



Carlingford Area and Tributaries Catchment Status Report 2016

Conservation and assessment of fish
populations and aquatic habitats

Art Niven & Mark McCauley

August 2017



Conservation actions and assessments of fish populations and aquatic habitats are presented for 2016. 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

2016 was another successful year for the Loughs Agency freshwater fisheries monitoring programme. Invaluable data was collected to inform management decision making across various project areas. This information has an internal audience for management purposes and a growing audience from a wide variety of external stakeholders.

This catchment status report aims to provide a timely synopsis of the key findings from across the range of Loughs Agency monitoring projects. The information may inform stakeholder decision making and it is hoped this information exchange can facilitate a growing awareness of the significant natural resources and assets that rely on healthy aquatic habitats within the Foyle and Carlingford areas.

The key long term data sets collected as part of the “audit point management system” for Atlantic salmon continue to be presented here and include rod catch, returning adult salmon fish counts derived from electronic fish counters, electrofishing surveys on juvenile Atlantic salmon and spawning counts.

Additional information reported on for 2016 includes the first record of the invasive non native species *Corbicula fluminea* (Asian clam) from the tidal River Foyle. Other key information collected during 2016 includes baseline information from a number of lake fish surveys, Water Framework Directive fish classifications, European smelt (a fish species of conservation interest) distribution and abundance, an expanded adult Sea trout monitoring project, adult Atlantic salmon monitoring, multi species monitoring on the River Faughan index site and habitat impacts, invasive species and barriers to fish migration monitoring.

The Loughs Agency continues to disseminate project findings across various media from traditional print, social media including Twitter, Facebook and YouTube and through direct presentations to interested stakeholders.

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2.0 ATLANTIC SALMON STOCKS SUMMARY

- There are no net fisheries for salmon in the Carlingford area in addition there were no net fisheries pursued for Atlantic salmon in the Foyle area in 2016. 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 in 2016 for the Foyle and Carlingford area was 2664. Total declared rod catch for the Carlingford catchments was 20. Voluntary catch and release for the Foyle and Carlingford areas was 51% and 20% for the Whitewater River.
- Fish counts derived from an electronic fish counter on the Newry River was 926 fish in 2016.
- Juvenile electrofishing surveys within the Carlingford catchments at 49 sites recorded an average of 2 salmon fry (Young of Year). Within the Whitewater catchment at 13 sites there was an average of 2 salmon fry.

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

There are no salmon net fisheries within the Carlingford area. 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.

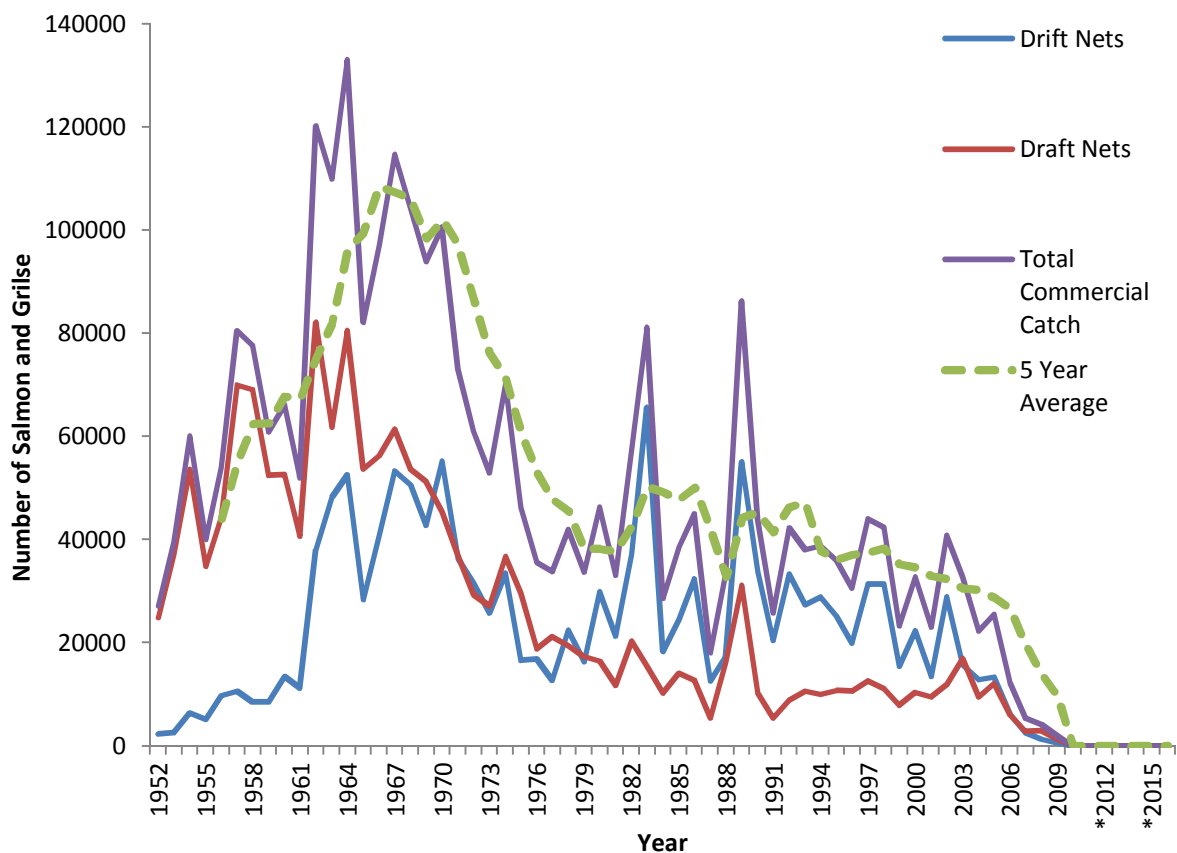


Fig.1 Atlantic Salmon total commercial catch 1952-2016 and 5 year average total commercial catch. * Denotes no commercial fisheries conducted since 2009

2.2 ROD CATCH

Total rod catch returns were 46% in 2016 (Figure 2). A total of 2644 salmon/grilse were caught in the Foyle and Carlingford areas in 2016 (Figure 2 & 3). 20 salmon and grilse were reported caught in the Carlingford catchments (Figure 4). Salmon/Grilse voluntarily caught and released were 51% in the Foyle and Carlingford area and 20% on the Whitewater.

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.

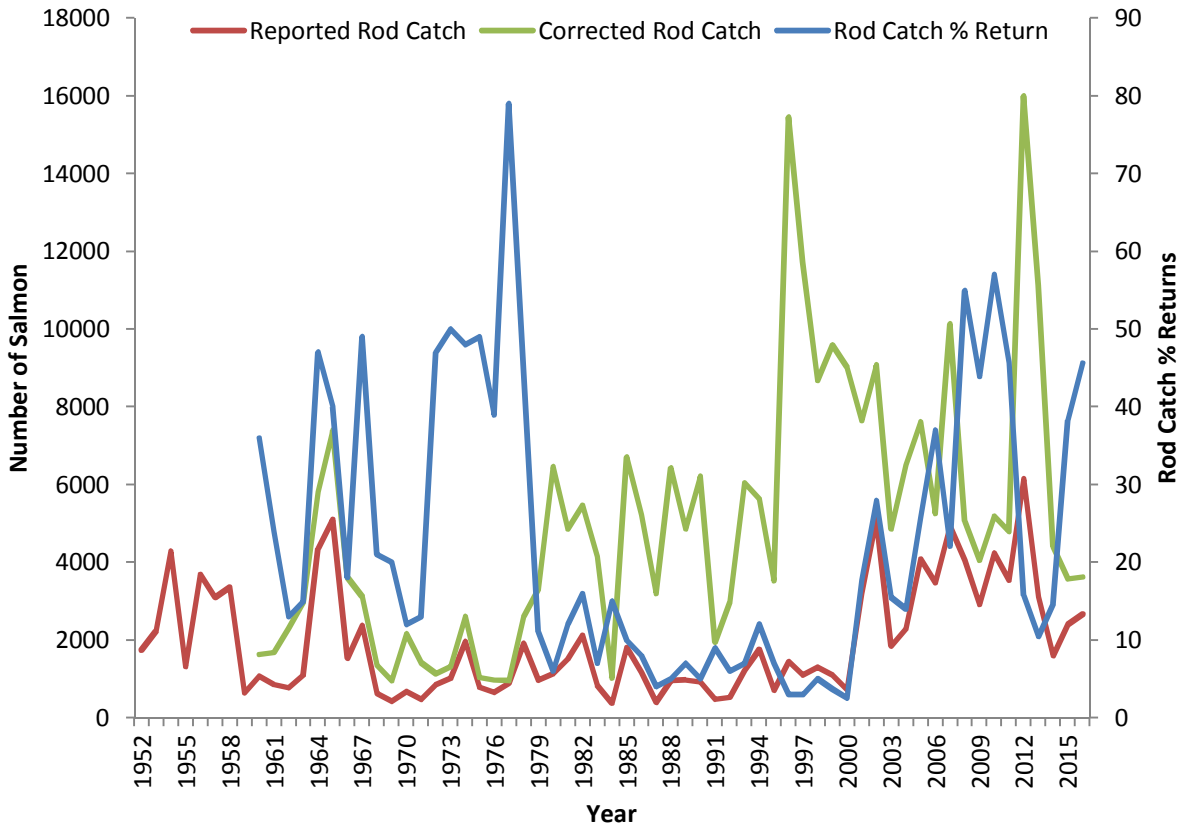


Fig.2 Loughs Agency reported and corrected rod catch with % returns made.

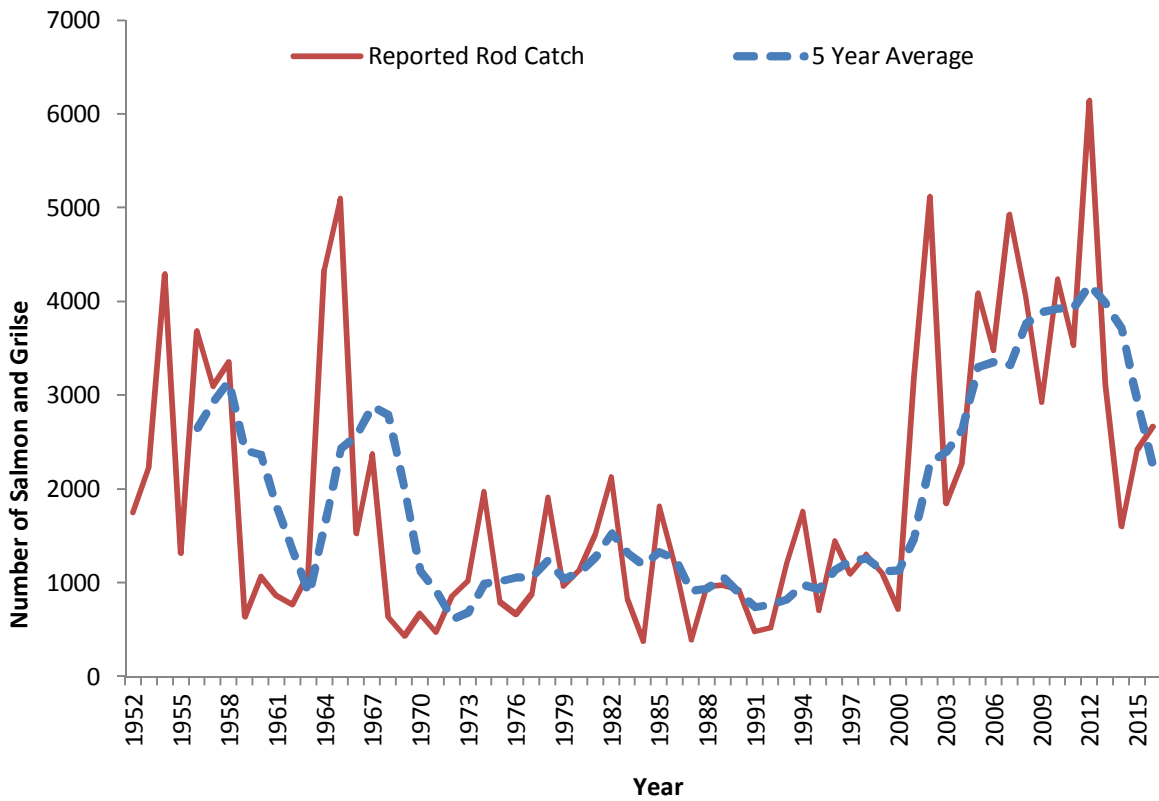


Fig.3 Reported rod catch for salmon/grilse in the Loughs Agency area and 5 year average.

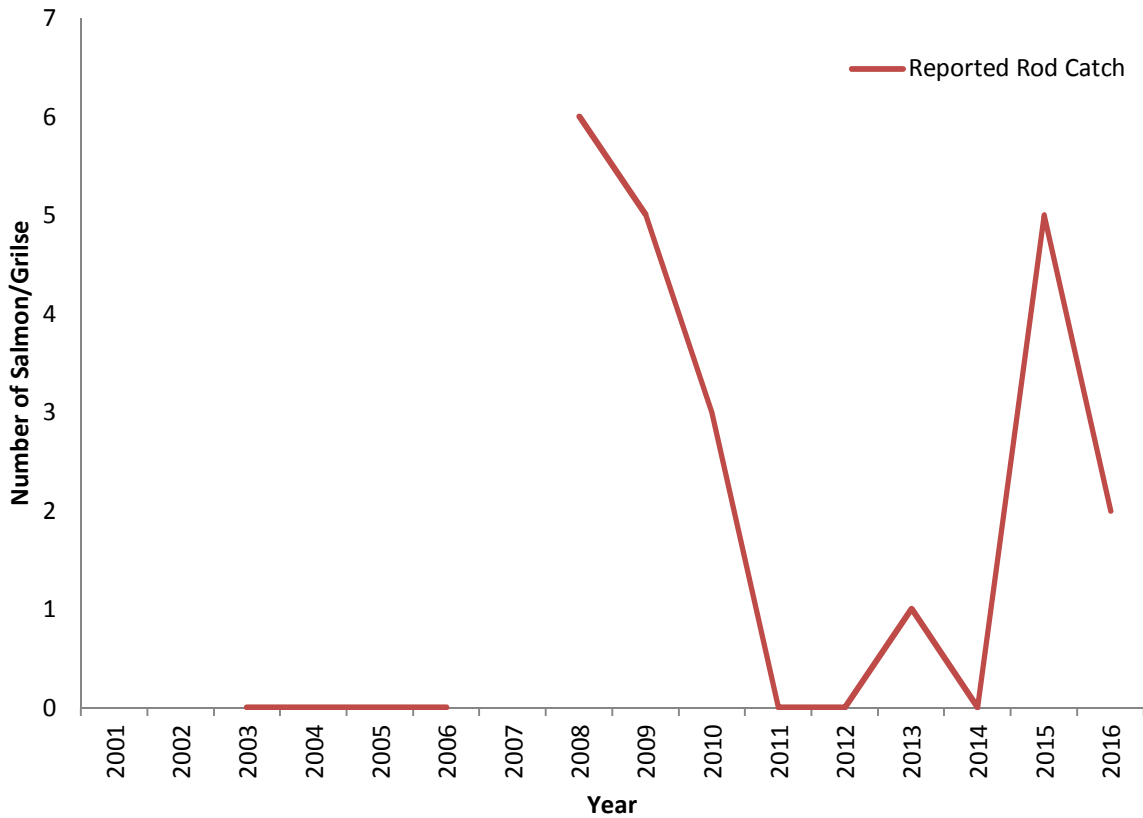


Fig.4 Newry/Clanrye River reported rod catch 2001-2016.

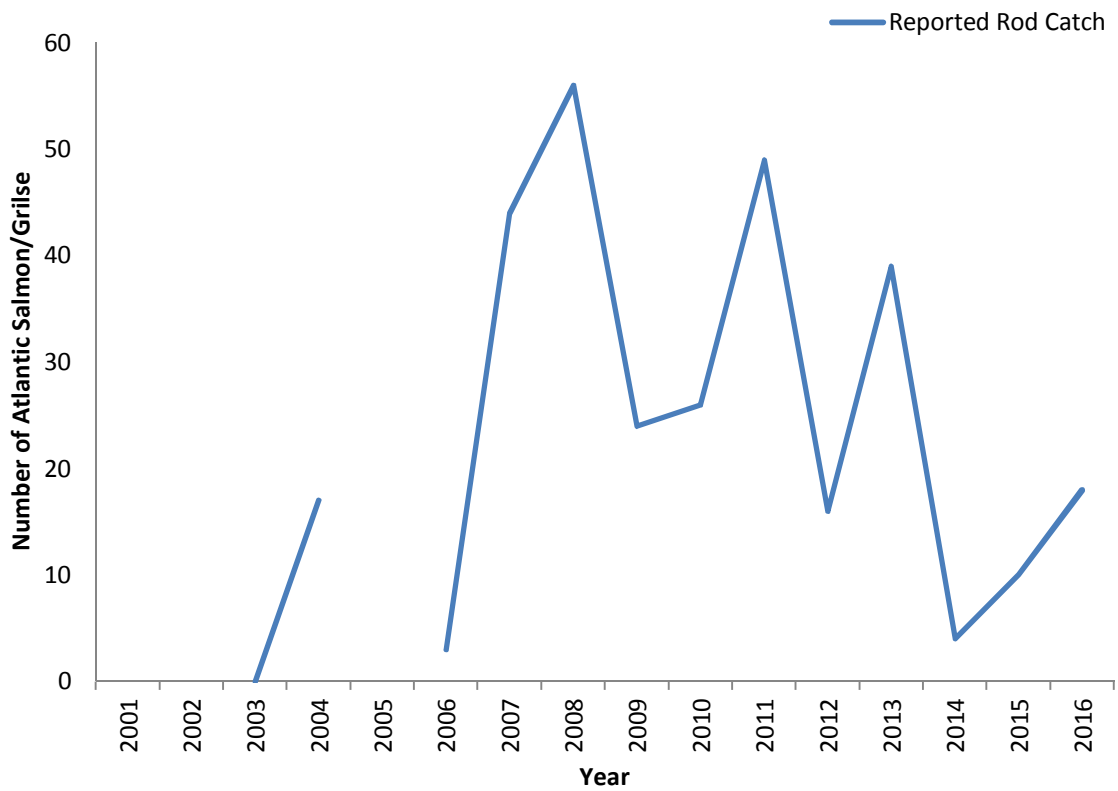


Fig.5 Whitewater River reported rod catch 2001-2016.

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 2016 the Newry fish count as recorded by the electronic fish counter was 926.



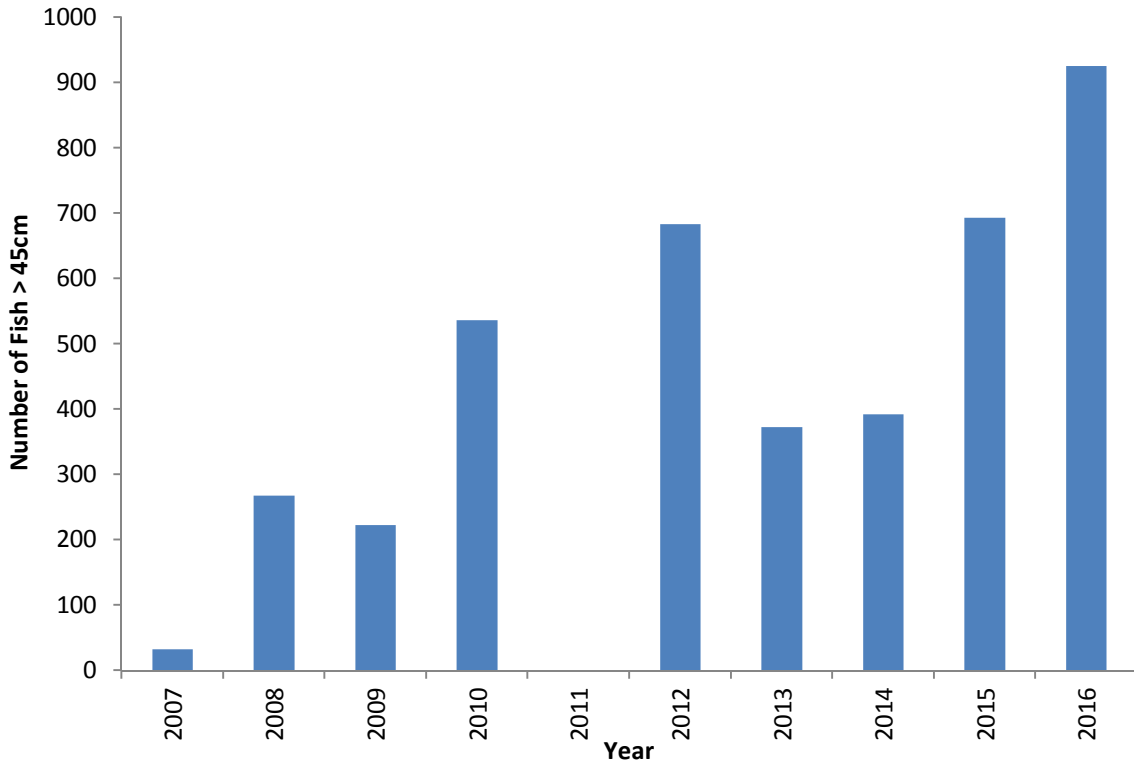


Fig.6 Newry River electronic fish counter figures 2007 to 2016 *Note partial count only recorded for 2007 from September to end of year. Counter was not operational during 2011.

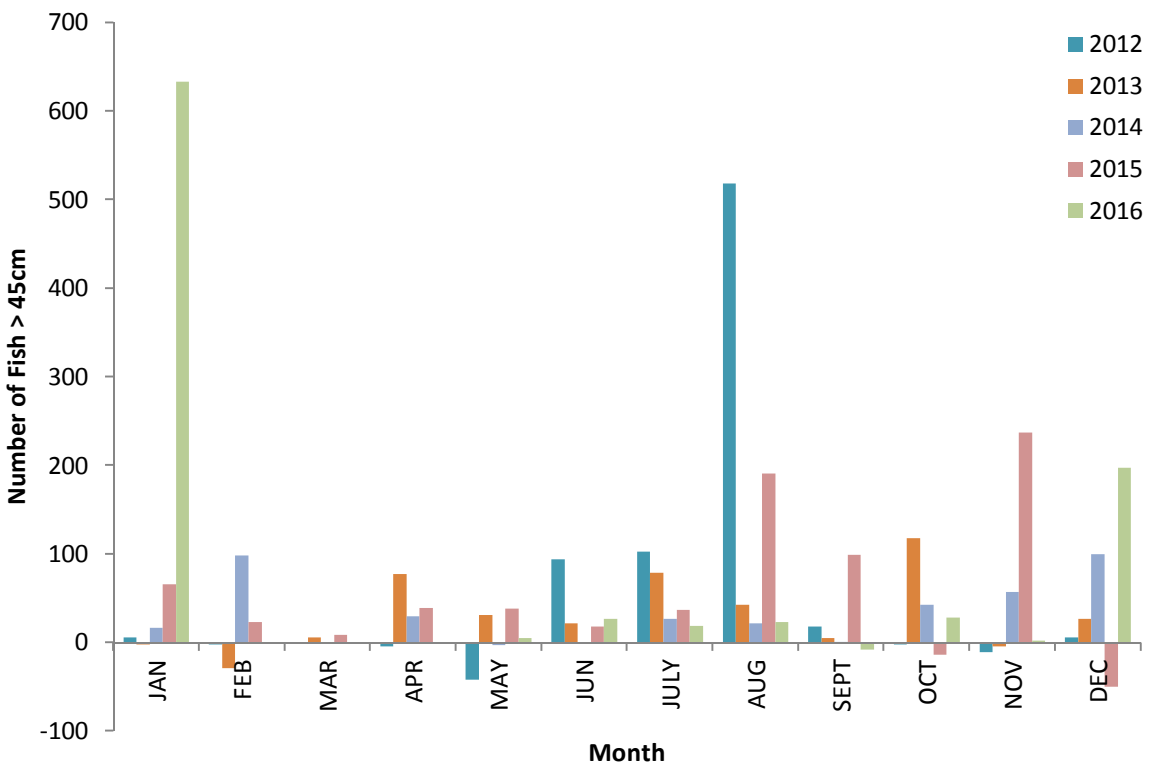


Fig.7 Newry River fish counter figures 2010-2016. *Counter was not operational in 2011.

2.4 JUVENILE ABUNDANCE/ELECTROFISHING SURVEYS

Juvenile Atlantic salmon abundance is measured on an annual basis by following a standardised procedure (Crozier and Kennedy, 1996). A number of 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 (Figures 8 & 9). In 2015 the mean number of salmon fry (young of year) recorded at 26 monitoring stations within the Newry/Clanrye catchment was 1. The mean number of salmon fry recorded at 6 monitoring stations on the Whitewater River was 2.

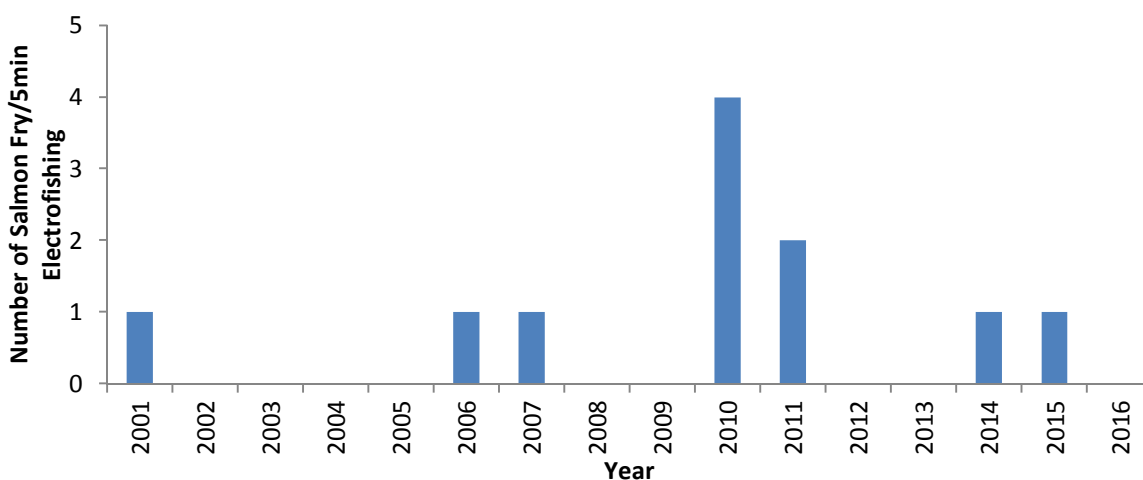


Fig.8 Newry River/Clanrye salmon fry electrofishing index. Based on a fluctuating number of sites

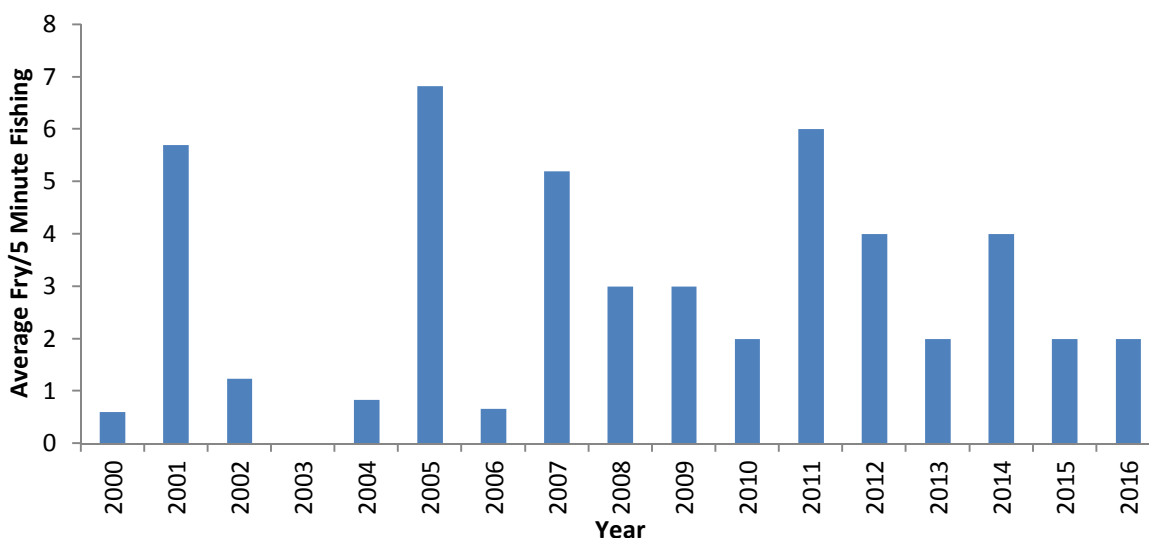


Fig.9 Whitewater River salmon fry electrofishing index. Based on a fluctuating number of sites.

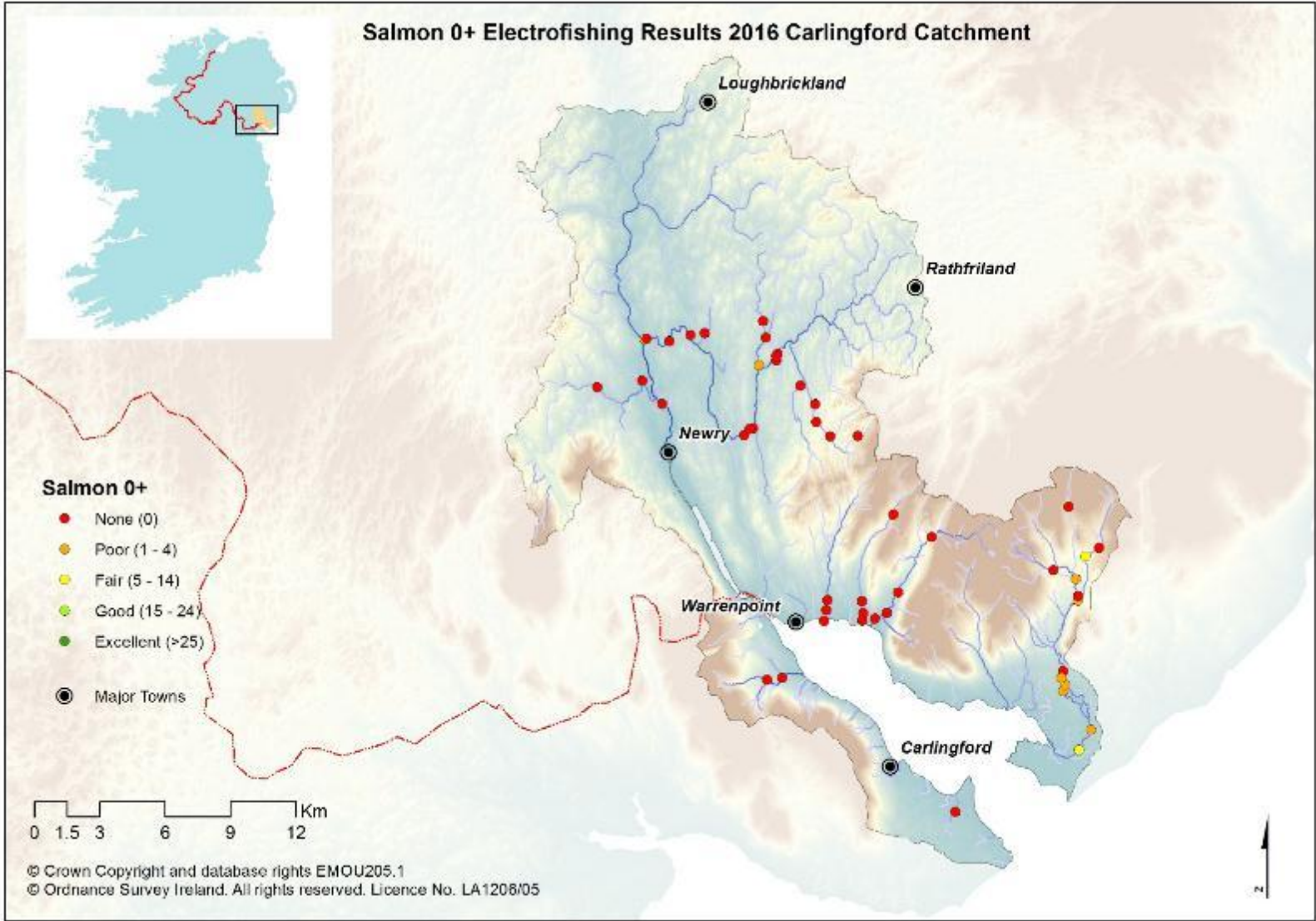


Fig.10 Carlingford salmon fry electrofishing classification 2016.

2.5 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 6.66% has been calculated for the 2015 cohort returning to the river in 2016. This is an increase from the 2.9% marine survival rate recorded for the 2014 cohort, but still well below historic highs. Multi Sea Winter (MSW) Atlantic salmon appear to be doing slightly better.

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.

2.6 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, 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 2016 total declared Sea trout rod catch for the Foyle and Carlingford areas was 450. Total declared rod catch for the Carlingford catchments was 74. There was 54 Brown trout declared caught in 2016.
- In 2016 juvenile electrofishing surveys within the Clanrye/Newry catchment at 20 sites recorded an average of 3 trout fry. Within the Whitewater catchment at 13 sites, an average of 6 trout were recorded.
- Declines in sea trout stocks have been observed in parts of Ireland and the west coast of Scotland. Diverse reasons for population declines have been proposed and are currently being investigated.
- The Loughs Agency will continue to conduct monitoring as part of various trout research projects in 2017 which will monitor local sea trout.

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 2016 the sea trout monitoring programme on a tributary of the Burdennet was expanded to include the Culdaff River and adult trapping on the River Mourne. 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 11-14 outline Sea trout rod catch for the Foyle and Carlingford areas and for the Clanrye/Newry catchment and Whitewater catchment. This area may be locally significant for Sea trout spawning and as such would merit closer investigation.

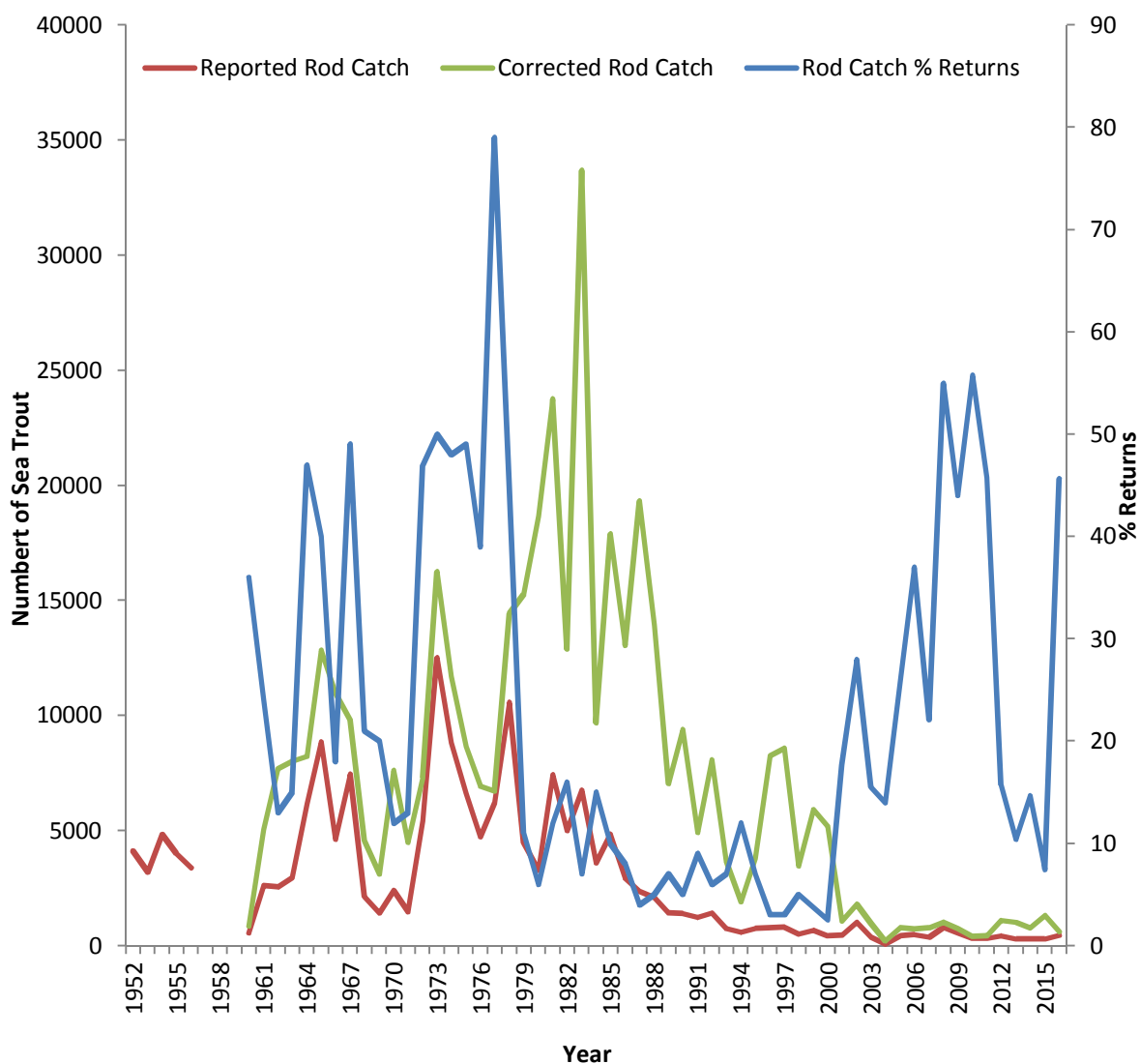


Fig.11 Loughs Agency reported and corrected rod catch (Sea trout) with % returns made.

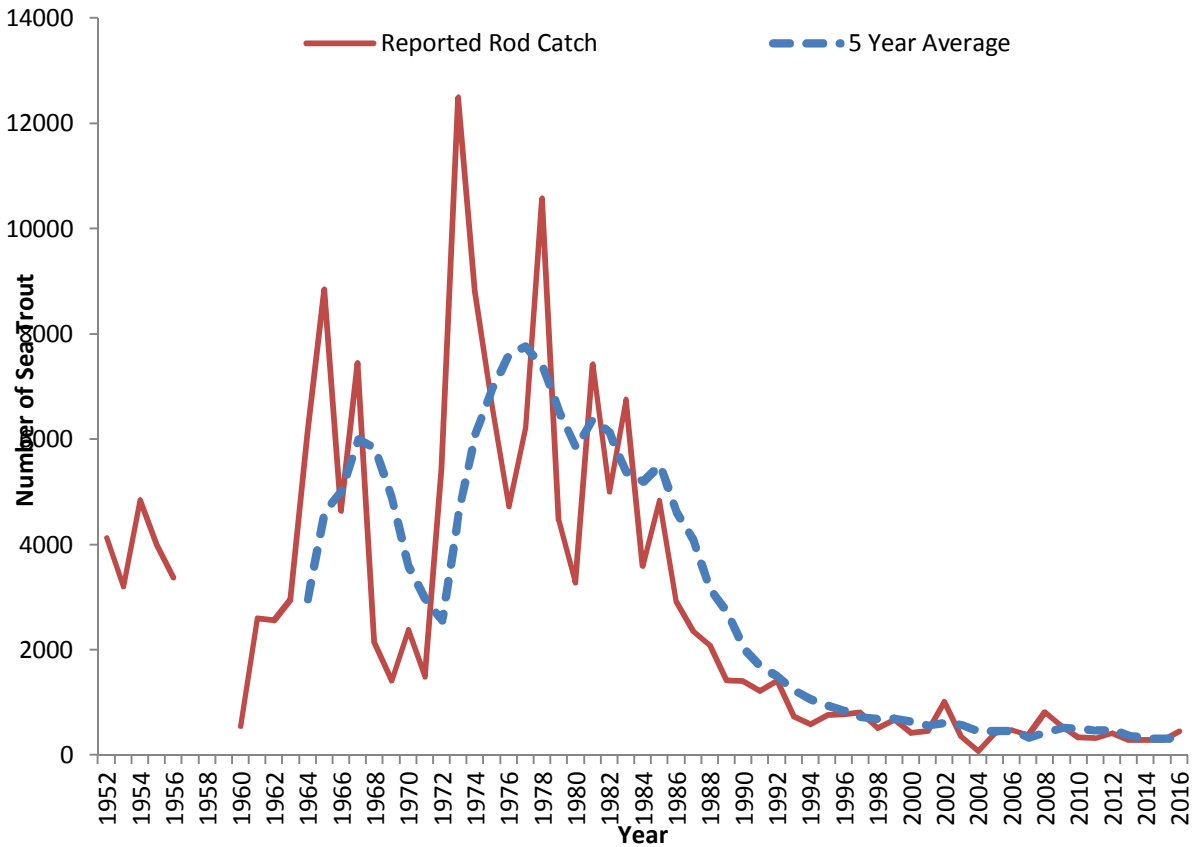


Fig.12 Reported rod catch for Sea trout in the Loughs Agency area and 5 year average.

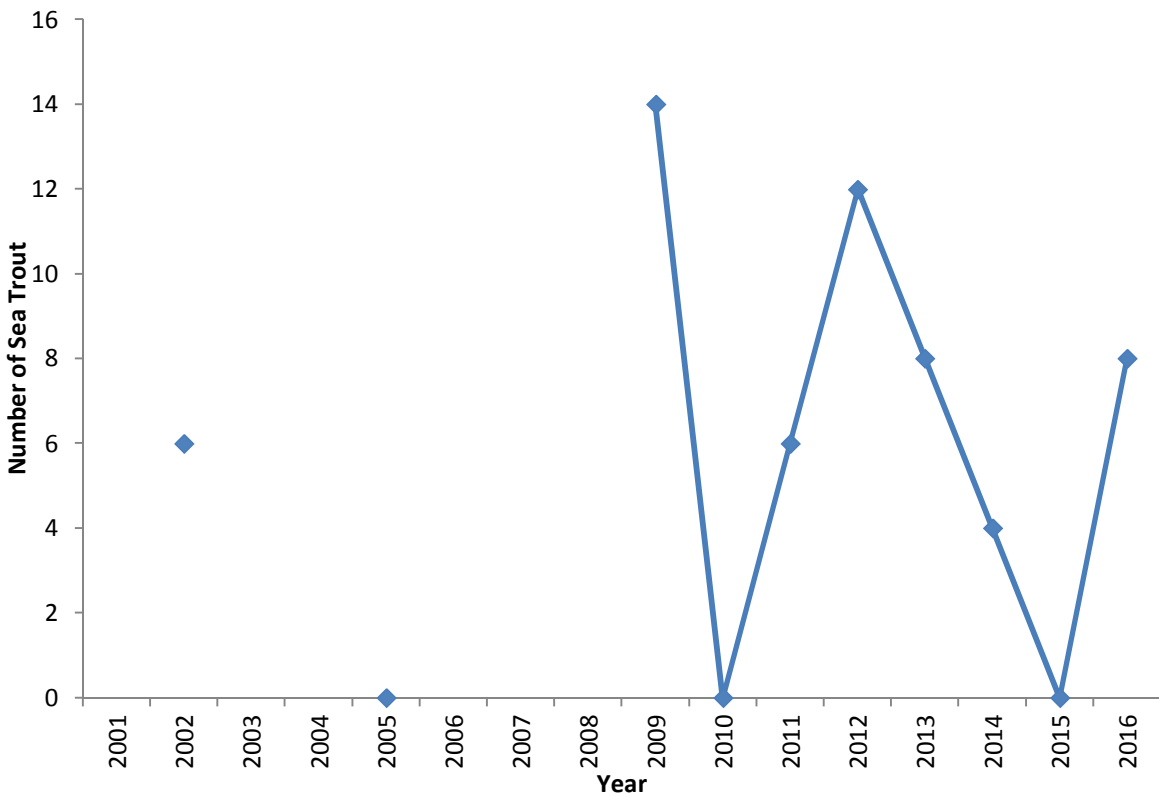


Fig.13 Newry/Clanrye catchment reported Sea trout rod catch.

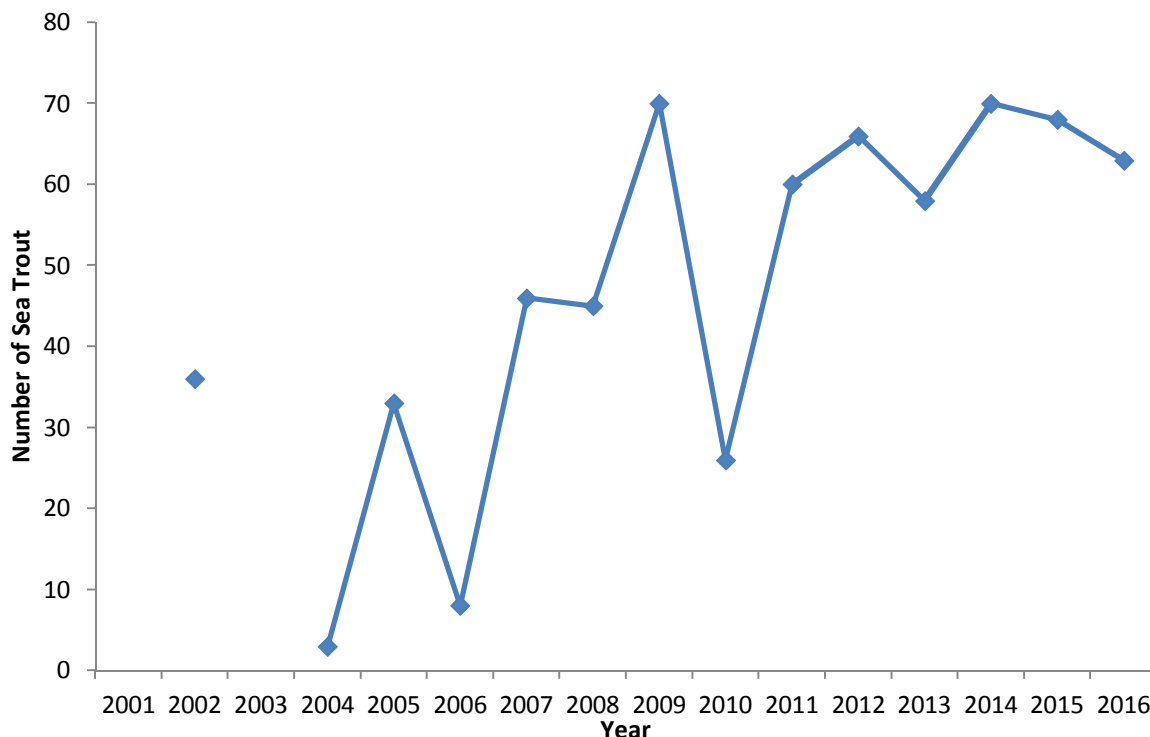


Fig.14 Whitewater catchment reported Sea trout rod catch.

3.2 JUVENILE ABUNDANCE/ELECTROFISHING SURVEYS

As for juvenile Atlantic salmon, Trout abundance is also measured on an annual basis by following the same standardised procedure (Crozier and Kennedy, 1996). A number of 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 15). In 2016 the mean number of trout fry (young of year) recorded at 20 monitoring stations within the Newry/Clanrye catchment was 3. The mean number of trout fry recorded at 13 monitoring stations within the Whitewater catchment was 6.



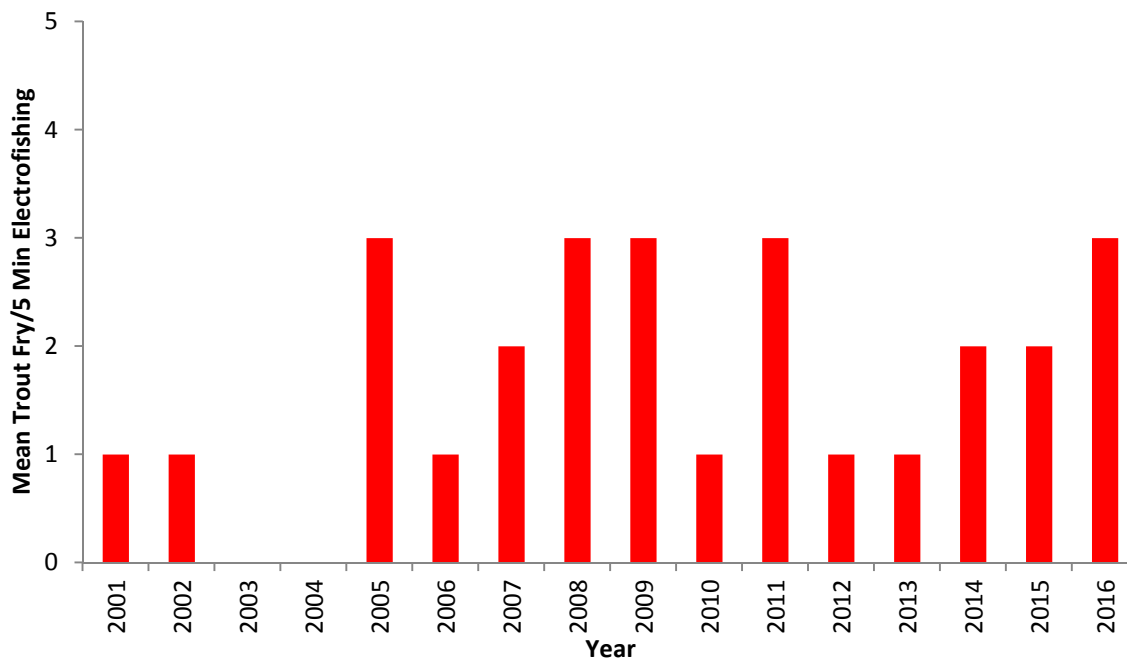


Fig.15 Newry/Clanrye trout fry index 2001-2016. Based on a fluctuating number of sites.

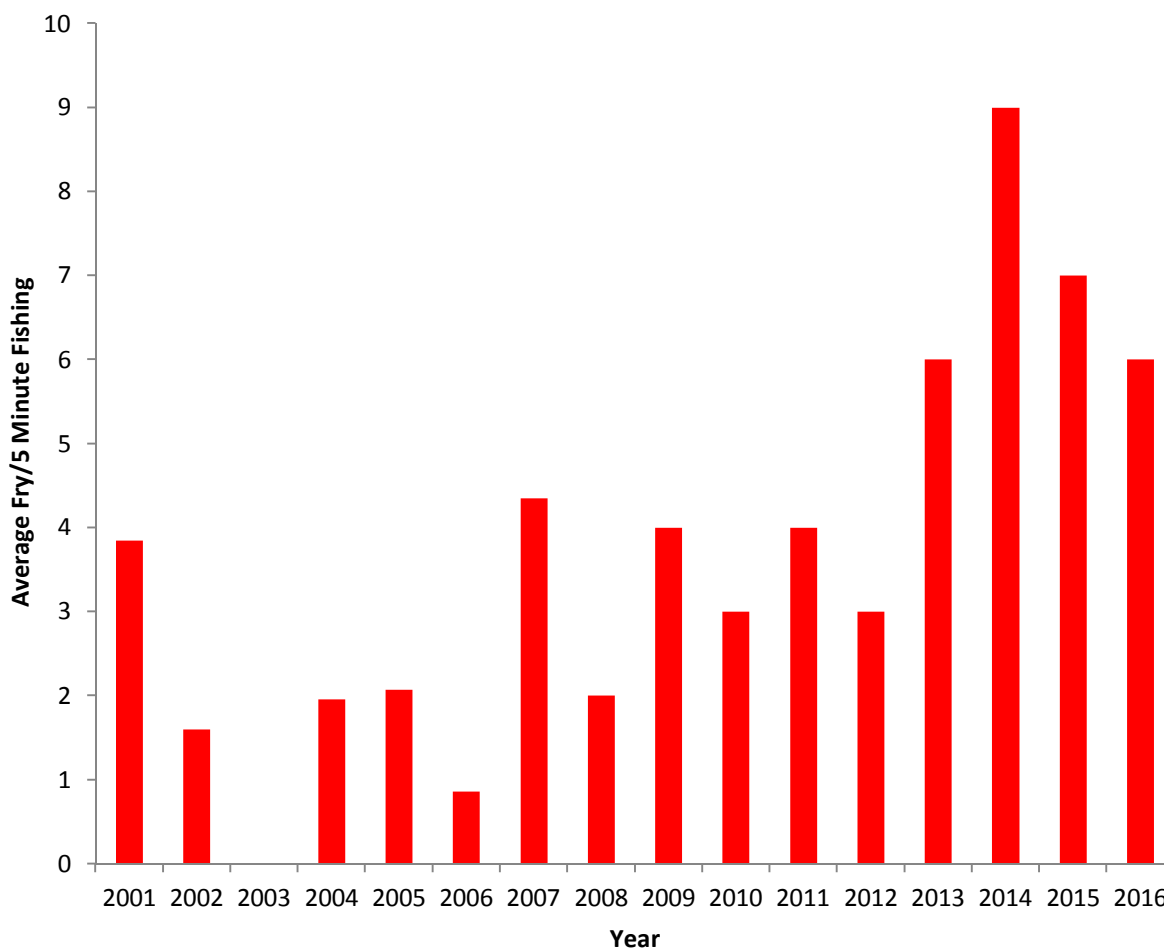


Fig.16 Whitewater trout fry index 2001-2016. Based on a fluctuating number of sites

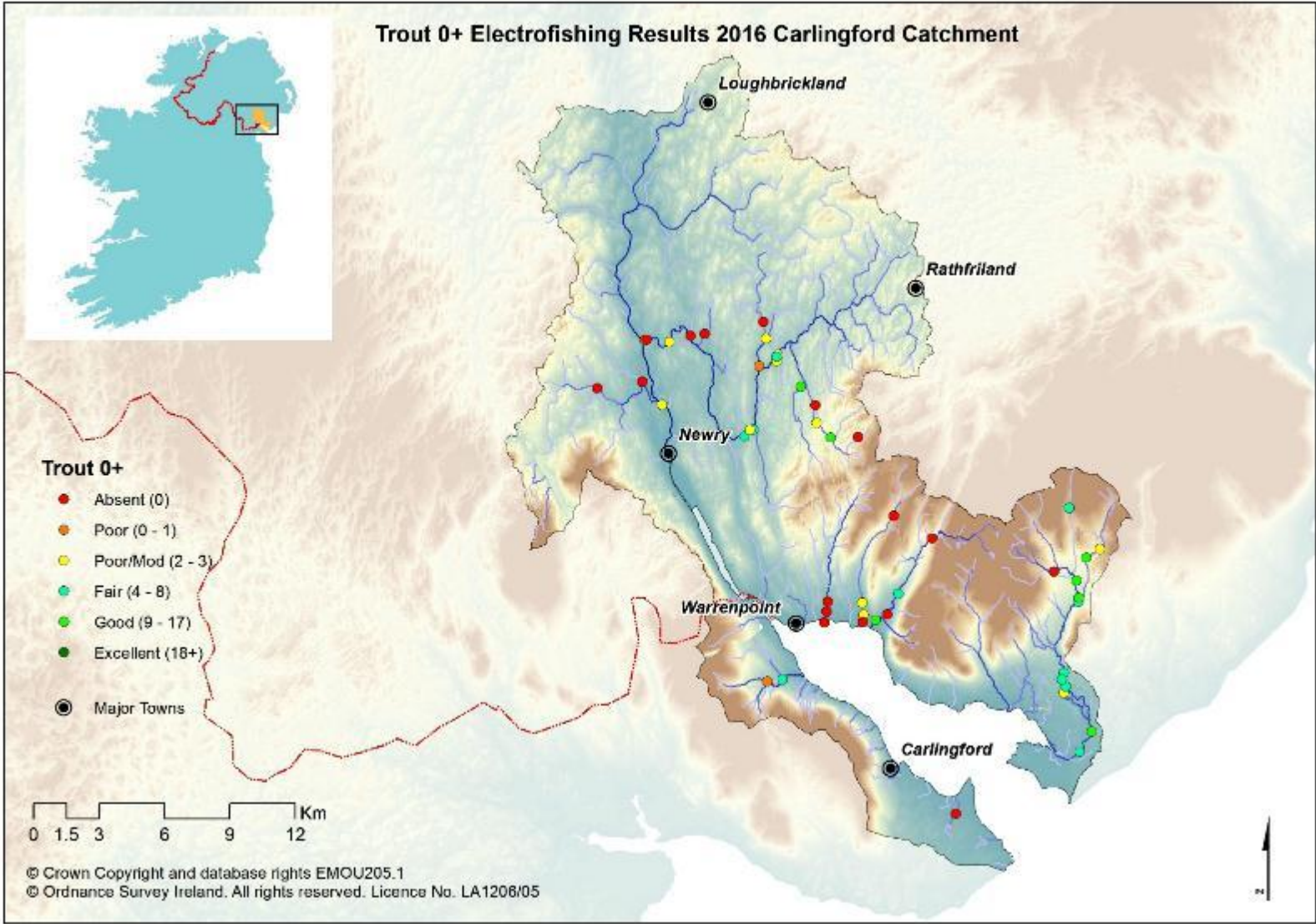


Fig.17 Carlingford area trout fry electrofishing classifications 2016.

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. In order to extend the baseline of information future expansion of the monitoring programmes could include the development of a Trout redd index on key tributaries. This would facilitate the analysis of trends over time and the effects of any remedial works. Adult Sea trout electrofishing surveys could also be conducted to gain key biological information which could assist with regulating catch size. The Carlingford catchments are significant habitats for Sea trout. Within the Carlingford area there is competition with Atlantic salmon for feeding territories. While both species have slightly different habitat requirements at times they do overlap. The general trend is that salmon dominate the main stem and swifter water while trout dominate the smaller tributaries.

Ongoing monitoring is essential for the development of appropriate and contemporary regulation of the rod fishery.



Fig.18 Trout captured on the Newry River, 2016.

4.0 SUMMARY OF OTHER SURVEYS AND FISH STOCK ASSESSMENTS

- Nine Water Framework Directive fish surveillance monitoring stations were surveyed in 2016. Two of these surveys were carried out within the Carlingford area.
- Further details can be found in the 2016 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 Camlough in 2016. This was the first survey of this type conducted on Camlough and has provided a baseline of information from which to base future management.
- A method for validating the Newry River electronic fish counter was tested in 2016 and involved setting a wing net immediately upstream of the counter. The net was successfully deployed.
- In 2016 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.

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 2016, 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.

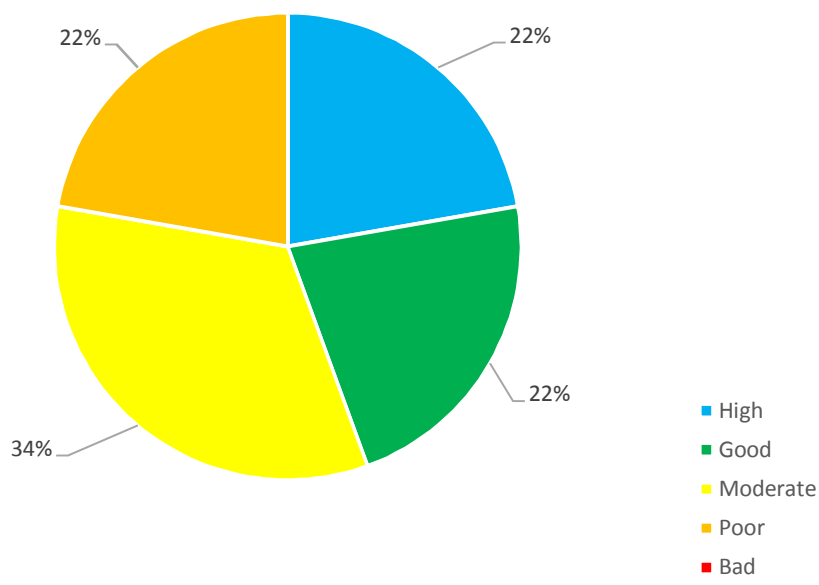
4.1 WATER FRAMEWORK DIRECTIVE FISH MONITORING

The WFD 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 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 2016 the Loughs Agency monitored nine surveillance stations including two in the Carlingford area.

Of the nine Water Framework Directive fish surveillance monitoring stations surveyed within the Loughs Agency jurisdictions in 2016 six were within Northern Ireland and three in Ireland. 22% of sites surveyed were classified as high status, 22% as good status, 33% as moderate status, 22% of sites were classified as poor and 0% as bad status.



Fig.19 Brown trout from the Newry River, 2016.



Classification in 2016 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 2016. Additional indicative classifications have been derived for water bodies within the Foyle and Carlingford areas where certain criteria have been applied to semi quantitative Salmon Management Plan 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 available under the publication section of the Loughs Agency website.



Fig.20 Atlantic salmon parr from the Newry River, 2016.

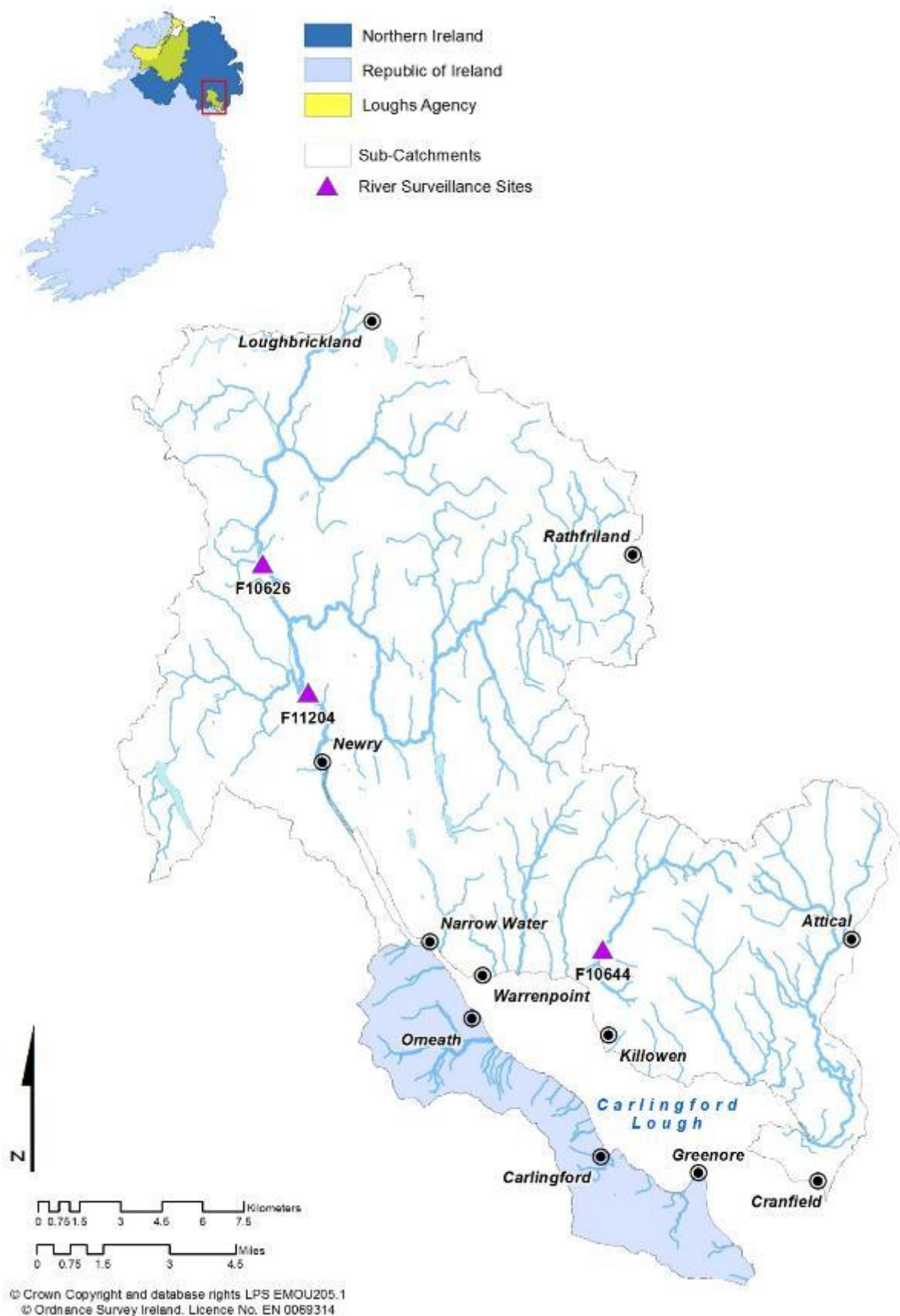


Fig.21 Water Framework Directive fish surveillance monitoring stations within the Carlingford area.

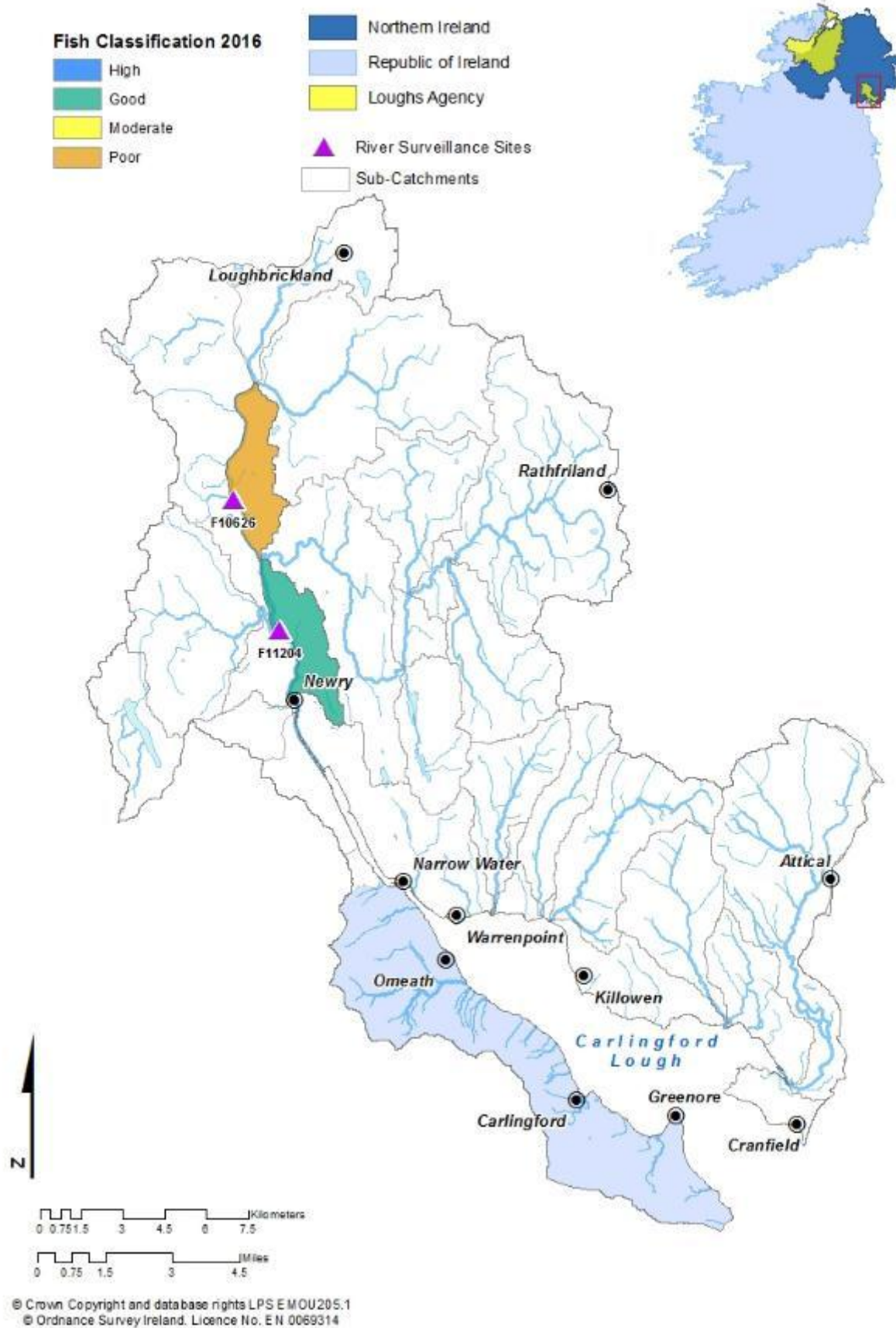


Fig.22 Loughs Agency WFD fish surveillance water body classifications 2016 Carlingford area

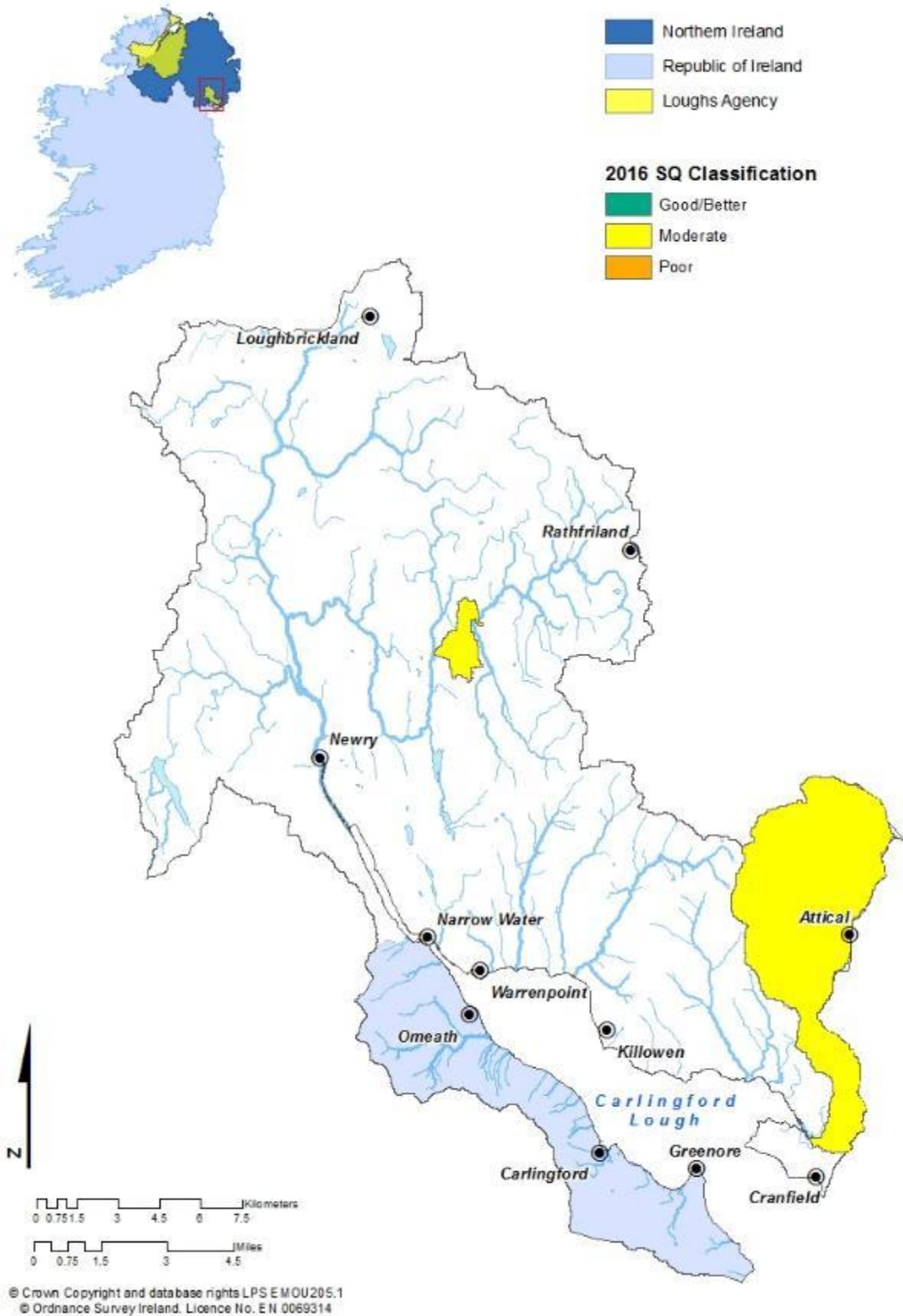


Fig.23 Indicative classifications based on Loughs Agency 5 min semi quantitative electrofishing data 2016.

4.2 CAMLOUGH LAKE FISH SURVEY 2016

Three lake fish surveys were conducted in 2016. Camlough in Co Antrim was surveyed in June 2016. The other two were in the Foyle area at Trusk Lough, Co Donegal and Enagh Lough East near Derry~Londonderry. The full reports can be accessed through the publications section of the Loughs Agency website www.loughs-agency.org

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.



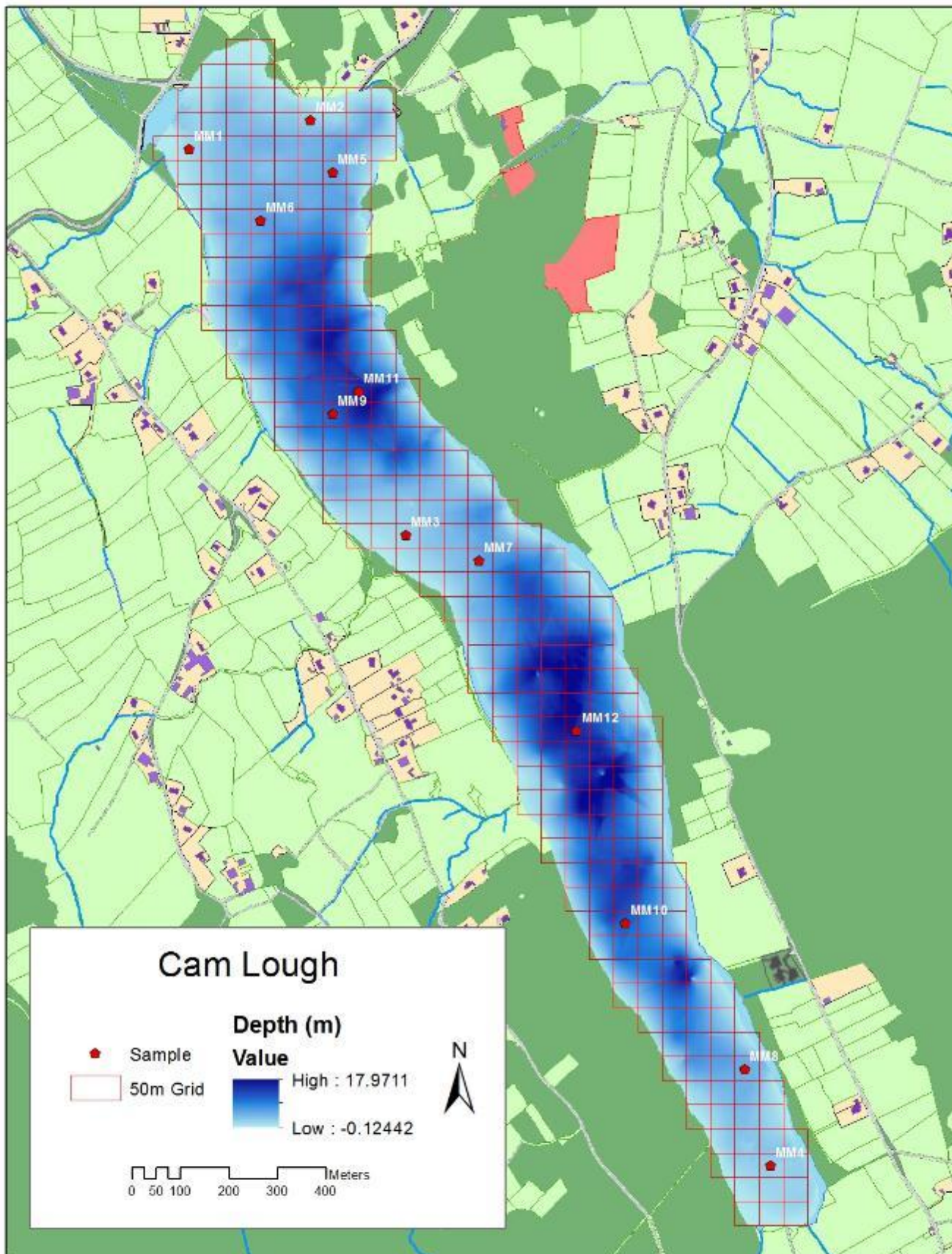


Fig.24 Bathymetry and net locations for Camlough lake fish survey 2016

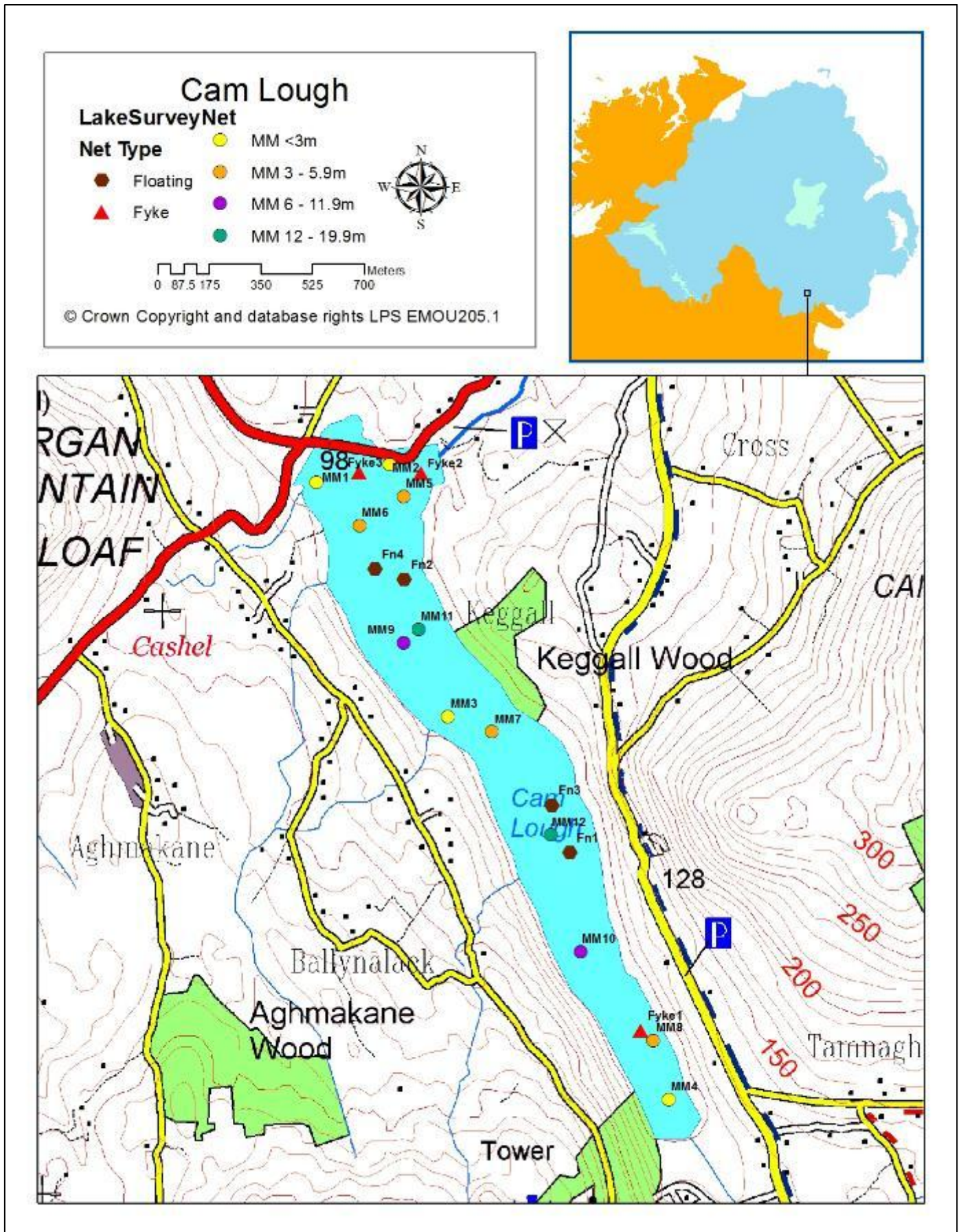


Fig.25 Net locations



4.3 INVASIVE SPECIES AND BARRIERS TO MIGRATION

Controlling priority Invasive species and Restoring native Biodiversity (**CIRB**) project. **CIRB** was an INTERREG IVA funded project co-ordinated across three jurisdictions including Northern Ireland Republic of Ireland and Scotland. The partners include Queens University Belfast, University of Ulster, Rivers and Fisheries Trusts Scotland (RAFTS), Inland Fisheries Ireland, Tweed Foundation, Galloway Fisheries Trust and the Ayrshire Rivers Trust. A number of rivers within each jurisdiction including the Faughan and Newry catchments were chosen as demonstration sites where Invasive Non Native Species (INNS) were controlled and methods for restoring native biodiversity trialled. While the Loughs Agency was not a formal project partner it was a member of the steering group overseeing the project and has facilitated events and knowledge transfer.

The CIRB project was a good example of partnership working including the engagement of stakeholders to tackle a persistent issue. The CIRB project concluded in December 2014. Online resources can be found at <http://www.qub.ac.uk/research-centres/cirb/News/> <https://vimeo.com/113119046> & <https://vimeo.com/113110997>



Fig.26 Mapping invasive species on a handheld GIS.

5.0 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.



Fig. 27 Sea trout

6.0 FISHERIES HABITAT IMPROVEMENT

In 2016 a number of instream and riparian habitat improvement projects were conducted in the Foyle and Carlingford areas. This included a wide variety of works ranging from native riparian tree planting projects, bank protection and the introduction of spawning and nursery substrate into rivers

7.0 CATCHMENT INITIATIVES

Integrated catchment management planning can only be delivered through the development of true partnerships between statutory and non-statutory partners. An understanding of desired outcomes and methods of delivery is essential in matching requirements and expectations to actions.

Exemplar catchment management planning is an iterative process developed and refined over time between parties who have fostered and developed productive working relationships.

Environmental legislation in tandem with societal requirements dictates that steps are taken to improve our natural habitats. From an aquatic perspective the Water Framework Directive is the key driver towards integrated management of our aquatic environments. The Loughs Agency acknowledges this and is eager to encourage participatory approaches as a way to effectively and efficiently meet challenging objectives.

In 2017/18 and beyond the Loughs Agency will aim to engage local stakeholders in participating in river corridor litter picks, the development of habitat improvement works and trout monitoring programmes.

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



8.0 GENERAL ACTIONS FOR 2017/2018

- Communicate monitoring findings through various media to stakeholders.
- Implement and develop actions from the Trout Strategy.
- Continue to Implement and develop fisheries monitoring programme.
- Facilitate the implementation of habitat improvement projects including riparian buffer zone creation, fencing, native species planting and in-channel habitat improvements including spawning bed and nursery habitat improvement.
- Work with interested statutory and non-statutory partners to improve water quality and native fish populations.

