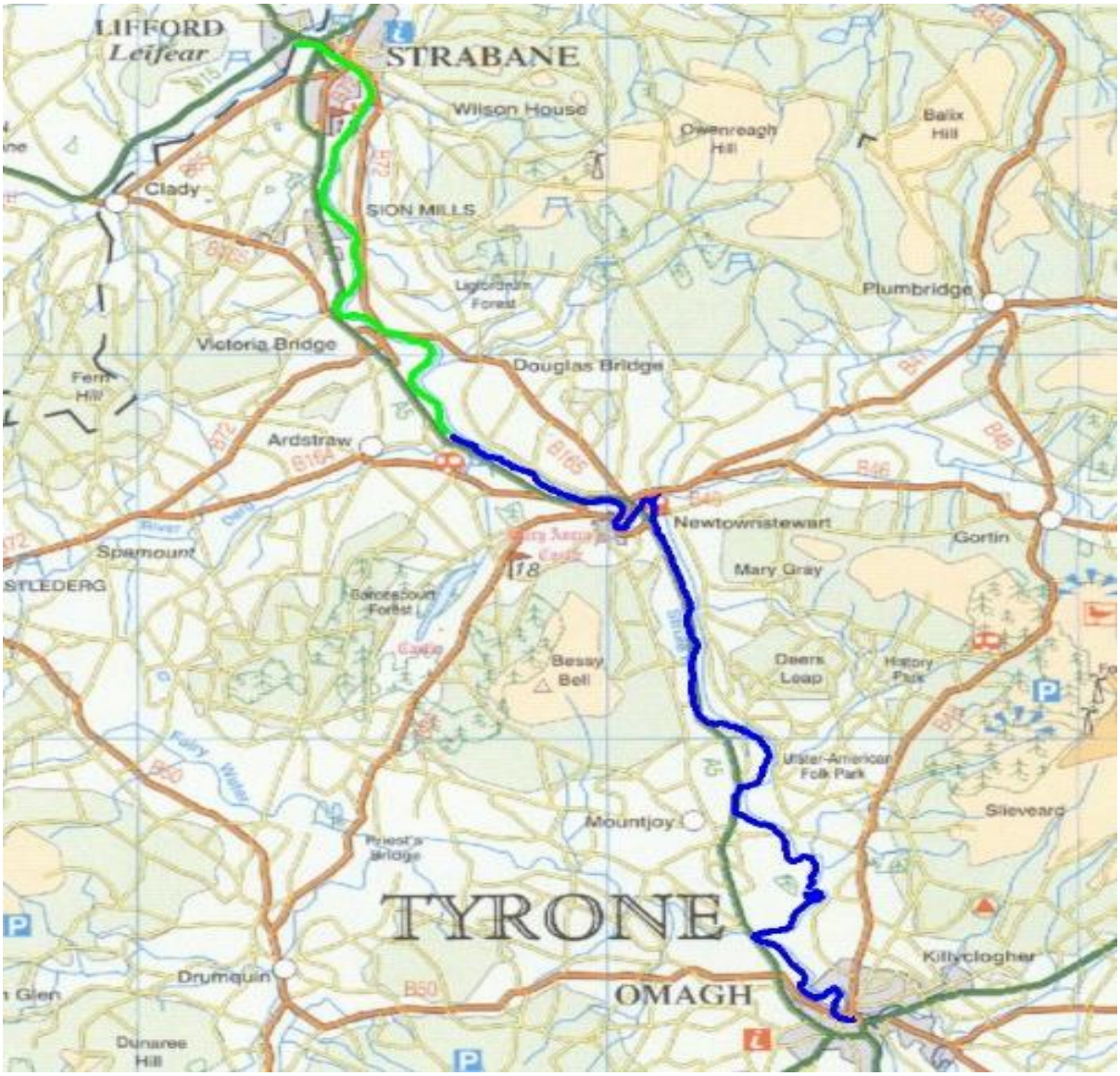


Fig.35 HIB's surveys on Rivers Strule and Mourne, 2018.

Fig.36 Giant Hogweed at the confluence of the Rivers Mourne and Finn, 2018.

Fig.37 Himalayan Balsam on the River Strule, 2018.

12.0 CATCHMENT INITIATIVES

Catchment management can be delivered through the development of collaborative partnerships between statutory and non-statutory partners. Environmental legislation such as the Water Framework Directive coupled with national legislation remains the key driver towards integrated management of our freshwater environments. The Loughs Agency continues to meet its statutory obligations under the directive and provides the evidence base for management of the aquatic resources of the Foyle and Carlingford areas.

The scope of the Freshwater Fisheries Monitoring Programme continues to expand year on year as the number and diversity of the projects increase. It may become necessary in the future to mobilise and make use of enthusiasts and volunteers as a support base for delivering catchment initiatives aimed at restoring our freshwater systems. This practice has been referred to as 'Citizen Science' and these types of initiatives usually attract people from angling clubs and non-governmental organisations which have a vested interest in the biodiversity of our rivers and streams.

In 2019 and beyond the Loughs Agency will continue to engage local stakeholders in participating in a wide variety of actions designed to develop and implement aquatic and riparian conservation and protection projects. This may include the development of habitat improvement / river enhancement works or collaborative programmes to monitor water quality or aquatic invertebrates.

If you are a member of an organisation which may be interested in working on collaborative conservation and protection projects within the Foyle please contact mark.mccauley@loughs-agency.org to discuss potential projects.

13.0 GENERAL ACTIONS FOR 2018/2019

- Continue to develop and implement the Loughs Agency Freshwater Fisheries Monitoring Programme.

- Facilitate the implementation of habitat improvement projects including buffer zone creation, riparian fencing schemes, native tree planting and in-stream habitat improvements/ river enhancements.

- Continue and develop River Faughan Rotary Screw Trapping index site for Atlantic salmon and Sea trout smolts.

- Continue to develop and implement biological validation on the River Mourne at Sion Mills and the River Finn at Killygordon to collect key biological information on Atlantic salmon and Sea trout stocks.

- Create a Sea Trout Partnership for the Foyle and Carlingford catchments with the aim of conserving, protecting, developing and improving Sea trout stocks.

- Work with interested statutory and non-statutory partners to improve water quality, aquatic invertebrates and native fish populations.

- Communicate the findings of monitoring projects to Loughs Agency staff, board members and stakeholders through various media.