Kyle Fisheries Annual Report 2016

By Dr Keith L Williams, Director & Clerk

Kyle of Sutherland District Salmon Fishery Board
Kyle of Sutherland Fisheries Trust

Bank Hosue
Ardgay
Sutherland
IV24 3BG

01863 766 702
director@kylefisheries.org
admin@kylefisheries.org

www.kylefisheries.org

Kyle of Sutherland Fisheries Trust

Chairman	Robbie Douglas Miller
Trustees	Michael Brown John Green Tom Inglis Gregor Macleod Steven Mackenzie (River Workers Representative) Richard Sankey

Kyle of Sutherland District Salmon Fisheries Board

Chairman	Robbie Douglas Miller, Lower River Shin
Proprietors	John Green, Lower Oykel Nicky Griffiths, Braelangwell Estate Gary Gruber, Skibo Estate Michael Hasson, Glenrossal Estate Alex Hunter, Dounie Estate Richard Sankey, Upper Oykel
Co-optees	William Paterson, Netsman George Skinner, Tennant Netsman Calvert Stinton, Kyle of Sutherland Angling Association Ashe Windham, Upper Oykel
Clerk	Dr Keith L Williams
Staff	Dr Keith L Williams, Director John Audsley, Bailiff Iain Gollan, Bailiff Philip Blowers, Bailiff

Chairman's Foreword

Many of you in the Kyle region and further afield in Scotland might be forgiven for thinking the Scottish Government have lost the plot. After 3 years of talking, endless meetings, a great deal of time planning and considerable cost incurred "Wild Fisheries Reform" was abandoned to all intents and purposes in early 2017. I guess we will all have a view as to whether this was an opportunity lost or a nightmare avoided but the process is something that the Scottish Government need to learn from. For nearly 4 years jobs have been as risk, investment stymied, confusion created, opportunities lost and normal business suspended. This is a great shame and I hope the Minister thinks twice before entering the fray again. During this process your Board and Trust have attempted to make some sense of what was happening and put in place the foundations for the future. Much of this will now be consigned to the dustbin and we can get on with focusing our limited time and resources on managing the Kyle, albeit within the framework of a bigger picture.

One outcome of the whole debacle has been the formation of Fisheries Management Scotland, which replaces the ASFB and RAFTS. Bringing these two organisations together will have considerable benefit and the Board and Trust will be closely involved with our new umbrella organisation which is chaired by Alister Jack.

Closer to home the main development in 2016 was the inclusion of the Upper Shin Catchment in the 2nd phase of the River Basin Management Plan which now put the onus on SSE and SEPA to implement a solution to the problem of downstream migration of smolts past the Shin dams. Work carried out by the Board and Trust over many years to establish the impassable nature of the dams to migrating smolts is now paying dividends with a "Trap and Truck" operation now the only solution being considered.

The easement of the Diebidale dam on the Carron is also moving to the next stage and the Trust will soon relinquish its advisory role in this project and pass it back to the estate to take forward. More details of this project can be found elsewhere in this report.

The Board have also been in discussions with Marine Scotland Science over the continued issue on Loch Shin of farmed smolts potentially originating from either or both Scottish Sea Farms and Migdale Smolts who operate salmon farm sites on the Loch. Escapees have the potential to cause genetic introgression with the indigenous Shin fish as well as other issues such as competition for food resources. The Board are hopeful that recent improvements in genetic sampling and additional powers granted to MSS will bring this unwelcome issue to a conclusion.

I hope 2017 brings success to all the Kyle rivers and please feel free to drop into the office in Ardgay for a chat or attend one of our regular meetings.

Robbie Douglas Miller (Chairman)
Kyle of Sutherland District Salmon Fishery Board
Kyle of Sutherland Fishery Trust

Director's Foreword

Wild Fisheries Reform was a prominent feature of 2016 and considerable effort was expended in ensuring that both the Board and Trust were well positioned to cope with any future changes to the structure of fishery management organisations. The Scottish Government announcement in early 2017 that fishery boards were to continue has rendered many of the plans that had been formulated redundant. That said, we now have greater clarity as to the nature of the management bodies and organisations that will be responsible for delivering fishery management in Scotland and must ensure that we remain forward thinking.

Running in parallel with proposed structural changes to delivery of fishery management in Scotland has been the introduction of salmon conservation regulations by the Scottish Government. Of particular importance has been the river classification process which has the potential to restrict the killing of salmon on rivers that are not deemed to have a harvestable surplus. In 2016 all Kyle of Sutherland rivers were deemed to be Category 1 rivers therefore additional management interventions such as mandatory catch and release were not considered necessary by the Scottish Government. However, this is very much a work in progress and many of the assumptions used to derive the classifications are based on limited data, often from very different areas of Scotland than the Kyle region. We have been fully engaged with Marine Scotland Science in providing local data, such as that obtained from the Oykel scale reading programme, so that the classifications best reflect what is actually happening in our rivers. I have personally participated in a number of working groups chaired by Marine Scotland Science which aim to improve the information available for future iterations of the classification process.

A sharp reminder of the importance of maintaining constant vigilance in respect of illegal fishing was received in the form of the seizure of an illegal net in the early months of 2016. The removal of this net was a reward for the consistent hard work of the bailiffing team. Fishery enforcement will remain at the core of the activities of the Board for the foreseeable future. We continuously review bailiffing operations and seek to adapt our activities to best protect the fish stocks in this area. New technology is also always being considered if it can help us better protect the fish.

A number of projects such as Pearls in Peril, investigations into smolt passage issues on the Shin and the Moray Firth Trout Initiative are approaching their natural conclusion or have now been completed. Some new projects are already in the pipeline to replace existing ones but it is clear that new initiatives will need to be developed in the near future. A number of potential project ideas have been identified and now need to be fully evaluated prior to applications for funding etc. With the demise of RAFTS the sector has lost much of its support network in terms of fundraising activity. Greater emphasis will be placed on individual fishery trusts formulating or submitting their own applications although there are positive signs already of trusts collaborating in joint funding applications for potential projects.

Finally I would like to thank all staff members, members of the Board and trustees for their support in 2016.

Keith Williams (Director)
Kyle of Sutherland District Salmon Fishery Board
Kyle of Sutherland Fishery Trust

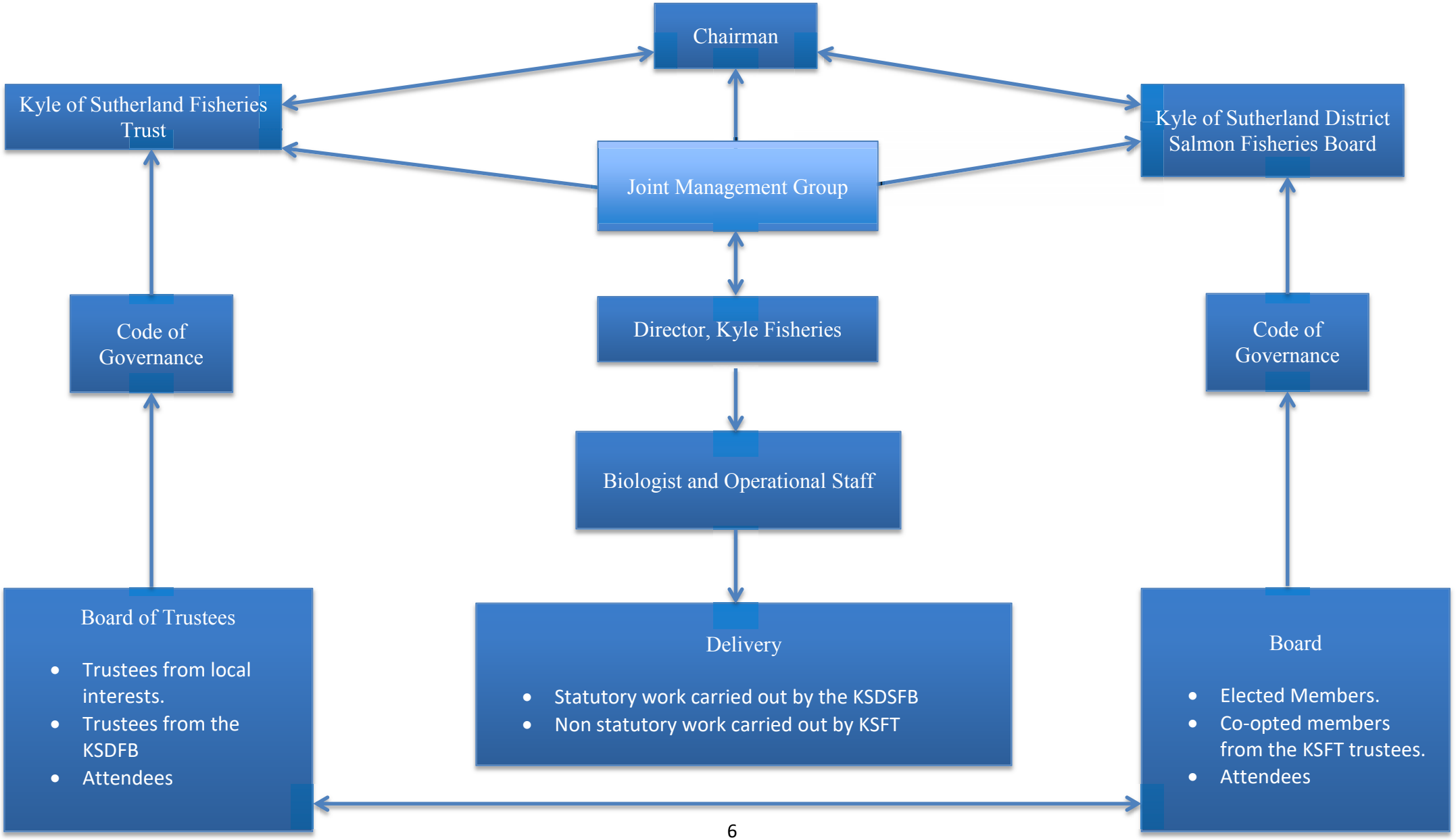
Kyle of Sutherland Fisheries Structure

Kyle of Sutherland Fisheries represents two organisations that work closely together.

The Kyle of Sutherland District Salmon Fishery Board was initially established in the 1860's and has a remit defined by statute. The remit extends to salmon and sea trout only. The original legislation has been amended on various occasions culminating in the Aquaculture and Fisheries (Scotland) Act 2013.

The Kyle of Sutherland Fisheries Trust is a registered charity and a company limited by guarantee with incorporation commencing in 2000. The Trust has a much broader remit than the Board with its sphere of operation encompassing all species of fish and the aquatic environment in general.

The structure of the operation of Kyle Fisheries is explained in the following diagram.

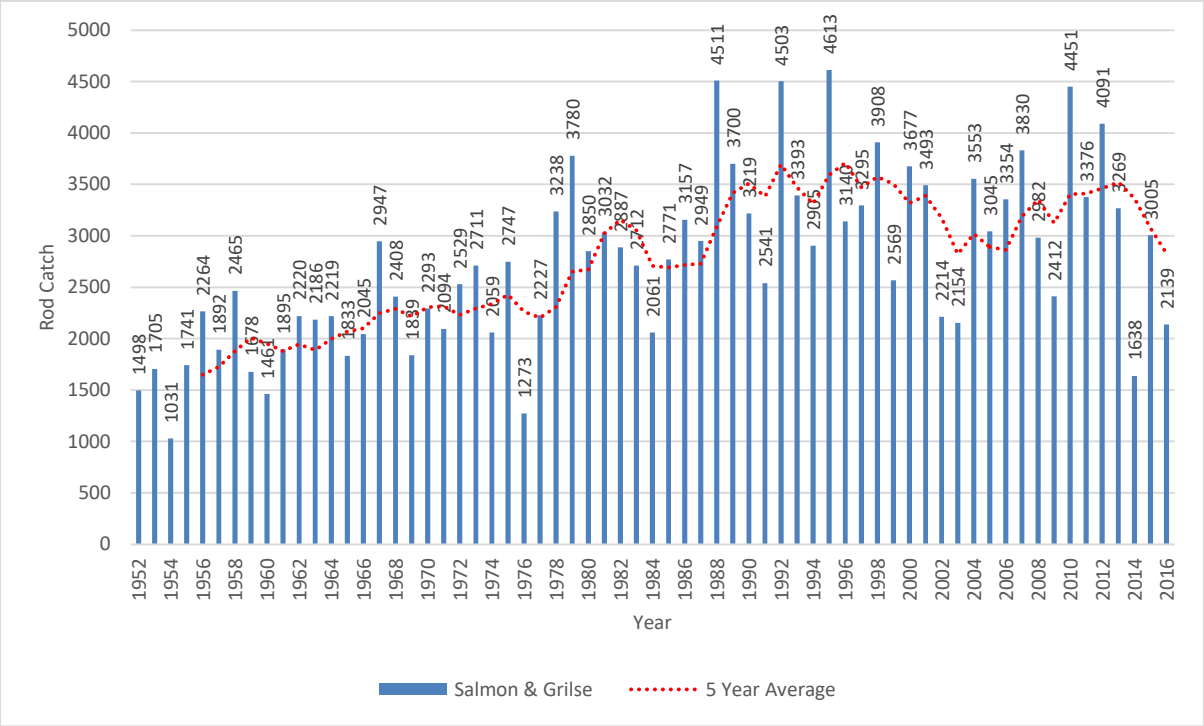

Chairman
Kyle of Sutherland Fisheries Trust
Kyle of Sutherland District Salmon Fisheries Board
Joint Management Group
Code of Governance
Director, Kyle Fisheries
Code of Governance
Biologist and Operational Staff
Board of Trustees
Trustees from local interests.
Trustees from the KSDFB
Attendees
Delivery
Statutory work carried out by the KSDSFB
Non statutory work carried out by KSFT
Board
Elected Members.
Co-opted members from the KSFT trustees.
Attendees

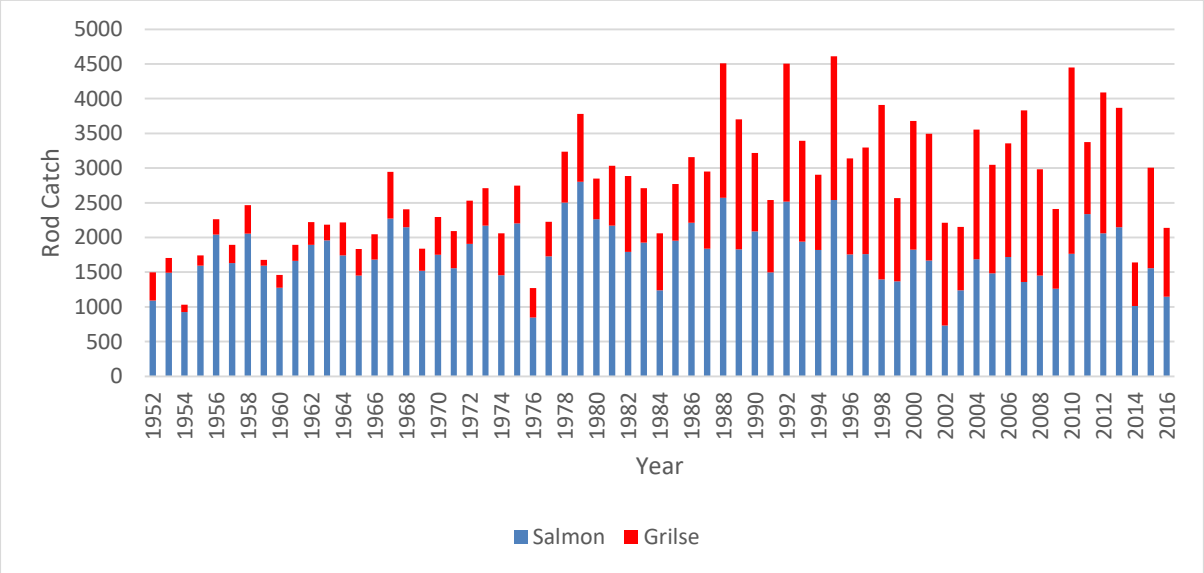
Kyle of Sutherland Fisheries District Salmon Fisheries Board

2016 Fishery Performance

Information received by the Board from rod and line proprietors suggests that the 2016 rod catch for the Kyle of Sutherland District totalled 2,139 salmon and grilse plus 548 sea trout and 390 finnock. Salmon and grilse catches were approximately 71% of the 2015 figure. The average annual catch for the period between 2011 and 2015 was 3,076 based on the Marine Scotland Science dataset.

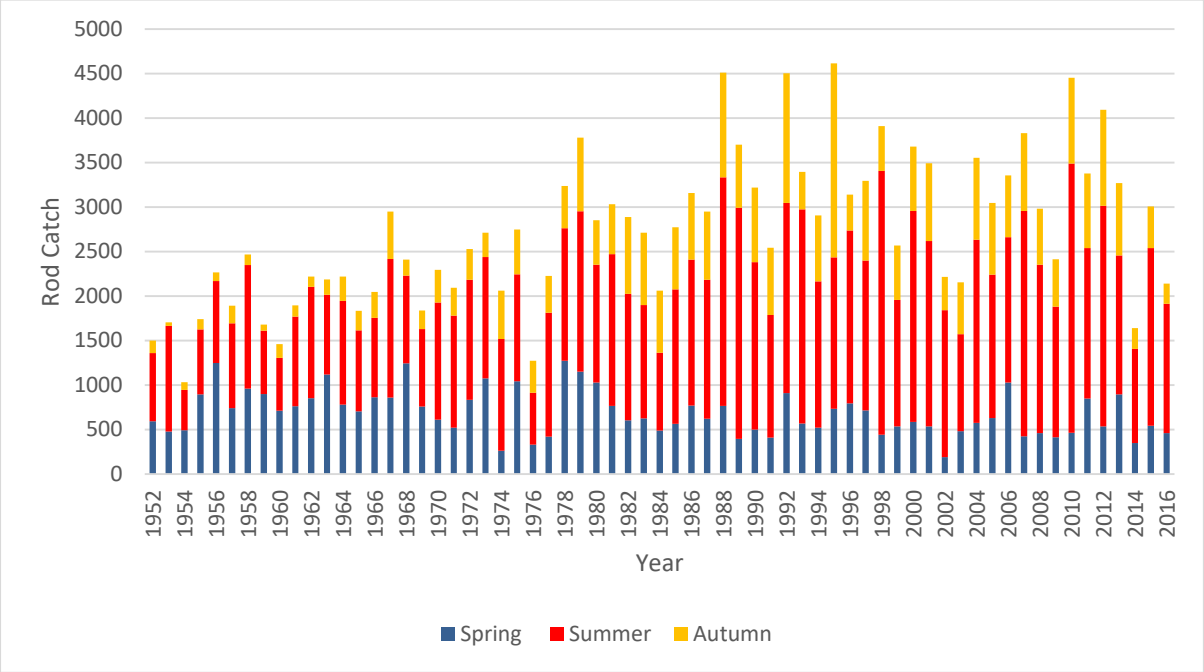
The graphs below place the provisional 2016 data collected by the Board within the historical context of the Marine Scotland Science dataset of catches from 1952-2015.





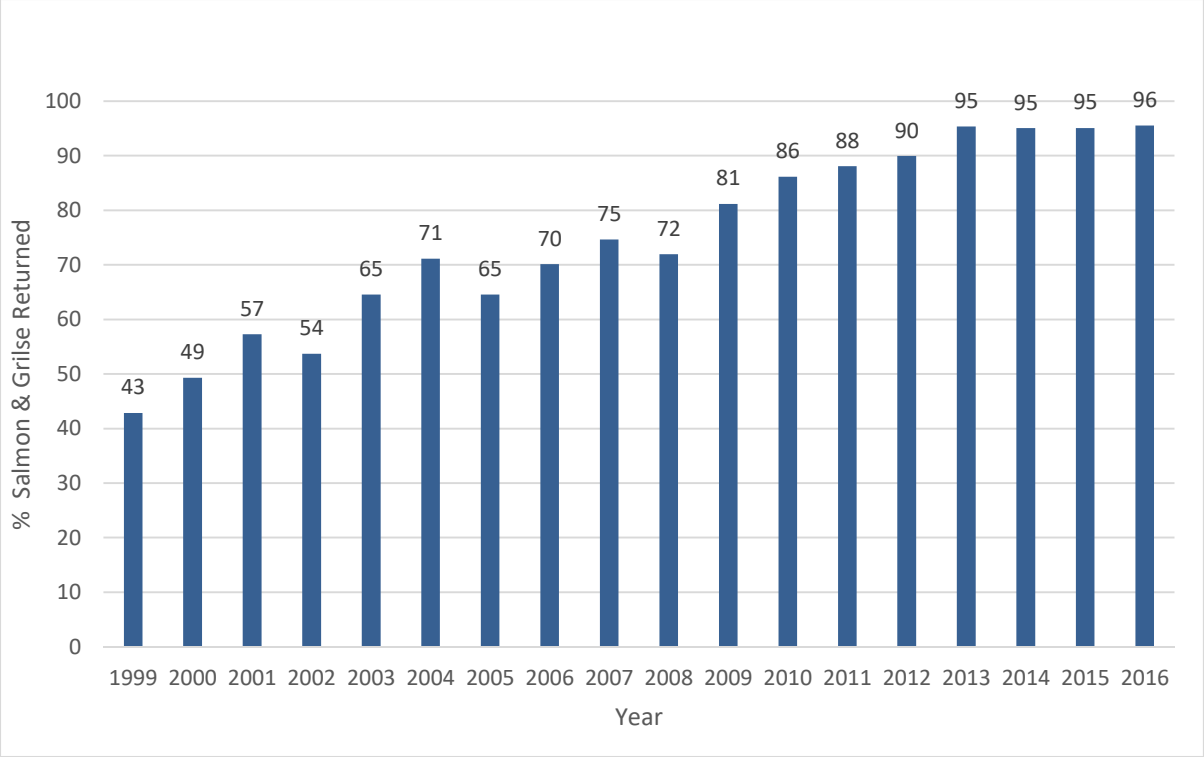
No salmon were reported from the netting stations in the Kyle of Sutherland fishery district in 2016. By law, netting is currently only permitted within estuary limits in Scotland.

It is recommended by the Association of Salmon Fishery Boards that rod catches are assessed on an annual basis using the North Atlantic Salmon Conservation Organisation rod catch tool. This tool looks at the spring (January-May) summer (June-August) and autumn (September) components of the catch over a twenty year period in order to detect a downward trend. The 2016 failed the assessment in respect of the autumn component as was also the case in 2014. In common with many other salmon fisheries in Scotland concerns have been raised in relation to the abundance of later running salmon. The graph below illustrates catches of salmon and grilse within the spring, summer and autumn periods as specified by the rod catch tool.



The 2016 rod catch returns to the Board by proprietors suggest that six fish were killed in the month of September. This number of fish is likely to approximate the number of salmon that are fatally injured due to hooking or predator damage and would be unlikely to survive even if returned.

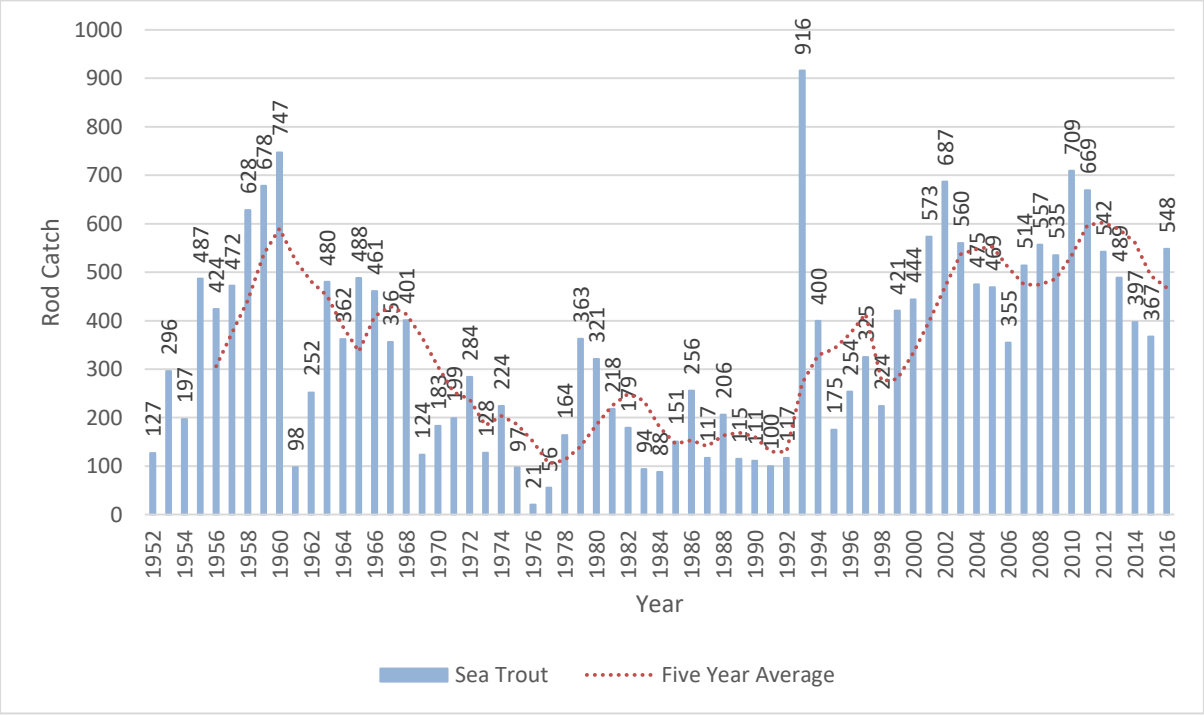
At just under 96% the percentage of salmon and grilse released by anglers in the Kyle of Sutherland during the 2016 season was the highest recorded since catch and release was voluntarily adopted. The blanket prohibition on killing salmon prior to April 1st introduced by the Scottish Government appears to have only had a marginal effect given that voluntary measures were already in place recommending that all salmon and grilse are returned prior to the middle of June within this district.



Above: Percentage of salmon and grilse returned.

Above: Salmon being released on Kyle of Sutherland Angling Association Water.

Sea trout returns from proprietors in 2016 were the highest since 2011 perhaps reflecting the good numbers of small finnock reported in the tidal waters late in the 2015 season. The Kyle of Sutherland Angling Association waters are particularly important in respect of the overall sea trout fishery. Catches on the Lower Oykel were also healthy in 2016. The graph below places the provisional 2016 data collected by the Board within the historical context of the Marine Scotland Science dataset of catches from 1952-2015. Finnock catches were down slightly on the 2015 levels but would still be considered reasonable in an historical context.



Enforcement

Regular patrols of the rivers and coastal areas of the district continued in 2016. The extensive tidal areas within the catchment represent a particular challenge and as a result motor vehicle and foot patrols are supplemented with canoe and boat patrols on a regular basis. One gill net and associated equipment was seized in 2016 with net also discovered hidden in bankside vegetation when riparian work was being undertaken. It would appear that the latter had not been used for some considerable time. A ghillie also handed in a gill net that had previously been passed to them.

In addition to monitoring netting activity, considerable effort has been expended by the bailiffing team in speaking to anglers in coastal areas where sea trout in particular may be caught. There is a widespread belief that sea trout and salmon in coastal areas can be fished for without written permission. This is not universally the case and a number of anglers have been made aware of this. In respect of other rod and line issues, one incident was referred to the police and a warning was also issued in relation to an alleged incidence of fishing out with the salmon fishing season.

Above: Gill net seized by Kyle of Sutherland bailiffs in 2016.

An important development during the latter part of 2016 was a visit to the catchment by PC Dan Sutherland, the Police Scotland Wildlife and Environmental Crime Co-ordinator based in Dingwall. An extensive tour of the catchment was undertaken in order that issues relating to illegal fishing for salmon, sea trout and pearl mussels could be discussed. Greater links with Police Scotland are vital if illegal activities are to be dealt with effectively.

Above Right: Kyle bailiffs on patrol with PC Dan Sutherland.

Hatchery - 2015/2016

Around 150,000 unfed fry were stocked into the upper reaches of the River Tirry catchment, a tributary of Loch Shin, in late spring 2016. These fish were the progeny of the salmon stripped at the Grudie facility in November 2015. The main aim of stocking salmon into the Tirry is to maintain a smolt run in order to investigate smolt passage issues in the Loch Shin area (see Trust report) as well as help maintain a viable population of salmon in the River Tirry.

Applications were submitted to Marine Scotland Science for consent to catch salmon during the close season, proprietor consents obtained and SEPA and SSE consulted regarding lowering compensation flows for the agreed netting dates in November 2016. The first attempt at netting scheduled for the 1st November had to be cancelled due to various factors but on 8th November collection proceeded. Board staff Keith, Iain, Phil, John and ghillies Robbie Eliot (Lower Shin) and Alick Murray (Lairg Estate) plus Oykel ghillies Attie MacDonald and Peter O'Neill took part in the netting with welcome tractor support to transport the fish provided by Migdale Construction in the form of Steven Mackenzie. In 2015 two pools were netted, namely the Wood Pool and the Aquarium. The latter yielded the most fish after disappointing results in the Wood Pool. Logic therefore dictated that we start in the Aquarium but needless to say the majority of fish were captured in the Wood Pool this time around! The picture above shows the catch being brought in at the Wood Pool.

The target number of hen and cock fish was quickly reached. The vast majority of the salmon captured were in good condition and of a high average size. However, some very small grilse were also caught. On a subsequent visit to the fish traps on the Conon system later in the year by Kyle Fisheries staff a similar situation was noted with some very small grilse featuring in the catches.

In contrast to recent years there were few issues relating to fungal infections. Stripping of salmon was completed over a four week period with the last stripping being undertaken on December 7th. Circa 175,000 eggs were collected and transferred from Grudie to the hatchery at Kincardine. Egg survival has been good to date and the eggs were mechanically shocked at the eyed stage. It is anticipated that unfed fry will be again stocked into the upper reaches of

the Tirry catchment. A small number of eggs are also likely to be utilised in egg box experiments in the Tirry and some eggs may be utilised in the construction of artificial redds.

Above: Replacing salmon eggs in the trays after mechanical shocking.

Consultations

Responses were made to a total of 9 consultations during 2016. Consultations were, as ever, wide ranging with responses to local forestry management plans sitting alongside national issues such as proposed alterations to fishery management structures in Scotland. The Board aims to respond to all consultations received timeously.

Predator Control

The Board remains an active participant in the Moray Firth Seal Management Plan and also is part of a coalition of Moray Firth fishery boards that collectively applies for a licence to shoot a limited quantity of piscivorous birds as an aid to scaring. In recent years a licence to shoot a small number of piscivorous birds has been received following the submission of an application to SNH. Counts of birds at a catchment level are undertaken by a combination of bailiffs and river workers in order to provide supporting information. Efforts in terms of scaring birds typically concentrate on the period leading up to and including the smolt run.

Complaints

A formal complaint was received from a member of the public on 17th August 2016 relating to an email complaint originally sent to a different organisation on 8th August 2016. The Board's complaints procedure was invoked and the Director met with the complainant at the earliest opportunity. It transpired that the complaint dated 17th August 2016 had been submitted to the Board in error in that the complainant had confused the Kyle of Sutherland District Salmon Fishery Board with another organisation. The complaint was subsequently withdrawn and the matter closed.

Compliance

Statutory good governance obligations are placed on district salmon fishery boards as defined in law by section 46 of the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003. They comprise the original obligations placed on boards by the 2003 Act together with those introduced through amendments of the 2003 Act by the Aquaculture and Fisheries (Scotland) Act 2013 which came into force on the 16th September 2013. The purpose of the obligations is to enhance openness, transparency and accountability of the management of salmon fisheries by district salmon fishery boards. They bring together existing best practice to ensure that all boards act in a manner consistent with bodies operating in the public sphere. Key activities covered by these obligations include:

- Annual reports and accounts
- Meetings of the board
- Complaints procedures
- Register of member's interests.

In order to comply with these obligations an annual public meeting and annual meeting of the qualified proprietors was held in 2016. Meeting notices and minutes of all meetings held are forwarding to the Scottish Government as is a copy of the Annual Report. Meetings are advertised on the Kyle Fisheries website as well as at the office building in Ardgay. A complaints procedure is included in the policies section of the website and a register of members interests is maintained at the Kyle Fisheries office.

Juvenile Surveys

Electro-fishing surveys were undertaken in all five major rivers in the Kyle of Sutherland catchment during 2016. Surveys are undertaken for a variety of reasons. Typically, routine monitoring is the primary reason for undertaking surveys although effort is often focussed on areas where previous surveys have identified potential issues or under performance. On occasions surveys are undertaken to inform assessments of proposed development projects or as part of other projects such as the Pearls in Peril Project or Diebidale barrier work. Methodology utilised within the Kyle of Sutherland District is usually a combination of timed fishings (typically used for investigative purposes) or fully quantitative surveys where more detailed surveys are required. In 2016 a limited electro-fishing programme was undertaken with the emphasis placed on addressing issues with direct management implications. It is anticipated that a thorough review of electro-fishing activities will be undertaken in the future.

Carron

Focus on the Carron catchment continued to centre on several key issues. Firstly it is important to ascertain if salmon have successfully passed Glencalvie falls. Typically, good densities of salmon fry are found at the Deanich site in Glen Mohr. However this was not the case in 2016 although parr were captured at this site. Investigative fishings further downstream did reveal that fry were present upstream of Glencalvie Falls albeit in small numbers. Electro-fishing was also required to support ongoing efforts to ease the obstacle to migration at Diebidale (see Trust section of this report). No salmon fry or parr were captured upstream of the obstacle in 2016 although only a single site was fished. At the site immediately downstream of the obstacle, juvenile salmon were also not present. On June7th a localised thunderstorm in the upper reaches of the Carron resulted in major landslip. This natural event resulted in large quantities of silt being deposited in the river which slowly worked its way downstream. Concerns were expressed that juvenile salmon may have been unable to survive the turbid waters. In order to ensure that juvenile salmon were still present in the main stem of the River Carron timed surveys were undertaken at a number of locations once water quality had normalised. These surveys confirmed that salmon fry and parr were present at all sites fished. The surveys undertaken also illustrate that the main stem of the River Carron is likely to have sufficient numbers of juveniles in relatively small areas to consider the use of genetic tools to estimate the number of breeding fish. This may prove to be a useful fishery management tool in the future.

Above: Large silt deposits as a resultof a landslip in the upper Carron catchment

Table 1 Density of salmon juveniles per 100m2, River Carron. Zippin values used except where* denotes minimum density estimate.

Code	Location	2016		2015		2014	
		Fry	Parr	Fry	Parr	Fry	Parr
CN/D01	Diebidale	0.00	0.00	17.98	0.00	0.00	0.00
CN/D03	Diebidale	0.00	0.00	0.00	0.00	0.00	0.00
C/GM/01	Glen Mohr	0.00	27.64	65.79	11.55	77.35	15.96

Table 2 Salmon catch per unit of effort i.e. fish per minute, River Carron.

Code	Location	CPUE Fry	CPUE Parr
C/GLD/01T	Gledfield	1	1
C/GRN/01T	Dounie	1.6	0.2
C/GRN/02T	Dounie	0.8	0.8
C/GRN/03T	Gruinairds	2.2	2.8
C/GRN/04T	Gruinairds	3.2	4.0

Cassley

Survey effort on the Cassley was restricted to investigating salmon access in the Allt an Tuir burn which enters the Cassley near Rosehall. A bridge forms a major obstacle to upstream migration (see picture right). Two sites were fished, one upstream of the obstacle and one downstream of the obstacle. As anticipated, no juvenile salmon were captured upstream of the bridge. Salmon parr were captured downstream but no salmon fry were captured.

Table 3 Density of juveniles per 100m2, River Cassley. Zippin values used except where * denotes minimum density estimate.

Code	Location	2016	
		Fry	Parr
CS/AAT/01	River Cassley	0.00	8.30
CS/AAT/02	River Cassley	0.00	0.00

Oykel

The majority of the surveys undertaken in 2016 formed part of the Pearls in Peril project. Benmore continues to be an important nursery area as illustrated by the largely positive results obtained in 2016 from the timed fishings on the main stem of the Oykel. Salmon fry and parr were again found upstream of a potential obstacle in the Benmore area. The lower reaches of burns such as Allt Rugaidh Mhor and Allt Rugaidh Beag were again surveyed in light of proposed developments.

Table 4 Density of juveniles per 100m2, River Oykel. Zippin values used except where * denotes minimum density estimate.

		2016		2015		2014	
Code	Location	Fry	Parr	Fry	Parr	Fry	Parr
ACA/02	Allt na Cailliche	62.50*	26.67	124.48	8.30*	-	-
RB/01	Allt Rugaidh Bheag	84.50	34.72	98.84	26.04*	-	-
RM/01	Allt Rugaidh Mhor	27.49	10.48*	17.47*	1.09*	-	-
AOS/01	Strathseasgaich	63.66	9.31*	133.49	19.04*	97.60	35.07
AE/03	Eileag	0.00	0.00	0.00	0.89*	3.47*	4.36

Table 5 Catch per unit of effort i.e. fish per minute, River Oykel.

		2016		2014	
Code	Location	Fry	Parr	Fry	Parr
OYK/Ben/1T	River Oykel	4.0	1.1	3.0	0.9
OYK/Ben/2T	River Oykel	5.1	1.4	6.9	1.3
OYK/Ben/3T	River Oykel	2.5	0.6	2.8	0.9

Shin

The River Tirry catchment is currently the only part of the Kyle of Sutherland system that is stocked. Few smolts were captured at the Tirry trap in 2016. Electro-fishing data from 2015 shows that parr numbers at the monitoring sites near Crask were extremely low indeed. As such, poor smolt numbers in 2016 could have been anticipated. Given the good fry numbers observed in 2014 at the monitoring sites the lack of parr and subsequently smolts is a potential cause for concern. In 2016 a River Tirry site was again electro-fished and results were more in line with normal expectations in terms of parr. Fry numbers were lower than 2015 but would still be considered reasonable. Two sites were electro-fished on the main stem of the River Shin with good numbers of both fry at both sites and good numbers of parr captured at one site where habitat favoured parr production.

Table 6 Density of juveniles per 100m2, River Shin. Zippin values used except where * denotes minimum density estimate.

		2016		2015		2014	
Code	Location	Fry	Parr	Fry	Parr	Fry	Parr
ST/06	River Tirry	61.73	21.42	163.59	0.00	202.01	23.99
RS/01	River Shin	187.33	4.92	204.52	1.00*	254.74	3.08
RS/06	River Shin	62.90	31.30	-	-	117.23	51.78

Evelix

Two sites were electro-fished in 2016 as part of the Pearls in Peril project. These sites were also fished in 2014 as part of the project. Fry and parr densities appear to continue to be healthy at both sites.

Table 7 Density of juveniles per 100m2, River Evelix. Zippin values used in all electo-fishing results shown except where * denotes minimum density estimate.

		2016		2015		2014	
Code	Location	Fry	Parr	Fry	Parr	Fry	Parr
REK/04	Evelix	29.66	32.81	-	-	59.58	21.19
REK/05	Evelix	69.26	44.63	-	-	69.21	48.90

Pearls in Peril

The Pearls in Peril project is an EU Life funded project aimed at safeguarding and increasing numbers of pearl mussels in Special Areas of Conservation as well as the species which they rely on to successfully complete their life cycle such as salmon.

There are a number of project partners across the UK. Within the Kyle of Sutherland District the key partners are Rivers and Fisheries Trusts of Scotland, SNH and Forest Enterprise Scotland. Key tasks undertaken by Kyle Fisheries staff have included electro-fishing on the Oykel and Evelix catchments, pearl mussel surveys, delivery of Pearls in the Classroom at local primary schools as well as drain blocking (see photograph to the right) and riparian tree planting in support of habitat restoration on the Oykel catchment.

More actions will be delivered by Kyle Fisheries staff prior to the project closing in March 2017 including additional ditch blocking. For more information see the project website:
www.pearlsinperil.org.uk

Above: Area close to Loch Ailsh where forestry has been mulched to aid peatland restoration as part of the Pearls in Peril project. Picture courtesy of Neil McInnes, Forestry Commission Scotland.

Floy Tagging

During the 2016 season ghillies tagged a number of salmon caught on rod and line by anglers in several of the Kyle rivers. It is intended that tagging will again take place in 2017. Initial data suggest that there were three recaptures from circa 180 tagged fish, all of which were tagged and recaptured on the Carron. A further salmon tagged on the Shin was recaptured as a kelt on the River Oykel in the spring of 2017. A report will be produced of the results of the study.

Diseased Fish

An Oykel salmon suspected of having ulcerative dermal necrosis was tested by Marine Scotland Science Fish Health Inspectorate. The test results were negative.

Future Activities

Effective enforcement will remain the core activity of the organisation. A thorough review of data requirement, particularly juvenile surveys and habitat data will be undertaken with a view to establishing a more efficient use of personnel and resources.

Kyle of Sutherland Fisheries Trust

Moray Firth Trout Initiative

Kyle of Sutherland Fisheries Trust has hosted the Moray Firth Trout Initiative and its predecessor the Moray Firth Sea Trout Project since its inception. Due to funding uncertainties the project ended in the autumn of 2016. We are pleased to say that the Project Officer, Marcus Walters, is now employed by one of the project partners the Deveron, Bogie and Isla Fisheries Trust and we wish him well in this new role. Further information such as reports etc. produced by the project can be found at:

www.morayfirthtrout.org

Shin Smolt Trapping

Traps were deployed at four sites on Loch Shin tributaries. Rotary screw traps (see photograph right) and box traps were used depending on the suitability of the location. The catch of 7,240 wild smolts from the Fiag was the highest recorded since trapping commenced at that site (see Table 8). The numbers of smolts captured on the Tirry was very disappointing, however. The primary reason for trapping smolts on the Loch Shin tributaries is to assess possible mitigation activities related to problems in downstream smolt passage at the hydroelectric dams close to Lairg. The bulk of the smolts captured were transported by road and released into the River Shin. It is considered that this gives the smolts the best opportunity to reach the sea and subsequently return as adults. A proportion of Tirry and Fiag smolts were tagged using PIT (passive integrated transponders) tags in order to assess if more smolts would exit the dams if flows were increased as much as possible via SSE generating. Smolt curtains were also deployed by SSE in order to try and guide the smolts in the 'correct' direction. Tags are detected automatically as fish enter or leave the fish pass at Shin Diversion Dam. Numbers of smolts exiting the dams in 2016 remained disappointing and subsequently the decision has been made by SEPA that flow manipulation is not a viable mitigation measure.

A proportion of the smolts captured in the traps and subsequently released downstream of the dams are also PIT tagged to ensure that transported fish are returning to the headwaters as adults. It is particularly heartening that 24 smolts tagged in the spring of 2015 were detected at Shin Diversion returning as grilse in 2016 with 21 of the 24 having been released downstream of the dam.

Table 8 Totals of smolts captured in traps 2011-2016.

	Corriekinloch		Merkland		Fiag		Tirry	
Year	Putative Farmed	Wild Smolts	Putative Farmed	Wild Smolts	Putative Farmed	Wild Smolts	Putative Farmed	Wild Smolts
2011	19	24	288	217	9	1924	0	1350
2012	1	42	537	507	2	2149	0	1021
2013	0	12	373	553	4	2523	0	604
2014	0	22	301	262	0	726	0	2351
2015	0	32	144	590	2	2261	0	803
2016	0	21	217	441	11	7240	0	238

Mark-recapture trials were also undertaken on the Tirry and Fiag. This involves the tagging or marking of smolts which are subsequently released a short distance upstream of the trap. This allows for estimates to be made in respect of trap efficiency and in turn estimates of the numbers of smolts being produced in an area. In the case of the Fiag the estimate derived for 2016 was 12,396 smolts ± 1,107. In the case of the Tirry the estimate derived was 1,496 smolts ± 714 although the Tirry estimates should be treated with extreme caution due to relatively small numbers of smolts captured and subsequently recaptured. Funding for elements of this project has been received from SSE and further contributions in expertise have been made by SEPA.

Marine Scotland Science Fish Health Inspectorate staff obtained samples from smolts suspected of being of farmed origin. We await the results of the testing undertaken.

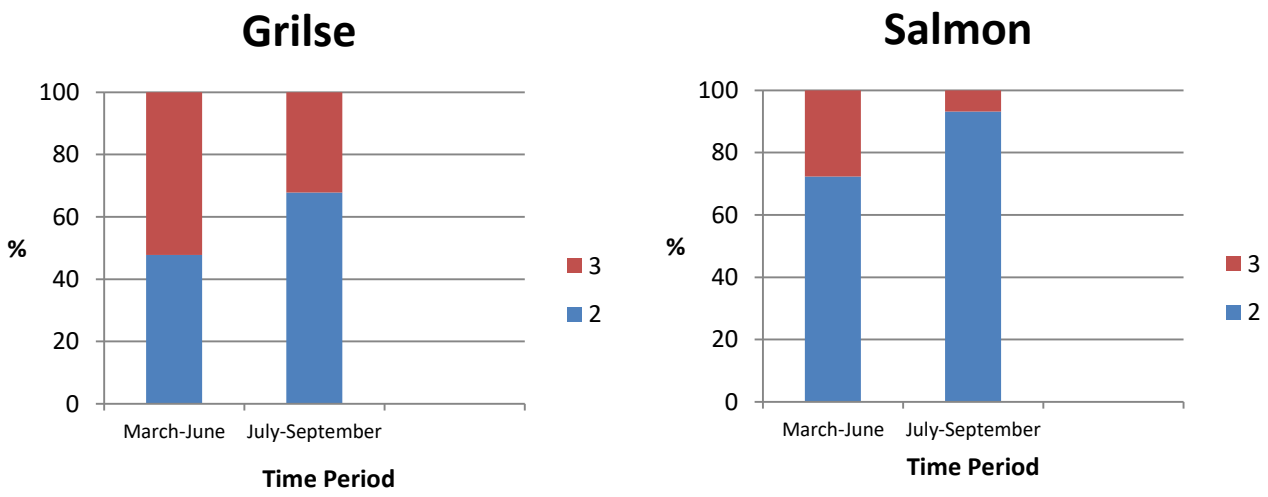
Diebidale

Habitat and electro-fishing surveys undertaken by Kyle Fisheries have demonstrated that the dam at Diebidale Lochan, part of the River Carron system, constitutes a severe obstacle to fish migration. In 2015 a feasibility study into potential remedial action aimed at improving fish passage was commissioned from the consultants Atkins. A follow-up study has now been commissioned from AECOM. This second study aims to assess the potential impacts of complete removal of the dam structure.

Oykel Scale Sampling

Between 2013 and 2015 a total of 453 adult salmon and 172 juvenile salmon were sampled on the Oykel system. The primary purpose of the study was to identify the locations where juvenile salmon parr aged two years or older were present and assess the river and sea age of adult fish captured during the season. Studies undertaken in other catchments in Scotland suggest that older age classes of smolts have a tendency to return earlier in the year than their younger counterparts. The Oykel salmon appear to exhibit similar tendencies as shown in Figure 1.

Figure 1 Percentages of grilse and salmon aged two (blue bar) and three winters old (red bar) when migrating to the sea split into March-June and July-September periods.

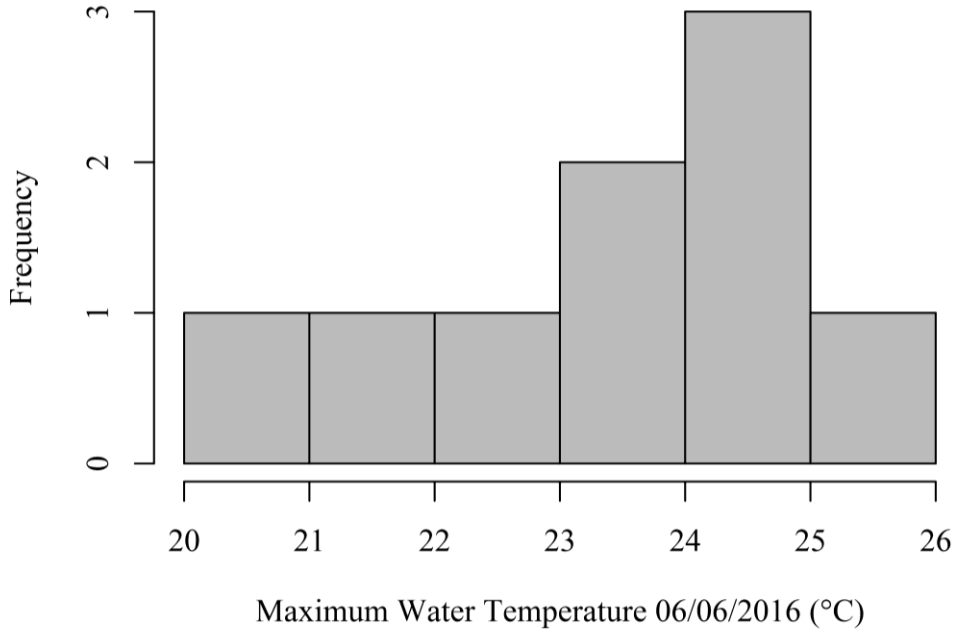


A full report of the findings of the Oykel scale reading programme is available on the Kyle Fisheries website. Data was also submitted to Marine Scotland Science as part of the programme to improve salmon age structure information used in conservation limits and river categorisation.

Temperature Network

In the summer of 2015 Kyle Fisheries staff assisted Marine Scotland Science in the deployment of nine temperature recorders in the Oykel catchment. Downloads of the loggers have subsequently taken place and data is now becoming available.

Figure 2 Maximum water temperature across sites on 6th June 2016. Chart courtesy of Marine Scotland Science.



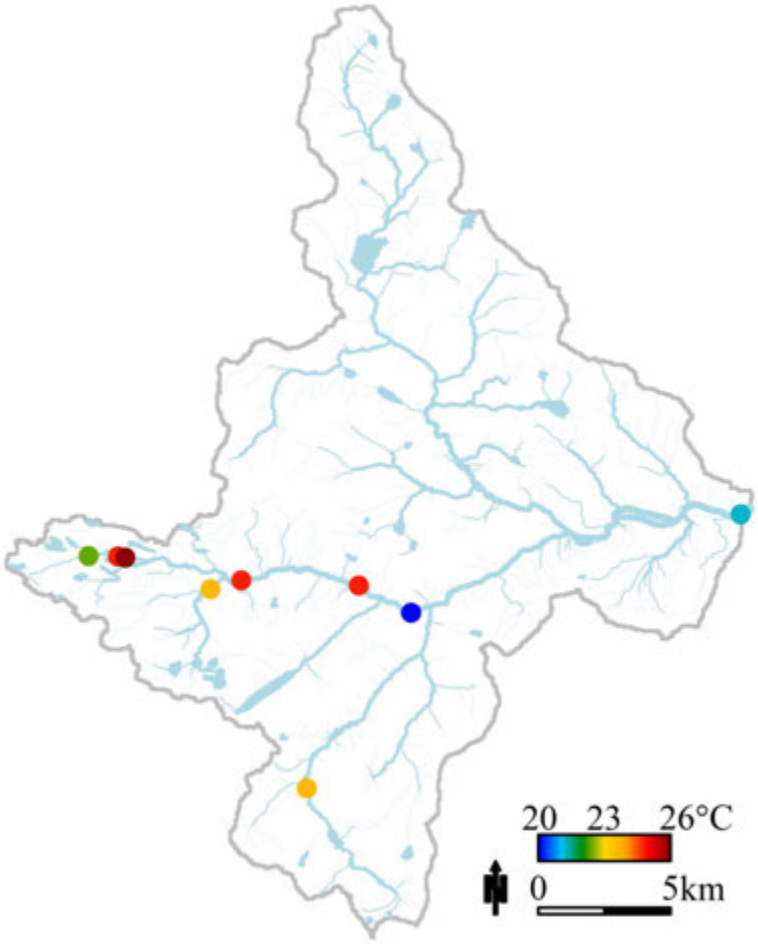
As an illustration of the type of analyses that can be undertaken, Marine Scotland Science have identified the hottest day of 2016 i.e. the day with the hottest mean maximum daily temperature across all nine sites. This was the 6th June. Figure 2 illustrates the considerable variation in maximum temperatures across the network of recorders on that day. Figure3 shows the same data in map form. Sites were specifically chosen for their characteristics such as presence or absence of natural shading. The data has been collected as part of the SRTMN project. More information on the project can be found at:

http://www.gov.scot/Topics/marine/Salmon-Trout-Coarse/Freshwater/Monitoring/temperature)

http://www.gov.scot/Resource/0051/00515943.pdf

Data from the Oykel has also been used in the development of a daily national river temperature model.

Figure 3 Map showing maximum temperatures at individual sites. Map courtesy of Marine Scotland Science.



Catchment boundaries, SEPA (2009), Some features of this map are based on digital spatial data licensed from Centre for Ecology and Hydrology, NERC.Crown copyright and database right (2017). All rights reserved. Ordnance Survey Licence number 100024655. Scottish Government Marine Scotland, February 2017

Kyle of Sutherland District Salmon Fishery Board
Profit and Loss Account - Year Ending 31st May 2016

		2016		2015
Revenue		**£**		**£**
Turnover		391,549		359,083
		391,549		359,083
Cost of sales		1,503		3,001
Gross Profit		**390,046**		356,082
Overheads				
Expenses	384,012		369,456	
	384,012		369,456	
Operating Profit /(Loss)		6,034		(13,374)
Bank interest receivable		10		13
(Loss) / Profit for year		**6,044**		(13,361)

Kyle of Sutherland District Salmon Fishery Board
Balance Sheet - Year Ending 31st May 2016

		2016	2015
		£	**£**
Fixed Assets		124,996	246,116
Current Assets			
Debtors	87,944		1,809
Bank	19,882		53,230
	107,826		55,039
Creditors	111,372		185,749
Net current liabilities		(3,546)	(130,710)
Total assets less current liabilities		121,450	115,406
Capital & Reserves		121,450	115,406

Full Accounts For Both Board and Trust Are Available From www.kylefisheries.org. Hard Copies Available on Request.

Kyle of Sutherland Fisheries Trust
Statement of Financial Activities - Year Ended 31 May 2016

Income	Unrestricted	Restricted	Total Funds Year to 31 May 2016	Total Funds Period from 1/4/14 to 31/5/15
Voluntary income	68,834	32,429	101,263	93,033
Fundraising				2,500
Other	7,149		7,149	6,437
	75,983	32,429	108,412	101,970
Expenditure				
Costs of generating funds	(35,863)	(44,126)	(79,989)	(54,871)
Governance	(17,158)		(17,158)	(15,401)
Other	(13,063)		(13,063)	(8,292)
	(66,084)	(44,126)	(110,210)	(78,564)
Net Incoming resources for the year	9,899	(11,697)	(1,798)	23,406
Total funds brought forward	85,540	71,030	156,570	133,164
Total funds carried forward	95,439	59,333	154,772	156,570

Kyle of Sutherland Fisheries Trust
Balance Sheet - 31 May 2016

		2016 £	2015 £
Fixed Assets		71,028	71,287
Current Assets			
Debtors	2,937		1,932
Bank	84,170		84,775
	87,107		86,707
Creditors	(3,363)		(1,424)
Net current assets		83,744	85,283
Total assets less current liabilities		154,772	156,570
Funds			
Restricted Income Funds		59,333	71,030
Unrestricted Income Funds		95,439	85,540
		154,772	156,570

Notes