Consultation report

Options for extending the sea trout beach net fishery in Yorkshire and North East England

January 2020

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Executive summary

This consultation is seeking views on the potential to extend the beach netting season for sea trout in Yorkshire and the North East. The closing date for this consultation is Friday 31 January 2020.

In December 2018, new national byelaws were confirmed by the Fisheries Minister for the better protection of vulnerable salmon stocks. These byelaws closed the North East drift net fishery completely. The beach net fishery was closed for salmon but allowed to continue to fish for sea trout only, generally over a shorter netting season.

To mitigate the impact of the byelaws, the Fisheries Minister instructed the Agency to investigate the possibility of extending the T and J net netting season for sea trout only, if this was possible without impacting those salmon stocks exposed to the fishery.

Between June and August 2019, the Environment Agency undertook field trials of modified designs of beach nets in the Yorkshire and North East coastal net fishery to deliver the minister's instruction, and to determine whether modified designs of nets could be used to catch sea trout preferentially to salmon.

The trial results show that the modified designs of nets proved successful in intercepting sea trout whilst only entangling a small number of salmon, the great majority of which were returned with minimal damage or delay, and that the impact on salmon stocks was very low.

Thee trial concluded there was not likely to be any significant effect, alone or in combination of extending the netting season for sea trout on any formally designated sites or species, including on salmon stocks originating from rivers on the east coast of Scotland where salmon are designated as an interest feature of Special Areas of Conservation (SACs).

The impact of an extended sea trout net fishery on sea trout stocks is less certain. The trial results in the North East show an average reduction in catches of sea trout of around 30% and of around 65% in Yorkshire compared to recent net catches.

Catches from both trials indicate an extension to the current sea trout netting season is likely to be economically viable.

Netting of salmon has been prohibited to better protect vulnerable and recovering salmon stocks. The majority of the salmon stocks in England exposed to the beach net fishery are assessed as being probably at risk, emphasising the need to prohibit exploitation of salmon in coastal nets.

In Scotland, of the largest of the east coast Scottish salmon rivers contributing to the North East coast net fishery, the Tweed, Tay, North Esk and Dee, are assessed as likely to meet their conservation limit over a 5-year period with no additional management action required.

A number of salmon populations in Scotland known to be contributing to the net fishery are assessed as requiring action to reduce exploitation to zero in 2020. Six of these the salmon stocks have deteriorated in grading since 2019.

The latest assessments of sea trout stocks contributing to the coastal net fishery indicate the Coquet, Wear, Tees and Yorkshire Esk sea trout stocks are probably at risk.

Rod catches have shown a marked downward trend, falling to historically low levels on a number of rivers. The Tyne is assessed as probably not at risk, although the sea trout rod catch also shows a downward trend since 2010.

In Scotland, sea trout from the River Tweed catchment contribute to catches in the North East coastal net fishery. Since 2010, rod catches of sea trout on the Tweed have shown a declining trend, with the 2018 rod catch of 775 being the lowest since 1984.

We recognise that factors other than exploitation in net fisheries impact upon salmon stocks, and are working with partners to address all factors affecting salmon stocks under the Salmon Five Point Approach, including water quality, fish habitat and access improvements, as well as working to better control exploitation.

Any recommendation to extend the netting season using modified designs of T and J nets would require amendments to national and regional fisheries byelaws. This would require the publication of relevant evidence, formal advertisement and response to any objections raised, and confirmation of any byelaw changes we might make by the Secretary of State.

We are seeking to achieve the best balance between providing vulnerable stocks with much needed added protection, while minimising the economic and social impacts of regulating the beach net fishery for sea trout, allowing a sea trout fishery as far as is sustainable, in line with precautionary principles.

A number of options have been developed for potentially extending the beach net fishing season for salmon. Each option would have some degree of impact on the livelihoods of beach net licensees and on the stocks of salmon and sea trout exposed to the net fishery.

These options are summarised below.

Option 1. Maintain the current beach netting season with no extension

This option would not provide any extension to the current netting season using modified nets, maintaining the existing regulation of the fishery under the existing national and regional byelaws.

Option 2. Extend the beach netting season on a trial basis in 2020

Restoring the netting season to the whole of the beach net fishery as part of an extended trial in 2020 would provide a more comprehensive and robust evidence base on which to evaluate the impact of netting on salmon and sea trout stocks.

Option 3. Partially restoring the beach netting season for sea trout

Netting for sea trout could be partially restored to balance providing necessary protection for salmon and sea trout stocks intercepted by the fishery and enabling licensees to derive economic benefit from netting sea trout.

This option would see an impact on catches intermediate between Option 1 and Options 2 and 4, and provide an intermediate level of economic benefit for licensees.

Option 4. Fully restoring the beach netting season for sea trout

Reverting to the historic netting season end date of 30 August would provide the greatest economic benefit for licensees, by maximising their opportunity to catch sea trout.

This option would provide the lowest level of protection for salmon and sea trout stocks exposed to the beach net fishery. Fully restoring the sea trout netting season would increase the numbers of salmon entangled in the beach nets by the greatest extent.

Extending the use of modified designs of nets to the whole of the netting season

Results from the trials of modified T and J nets indicate that both designs, particularly the modified T net, are significantly less efficient at intercepting salmon than the traditional designs of net.

In order to minimise the impact of sea trout netting on salmon stocks, and to reduce the potential injury to salmon which may become entangled in the nets and require release, a requirement to use the modified designs of T and J nets over the whole of the netting season could be introduced.

Use of the modified designs of net would be likely to result in lower catches of sea trout and therefore reduce the economic benefit for licensees.

This option could be adopted in parallel with any of the four options described above.

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1. About this consultation

1.1 What is the purpose of this consultation?

This consultation is seeking your views on possible options to extend the beach netting season for sea trout in Yorkshire and the North East.

This forms part of our commitment to restore and protect salmon and sea trout stocks in England, maximising opportunities for stock recovery and longer term sustainability. At the same time, we are seeking to extend opportunities for sea trout net fisheries, as far as this can be achieved in a way which is consistent with providing necessary protection for both salmon and sea trout stocks contributing to those fisheries.

This consultation will be of interest to anyone who fishes for and/or has an interest in the salmon and sea trout populations in North East England and Eastern Scotland, their conservation and management, including:

- commercial sea trout netsmen and their representative organisations
- anglers, their representative organisations and those who own, lease or manage fishing for salmon and sea trout
- other businesses that support, or are supported by sea trout fishing
- salmon and sea trout conservation organisations
- other conservation organisations and Non-Governmental Organisations such as Wildlife Trusts and Rivers Trusts
- government agencies and authorities including Inshore Fisheries and Conservation Authorities and Natural England
- members of the public with an interest in salmon and sea trout management and conservation

1.2 What are the objectives of the consultation?

This consultation set outs, and seeks views on options for extending the season for beach net fishing for sea trout in Yorkshire and the North East using modified designs of nets. The objectives of the consultation are to:

- describe the Yorkshire and North East coastal net fishery and summarise the historic management, levels of participation, catches and contributing stocks of salmon and sea trout.
- present the results of field trials undertaken in 2019 assessing the performance and operation of modified forms of beach nets in Yorkshire and the North East
- describe the current status of salmon and sea trout stocks exploited by the beach net fishery
- present possible options for extending the season length in the beach net fishery for sea trout
- seek views on the range of options presented from those who would be affected by or have an interest in them
- quantify and evaluate the extent of likely impacts or benefits of the presented options on salmon and sea trout stocks
- understand from your perspective the likely impacts and benefits to the wider environment of the options presented
- engage with stakeholders who have an interest or involvement in management of the beach net fishery so that we have sufficient information to be able to meet our duties if we propose to change the regulation of the fishery.

1.3 How will responses be used?

The responses gathered from this consultation will be considered and used to help formulate a preferred option or set of options.

In the event the final preferred position involves amending or introducing any national or regional fisheries byelaws, these will be formally advertised providing another opportunity for anyone with an interest to comment on the measures presented.

1.4 Seeking your views

Electronic copies of this consultation report and the accompanying technical report describing the field trials of modified nets in 2019 are available on the Agency's consultation website. Paper copies of the reports are available on request.

The closing date for this consultation is Friday 21 February 2020.

Responses may be made on the Environment Agency in three ways:

1. Using the online response form on the Environment Agency's consultation website
2. By email to: jonathan.shelley@environment-agency.gov.uk
3. By post to:

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Newcastle upon Tyne

NE4 7AR

Please provide us with as much information as you feel necessary to support your position, and indicate your preferred option, or alternative recommendation.

Any responses we receive to the consultation (excluding personal information and financial data) will be made publicly available. This includes comments received by email and post unless respondents have specifically requested that we keep their response confidential.

We will not publish names of individuals who respond, but we will publish the name of the organisation for those responses made on behalf of organisations.

Following the consultation we will produce a consultation response document summarising responses to the consultation, and our recommendations for the future management of the net fishery. This document will be published online. Hard copies will be made available upon request.

2. Introduction

As part of our duty to maintain, improve and develop salmon and sea trout fisheries in England, the Environment Agency has the power under the Salmon and Freshwater Fisheries Act 1975 (SAFFA) Section 26 to licence fishing for salmon and migratory trout, and the power to make

fisheries byelaws in England, under Section 210 and Schedule 25 to the Water Resources Act 1991 and the Scotland Act 1998 (Border Rivers) Order 1999.

In December 2018, new national byelaws were confirmed by the Fisheries Minister for the better protection of vulnerable salmon stocks. These byelaws had a significant impact on the North East and Yorkshire coastal net fishery, which typically accounts for around 95% of the salmon net catch in England.

These byelaws closed the drift net fishery completely. The beach net fishery, comprising T nets and J nets was closed for salmon, but allowed to continue to fish for sea trout only, generally over a shorter netting season, depending on the number of salmon typically taken in that part of the net fishery.

These changes were introduced to offer increased protection to vulnerable salmon stocks, but still allow a sea trout fishery in the earlier part of the year, as far as that was consistent with protecting salmon stocks. The end date for each district was set at that date after which it was determined that the level of bycatch on salmon became too large.

The 2018 byelaws placed a substantial financial burden on licensees. To mitigate the impact of the byelaws, the Fisheries Minister instructed the Agency to investigate the possibility of extending the T and J net netting season for sea trout only, if this was possible without impacting those salmon stocks exposed to the fishery.

Between June and August 2019, the Environment Agency undertook field trials of modified designs of beach nets in the Yorkshire and North East coastal net fishery to deliver the minister's instruction, and to determine whether modified designs of nets could be used to catch sea trout preferentially to salmon.

Detailed results from this field trial are reported fully in a separate technical report.

This report summarises the results of the modified net trial and considers whether the existing beach net fishery can be further extended to allow greater fishing opportunities for sea trout, whilst still conferring necessary and appropriate levels of protection on vulnerable salmon stocks.

Options for the future regulation of the sea trout net fishery are presented considering the performance of the modified nets, the status of contributing stocks of salmon and sea trout, the impact of the net fishery upon those stocks.

3. Description of the net fishery

The North East net fishery is comprised of the tidal waters from Berwick on Tweed to the mouth of the Humber estuary. It extends between the high water mark and the seaward limit of the Environment Agency’s jurisdiction at six nautical miles to sea, as shown in Figure 1 below.

The current net fishery is comprised of anchored beach nets which operate as fixed engines. There are two types of beach nets, T nets and J nets.

The fishery is divided into seven districts for beach nets, with T nets generally operating in District 1, and J nets operating in Districts 3 to 7. There are no longer any nets operating in District 2. Fishing is generally prohibited within Conservation Areas around the mouths of estuaries.

Historically, a drift net fishery operated in Yorkshire and the North East since the early part of the nineteenth century. The drift net fishery was closed in 2018 to reduce exploitation of vulnerable salmon stocks.

3.1 T nets

T nets comprise a 'leader' usually about 200 metres in length, stretching out from the beach to a “headpiece” up to 92 metres in length which contains two traps or monks, with funnel entrances.

The leader of a T net can enmesh salmon and sea trout, although typically only a small proportion of the catch is taken this way. Most fish, especially salmon are retained in the bags or traps comprising the headpiece free swimming, other fish, particularly the smaller sea trout, become entangled in the netting of the headpiece.

The design of the various components of a T net are shown in Figure 2 below.

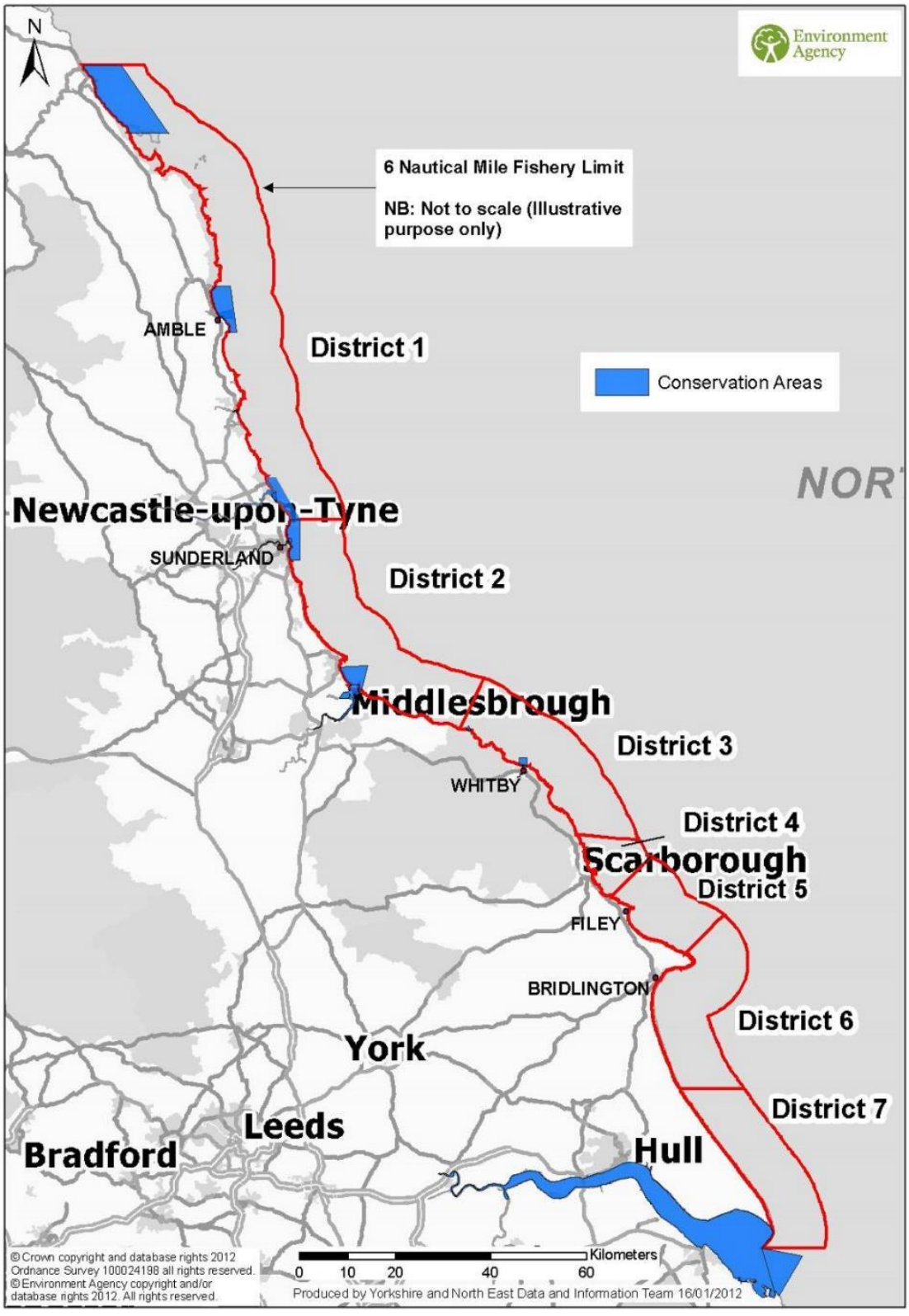

Figure 1. Districts of the North East coast net fishery map.

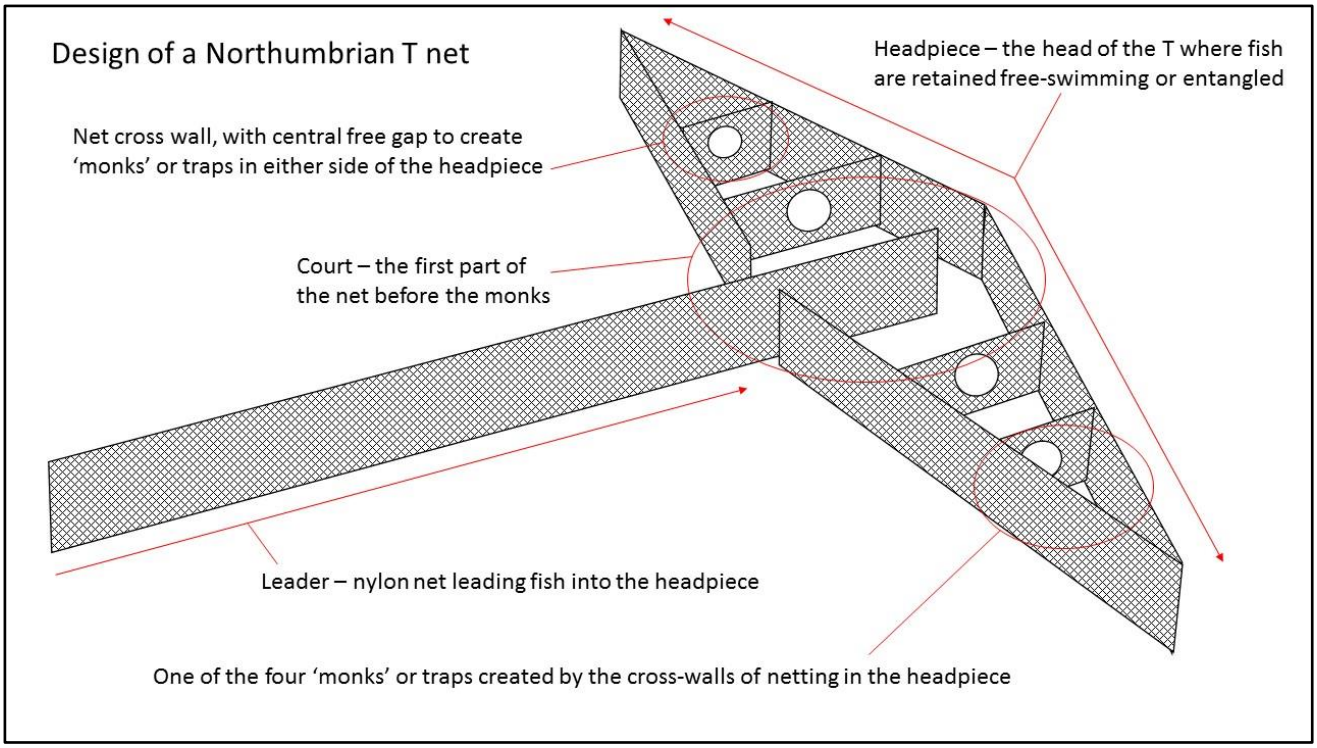

Figure 2. Design and components of a Northumbrian T net

3.2 J nets

The construction of a J net is much simpler than the T net. It is made from a length of netting up to 370 metres in total length which extends from the beach and is then turned back on itself to form a partly open box or compound, forming in plan view the shape of a letter J.

Fish are caught in J nets by becoming enmeshed or entangled in the leader or within the walls of the compound forming the terminal letter J, which is comprised of monofilament netting.

The design of a J net is shown in Figure 3 below.

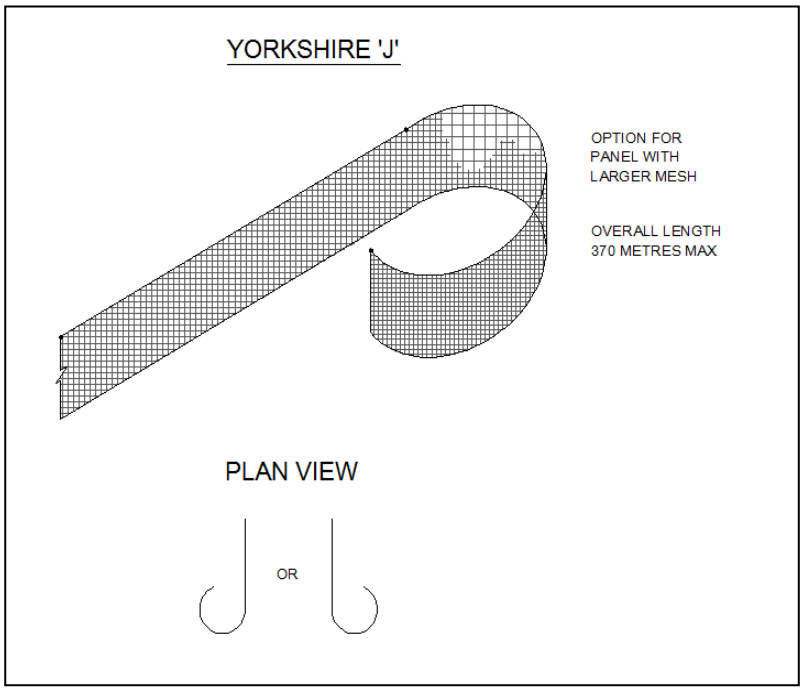

Figure 3: Diagram of a J net

3.3 The North East coast net fishery as a mixed stock fishery

Both T nets and J nets operate as mixed stock fisheries, in that both types of nets exploit salmon and sea trout from a large number of different rivers, and hence separate populations, along the eastern coast of Britain.

This mode of operation introduces difficulties in fisheries management, as it is not possible to effectively protect the most vulnerable of the contributing stocks. This is because it is not possible to determine with high confidence the impact of the fishery on each of the contributing stocks.

The proportion of salmon from each exploited population contributing to the net fishery will differ from year to year, and in different parts of the fishery in each year. The variable contribution to the net fishery from each of the individual salmon populations makes an assessment of the impact of the net fishery on individual contributing stocks very difficult.

As a result of these annual variations in catch composition, protecting the weakest of the contributing stocks proves problematic, since the impact of the fishery on the weakest of the contributing stocks cannot be known with confidence.

The UK Government has international obligations to the North Atlantic Salmon Conservation Organisation (NASCO) to close such coastal mixed stock fisheries, as it is not possible to manage them in such a way as to effectively protect contributing salmon stocks.

There are multiple lines of evidence confirming the mixed stock fishery status of the North East coast net fishery, which are summarised below.

Salmon populations known to contribute significantly to the North East nets include the Yorkshire Ouse system, Yorkshire Esk, Tees, Wear, Tyne, Coquet, Aln, Tweed, Forth, South Esk, North Esk, Tay and River Dee. Further north, rivers including the Spey and Deveron are known to contribute salmon to the net fishery in smaller numbers.

The contribution of salmon to the net fishery is a function both of the productivity of the river and size of the salmon population, with larger populations likely to contribute to catches to a greater degree than smaller ones, and proximity to the net fishery, with catchments nearer to the fishery likely to contribute in greater proportion than more distant populations.

3.3.1 Adult tagging studies

In tagging studies undertaken in the late 1970's, a total of 670 adult salmon captured in drift and T nets were externally tagged before being released. Subsequent recaptures of these tagged fish in other fisheries indicated that they returned to all the major east coast British salmon rivers, from the river Wear in the south to the Aberdeenshire Dee in the north.

3.3.2 Microtag recoveries of salmon and sea trout

Microtags are very small pieces of coded wire inserted under anaesthetic into the cartilage in the nose of juvenile salmon and sea trout that can subsequently be detected and read by scanners.

Between 1983 and 1994, over 675,000 salmon, and a smaller number of sea trout reared at the Kielder Hatchery were microtagged before release to the region's principal salmon. Over 100,000 wild salmon and sea trout from the rivers Wear, Esk and Coquet were also captured as smolts and microtagged during this period.

Microtagged fish had their adipose fin removed as an identifying feature, and the net fishery was scanned for recaptures through a targeted programme of checking the landed catch at the various fish merchants receiving the landings.

The majority of salmon from all rivers of origin were recovered in the northern part of the fishery, in Districts 1 and 2, where fishing effort was greatest. This pattern was particularly pronounced for the more northern rivers, reflecting the abundance of fish returning to their native rivers. It is likely that the majority of these recoveries were from drift nets.

The districts in the Yorkshire area of the fishery, where fishing effort was lower, and at a greater distance from the principal salmon rivers, take fewer salmon.

The pattern of exploitation for sea trout showed a greater degree of local exploitation. This reflects a higher exploitation of sea trout in the T and J nets than in the drift net fishery which was operating at this time.

Sea trout were predominantly taken in the district containing the home river - District 3 for the Esk, District 2 for the Wear and District 1 for the Coquet, although sea trout from all three rivers were taken across the whole of the net fishery.

3.3.3 Salmon genetic analyses

Both Atlantic salmon and sea trout exhibit strong homing behaviour and return to spawn in their native rivers and streams with a high degree of accuracy. This results in relatively distinct groups of interbreeding individuals which have a degree of reproductive isolation. Therefore, distinct genetic groups can develop between rivers. Such genetic structuring can be exploited to investigate the composition of fish catches by river of origin. Two differing genetic techniques have been employed to analyse catches in the North East net fishery.

In 2011, genetic analyses using microsatellites of almost 2,000 adult salmon captured in the net fishery demonstrated that all parts of the fishery exploited mixed stocks, taking salmon from rivers along the east coast of Britain in both England and Scotland.

The estimated proportion of Scottish origin fish was 70-75% in the Northumbrian drift nets, 30-50% in the Northumbrian T nets, 60-70% in the Yorkshire drift nets and around 50% in the Yorkshire J nets. A map showing the location of major salmon populations contributing to the net fishery is shown in Figure 4 below. (NB. The rivers Eden and Lune on the west coast do not contribute to the North East net fishery).

In 2013, a different genetic technique using Single Nucleotide Polymorphism (SNP) analyses was performed to determine the origin and proportions of different stock components captured in the fishery. A total of 1,000 fishery samples were screened, and the analysis confirmed again that all parts of the North East Coast net fishery exploits mixed stocks of both Scottish (c.47%) and English (c.53%) origin salmon.

3.3.4 Sea trout genetic analysis

In 2011 a Single Nucleotide Polymorphism (SNP) genetic study of 917 sea trout captured during the 2011 netting season confirmed that sea trout from a large number of catchments were also exploited by the fishery.

Of the sea trout samples provided by netsmen for this study, 727 (79%) could be reliably assigned to their river of origin using the baseline profiles. The largest proportions of individual river stocks were caught closest to the river of origin

Sea trout from the Tweed, Aln and Coquet river systems could not be separated into discrete populations, and were therefore grouped together as a single population group.

The majority of sea trout originated from rivers in Yorkshire and the North East of England, and from the River Tweed, with a smaller number from other Scottish rivers on the east coast.

Very small numbers of sea trout from the River Adur in Sussex and from catchments along the west coast of Denmark were also identified from genetic samples.

A total of 463 sea trout samples taken from the T net fishery in District 1 could be assigned to a specific sea trout population with a high level of confidence. The results of these analyses are shown in Figure 5 below.

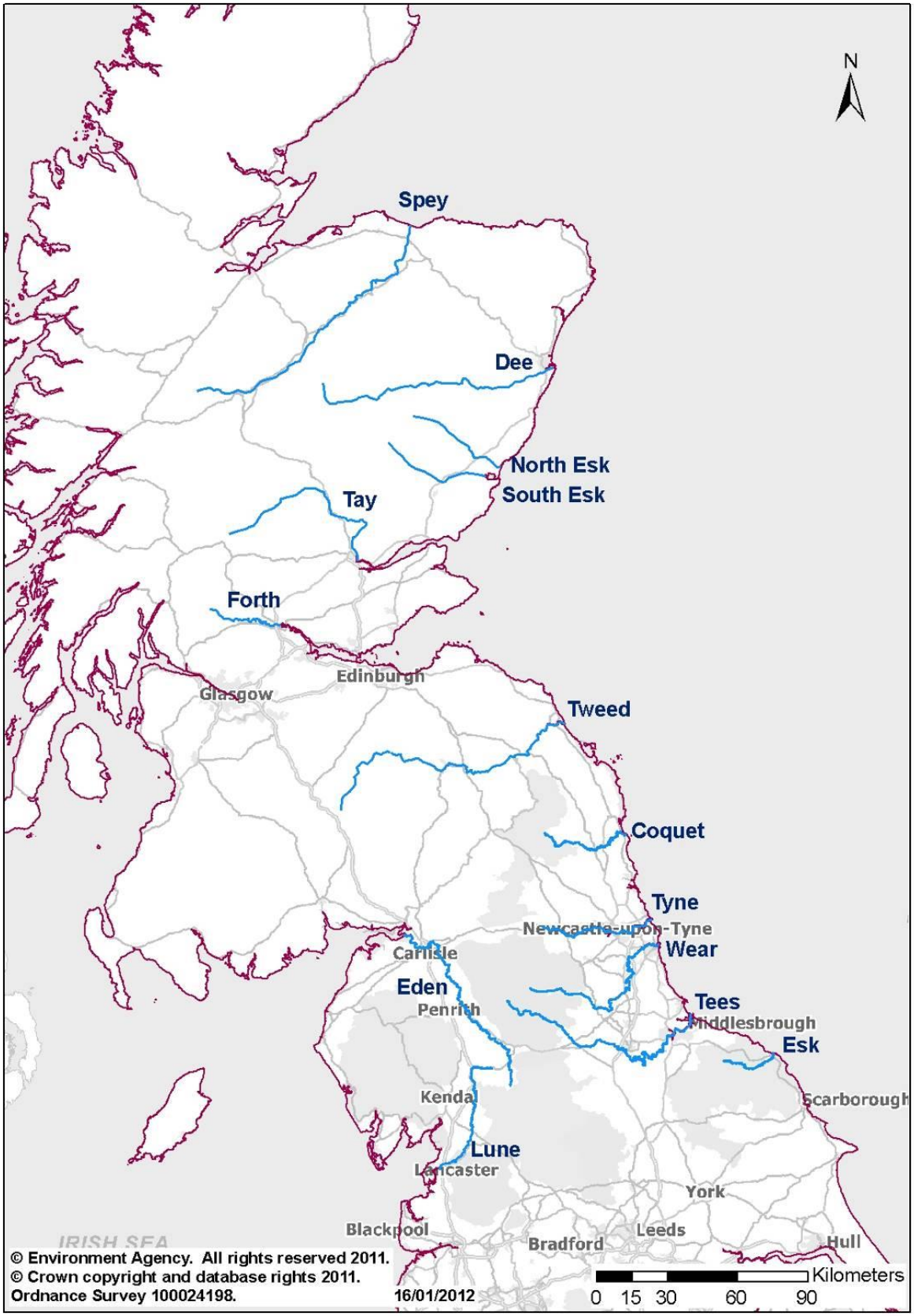

Figure 4. Map showing the location of major salmon populations contributing to the net fishery

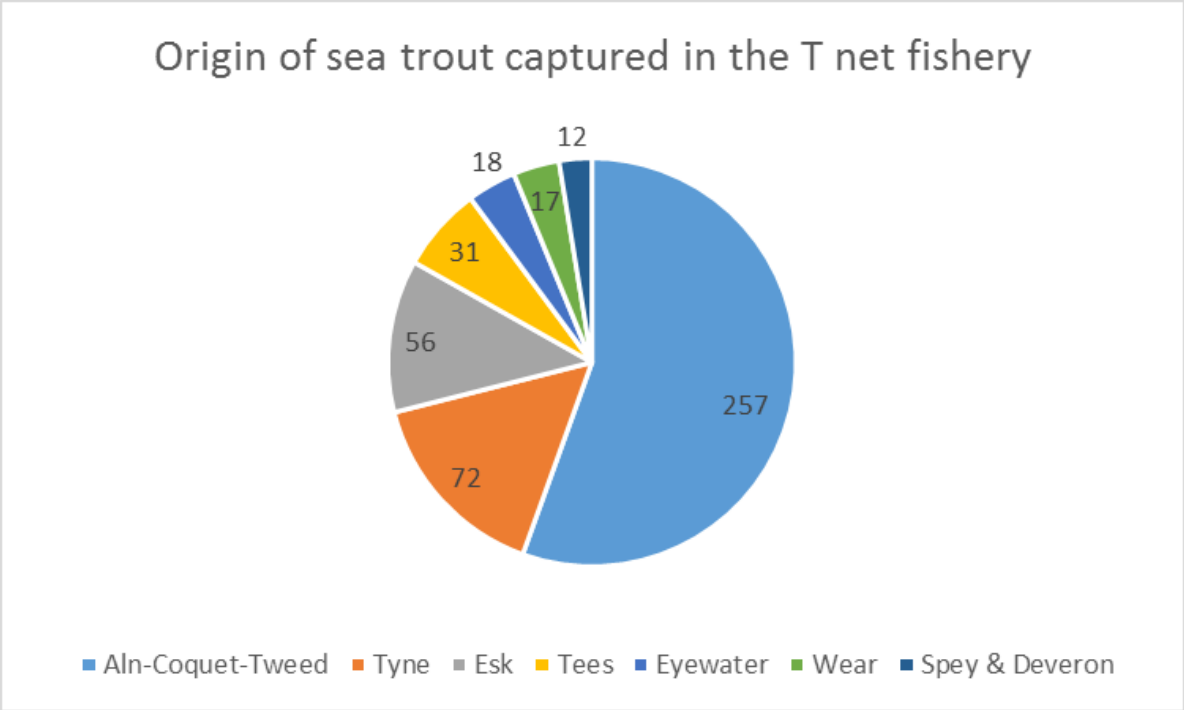

Figure 5. The origin of sea trout captured in the T net fishery in District 1

A smaller number of samples were analysed from the J net fishery in Yorkshire, and provided similar results to those from the T net fishery.

4. The policy framework

We have a duty under the Environment Act 1995 to maintain, improve and develop fisheries of salmon, trout, freshwater fish, eel, lamprey and smelt. We also have more general duties to:

1. Promote the conservation and enhancement of the amenity of inland and coastal waters;
2. Conservation of flora and fauna dependant on the aquatic environment;
3. Have regard to desirability of promoting economic growth when we make regulatory decisions;
4. Comply with the requirements of the Regulators' Code and Growth Duty

A summary of the key elements of the policy framework concerning the management of exploitation of salmon and sea trout in the net fishery is given below:

4.1 Better Sea Trout and Salmon Fisheries Strategy 2008 - 2021

It is our position, set out in ‘Better Sea Trout and Salmon Fisheries, Our Strategy for 2008-2021’ to move to close coastal net fisheries that exploit predominantly mixed stocks where our capacity to manage individual stocks is compromised.

As a general principle, our aim is to reduce the exploitation of at-risk stocks to zero, first by seeking voluntary constraints then, where voluntary measures prove ineffective or impractical, by introducing mandatory controls on fishing to ensure stocks are sustained whilst fishing opportunity is optimised.

We also take into account the NASCO Guidelines for the Management of Salmon Fisheries.

In managing exploitation, conservation needs are determined first and then options are reviewed for management which meet that need, taking into account costs and benefits together with social, cultural and economic implications.

Under the Environment Act 1995 and subsequent guidance, we must consider the economic and social well-being of rural communities and have regard to the costs and benefits of its actions.

We support regulated exploitation of salmon and sea trout provided that such exploitation is sustainable. When reducing exploitation, we give due regard to the needs of those dependent on the fishery to earn a living.

4.2 Salmon Five Point Approach

To address concerns regarding the poor performance of salmon stocks across England, the Salmon Five Point Approach was developed by the Environment Agency, Government and partner fishery organisations in 2015.

The Approach's mission is "to restore the abundance, diversity and resilience of salmon stocks throughout England", and it is doing this in five key areas, these are:

1. Improve marine survival
2. Further reduce exploitation by nets and rods
3. Remove barriers to migration and enhance habitat
4. Safeguard sufficient flows
5. Maximise spawning success by improving water quality

The Approach recognises that the single most important factor impacting the status of salmon populations is declining marine survival, but addressing pressures on salmon stocks across all five of these areas is needed so that the number of adult salmon returning to spawn can be improved.

The review of the NLO is contributing to the key area of reducing exploitation. The Five Point Approach sets out that we will review the regulation of net and fixed engine fisheries, with a presumption of only allowing exploitation where there is a harvestable surplus, and of ending coastal mixed stock fisheries for salmon.

4.3 NASCO advice on Mixed Stock Fisheries

NASCO defines a mixed stock fishery as one exploiting a significant number of salmon from two or more river stocks. NASCO guidance is that mixed-stock fisheries, particularly in coastal waters or on the high seas, pose particular difficulties for management. This is because they cannot target only stocks that are at full reproductive capacity, if there are stocks below their conservation limit within the mixed-stock being fished.

Management of such fisheries should be based on the status of individual river stocks which are exploited by the fishery. Conservation would be best achieved if fisheries target stocks that have been demonstrated to be at full reproductive capacity.

NASCO guidance for management of salmon is that:

1. In managing salmon fisheries, priority should be given to conserving the productive capacity of all individual salmon stocks;

2. Managers should demonstrate that they are being more cautious when information is uncertain, unreliable or inadequate, and the absence of adequate scientific information should not be used as a reason for postponing or failing to take conservation and management measures;

3. Ideally, forecasts of stock abundance for all stocks contributing to the fishery would be used to determine the harvestable surplus or appropriate level of fishing effort, with in-season adjustments being made to reflect actual returns;

4. Where forecasts of abundance are not available, harvest levels could be based on historical data to assess if there is likely to be a harvestable surplus;

5. Fishing on stocks that are below conservation limits should not be permitted. If a decision is made to allow fishing on a stock that is below its conservation limit, on the basis of overriding socio-economic factors, fishing should clearly be limited to a level that will still permit stock recovery within a stated timeframe.

Specifically for mixed stock fisheries, the further advice from NASCO is that:

1. Rational management of a mixed stock fishery requires knowledge of the stocks that contribute to the fishery and the status of each of those stocks;

2. Where such fisheries operate, managers should have a clear policy for their management that takes account of the additional risks attributable to, among other things, the number of stocks being exploited and their size and productivity;

3. Management actions should aim to protect the weakest of the contributing stocks.

4.4 Statutory nature conservation designations

Under the Conservation of Habitats and Species Regulations (2010) the Environment Agency is required to have regard to the Regulations when carrying out any of its functions. In respect of fisheries this is addressed by requiring compliance with byelaws and NLOs, which are considered plans or projects under the regulations and therefore are subject to appropriate assessment if they are likely to cause a significant effect.

These provisions relate to species or sites designated as Special Areas of Conservation (SAC) or Special Protection Areas (SPA) under the Habitats Directive and Birds Directive respectively.

Under the Wildlife and Countryside Act 1981 as incorporated by the Countryside and Rights of Way Act (CROW) 2000, the Environment Agency is required to consult Natural England when granting any consent, licence or permit for activities to be carried out in or capable of affecting Sites of Special Scientific Interest (SSSI).

The sea trout netting trial in 2019 was supported by a Habitats Regulations Assessment, which concluded there was no likely significant adverse impact arising from the trial on any interest feature of any designated site, including salmon populations exposed to the fishery which are designated as interest features of Special Areas of Conservation (SACs).

Any changes to regulation of the fishery will similarly be accompanied by a formal Habitats Regulations Assessment in consultation with Natural England.

5. Regulation of the net fishery

The net fishery is regulated by a number of Acts, byelaws and orders. Key provisions are summarised below.

5.1 Net Limitation Orders from 1992

Since 1992 the Yorkshire and North East coastal net fishery has been regulated by a series of Net Limitation Orders (NLOs) which have stipulated that as licensees retired or otherwise left the fishery voluntarily, their licences are not made available to other potential licensees.

In this way the fishery number of licensees participating in the fishery has reduced over time, without preventing those already participating in the fishery from continuing to do so if they chose to do so, in order to minimise any economic hardship.

Initially, the NLOs restricted drift netting only, but in 2012 the NLO provisions were extended to the whole net fishery, to include T and J nets.

5.2 National spring salmon byelaws 1999

In 1999 national byelaws to protect declining stocks of early-running spring salmon were introduced. This had the effect of preventing salmon being captured in the fishery before 1 June in any year.

Both T and J nets have been allowed to fish in this early part of the season, but must return unharmed any salmon they catch, whereas the drift netting season was shortened to begin on 1 June, to protect spring fish.

5.3 Drift net buyout 2003

In 2003 compensation arrangements were agreed with drift netsmen. A voluntary buy-out of drift net licences jointly funded by Defra and the North Atlantic Salmon Fund UK was implemented.

Under the provisions of the NLO, this buyout had the effect of greatly reducing the number of drift nets operating in the fishery from 67 in 2002 to 17 in 2003, since once current licensees surrendered their drift net licences, they became unavailable to potential new entrants to the fishery.

5.4 Drift net closure and national byelaws 2018

The UK Government has international obligations to close mixed stock coastal salmon net fisheries, as it is not possible to manage them in such a way as to effectively protect the various contributing salmon stocks, some of which are assessed as being at risk and requiring increased levels of protection.

Taking into account the latest evidence available relating to the status of salmon populations, the impact of the North East net fisheries upon contributing stocks, and the impact upon salmon net fishermen in the North East, new byelaws were confirmed in December 2018.

These byelaws have had a substantial impact on the North East coastal net fishery, and are summarised below:

1. The North East coast drift net fishery was closed in December 2018.

2. The T and J net fisheries were closed for salmon in December 2018.

3. A sea trout only beach net fishery was licensed in Yorkshire and the North East as follows:

Districts 1:	26 March to 31 May inclusive
District 2:	(No licences issued)
District 3:	26 March to 30 June inclusive
Districts 4 & 5:	26 March to 31 July inclusive
Districts 6 & 7:	26 March to 31 August inclusive

4. No person may use a net to fish for salmon and sea trout during the hours of darkness in the Yorkshire and North East net fishery.

5. T and J nets will fish on a sea trout only basis, with any salmon captured being returned with the least delay.

6. Catches and fishing effort

6.1 Fishing effort in the net fishery

The number of licences issued in the net fishery is shown in Figure 5 below, annotated with key milestones in the regulation of the fishery.

At the beginning of the single regional NLO period in 1993, there were 124 drift net licences issued. This number reduced over time as licensees left the fishery to 67 drift net licences in 2002.

The number of drift net licences issued then fell substantially to 17 in 2003, as 50 licensees participated in a buyout co-funded by Defra and the private sector. The continuation of the reducing NLO saw a modest continued decline in the intervening period.

In 2018, a total of 11 licensees remained in the drift net fishery when the drift net fishery was closed in December.

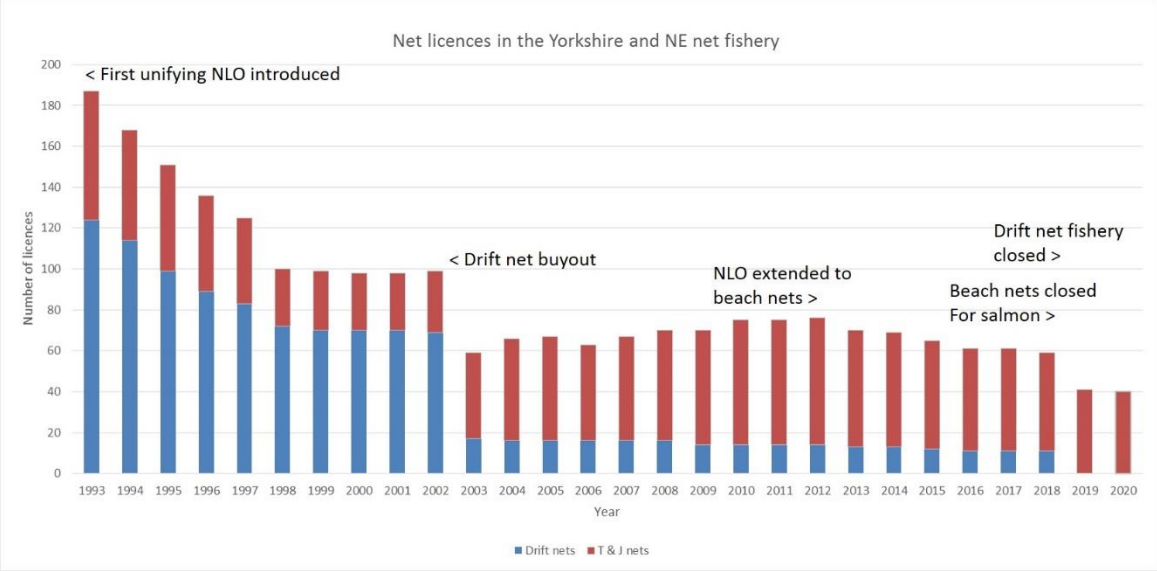

Figure 5. Numbers of licences issued in the net fishery 1993 - 2020

The number of T and J net licenses issued shows a different pattern. At the start of the period, 63 licences were issued for T and J nets. This number fell to 28 by 2000, as the number of applications did not meet the number of licences available.

After the 2002 buyout, the number of T and J net licences issued increased, partly as a result of former drift net licensees opting to transfer fishing effort to beach nets. This increase continued steadily until 2012, when the maximum number of 62 licences for T and J nets was issued.

The 2012 NLO extended the reducing order on net licences to T and J nets, such that only those licensees already holding a T or J net licence were able to apply for the same type of licence in the following year, and licences could no longer be transferred.

In 2012, there were 14 drift net licensees, and 62 T and J net licensees in the net fishery. Since that time, the NLO has caused the number of net license issued to fall as licensees left the fishery and their licences were not reallocated.

For the 2018 fishing season, a total of 11 drift net licences and 49 T and J net licences were issued. The introduction of the national salmon byelaws in 2018 saw the number of drift net licences fall to zero as the fishery was closed, and the number of T and J net licences reduce to 41 in 2019

A total of 40 licensees have applied for licences in 2020, although the number of licensees who will elect to take out a licence for the 2020 season is currently unknown.

The number of beach net licences issued in each District of the fishery since the NLO was extended to beach nets in 2012 is shown in in Table 1 and Figure 6 below.

Year	D1	D2	D3	D4	D5	D6	D7	Total
2012	26	1	10	1	9	12	3	62
2013	26	1	7	1	7	12	3	57
2014	26	1	7	1	7	11	3	56
2015	26	0	7	1	7	10	2	53
2016	23	0	7	1	7	10	2	50
2017	23	0	7	1	7	10	2	50
2018	22	0	7	1	7	9	2	48
2019	20	0	7	1	6	5	2	41
2020	19	0	7	1	6	5	2	40

Table 1. Number of beach net licences issued between 2012 and 2020 (licences applied for).

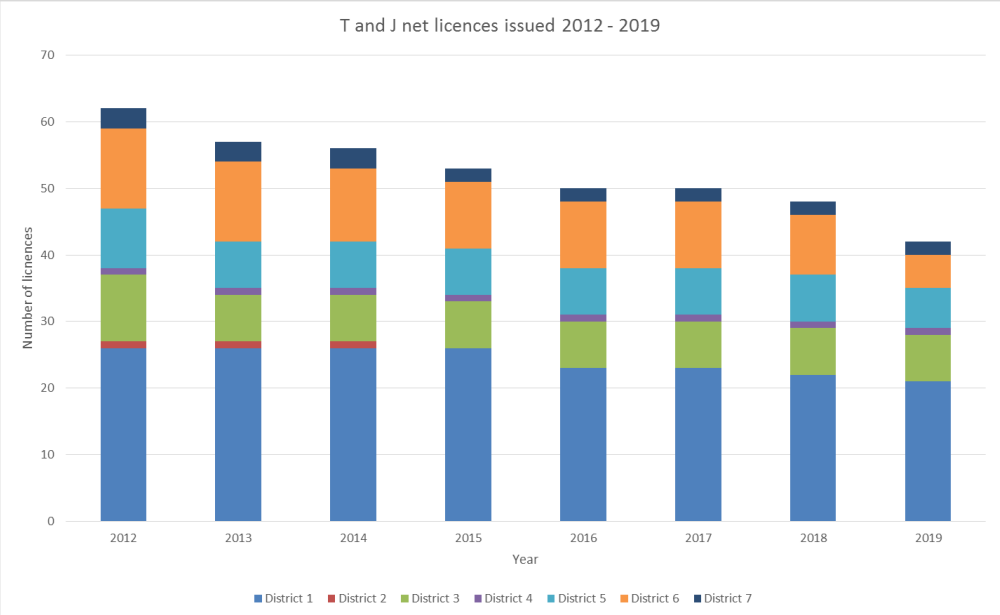

Figure 6. The number of T and J net licences issued by District 2012 - 2019

Since the extension of the NLO to the beach net fishery in 2012, the number of T net licences issued in Districts 1 & 2 has fallen by over 22% and the number of J net licences issued in Districts 3 to 7 has fallen by 40%.

The fishery is expected to continue to reduce over time as licensees retire and are not replaced.

6.2 Salmon catches in the net fishery

Net catches first began to be systematically recorded in 1952. Historical salmon catch records for the whole of the net fishery are shown in Figure 6 below.

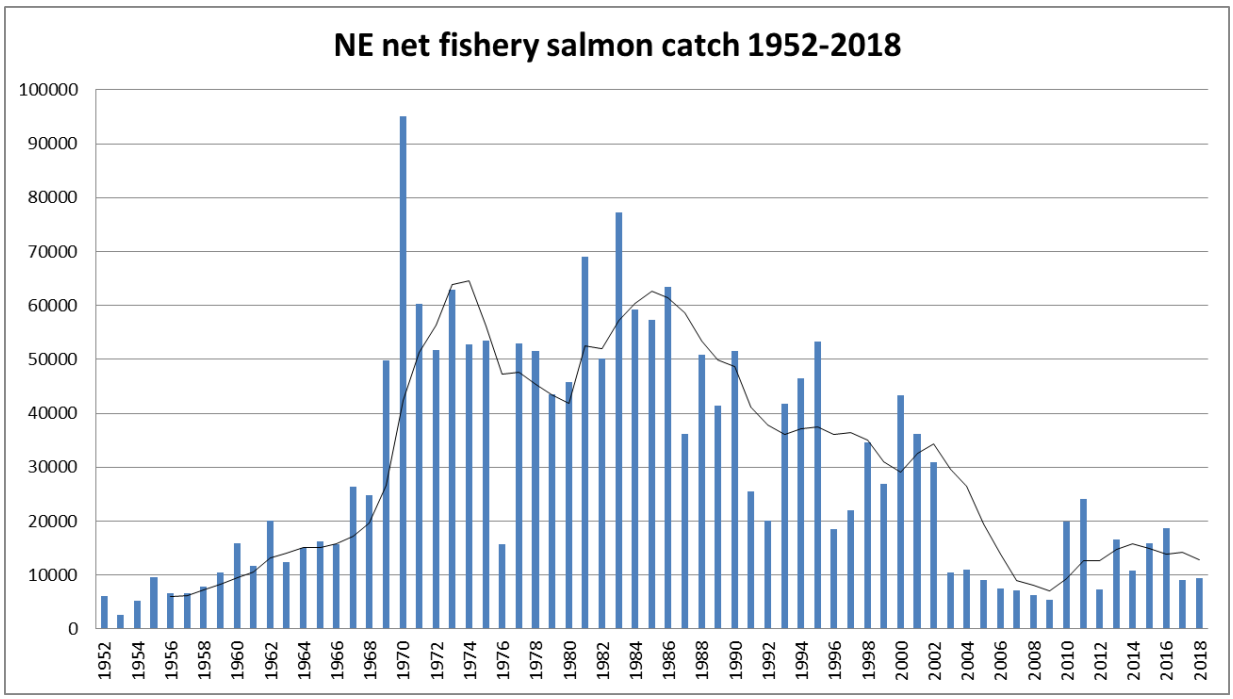

Figure 6. Historical salmon catches in the net fishery

Over this period, drift nets accounted for the majority of the salmon catch, which peaked at almost 95,000 in 1970, following the introduction of synthetic nets and increased participation in the fishery.

Salmon catches fell substantially following the drift net buy-out of 2003, decreasing from 30,980 salmon in 2002 to 10,427 in 2003. A number of fishermen who relinquished drift nets at this time were able to remain in the fishery by transferring to T nets, which had an impact on the pattern of catches in the fishery.

The proportion of salmon catch taken in the T and J net fishery increased since the 2003 buy-out of drift licences as the balance of fishing effort changed. The T and J net fishery catch exceeded the drift net catch for the first time in 2009, and again in 2012 and 2013.

Netting for salmon was prohibited under the provisions of the 2018 national byelaws, which came into force for the 2019 netting season, when the drift net fishery was closed.

Salmon net catches in the beach net fishery from 1993 to 2018 shown in Figure 7 below. The great majority, on average over 90%, of the beach net catch over this period is landed in District 1.

In District 1, T net catches averaged 5672 salmon over the 10 years 2009 to 2018. The average J net catch in Districts 3 - 7 combined over the same period is 426 salmon.

Since landing salmon was prohibited by the 2018 byelaws, the salmon net catch for 2019 is expected to be zero, since all salmon, whether alive or dead, must be returned.

The cumulative proportion of the salmon catch landed as the season progresses in each district of the fishery is shown in Table 2 and Figure 8 below, based on averaged catches from 2016 - 2018.

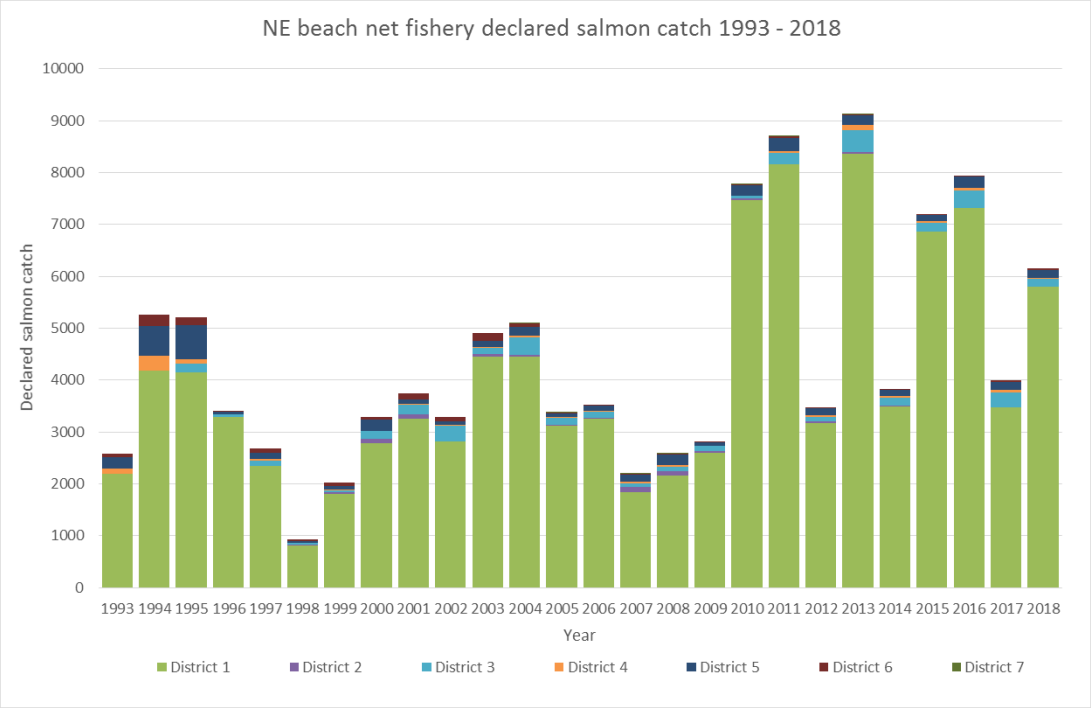

Figure 7. Salmon net catch in the beach net fishery 1993 to 2018

Salmon	April	May	June	July	August
D1	0.00	0.00	0.29	0.75	1.00
D3	0.00	0.00	0.23	0.81	1.00
D4	0.00	0.00	0.37	0.69	1.00
D5	0.00	0.00	0.18	0.70	1.00
D6	0.00	0.00	0.45	0.81	1.00
D7	N/A	N/A	N/A	N/A	N/A

Table 2. Cumulative proportion of salmon catch by district (2016-2018)

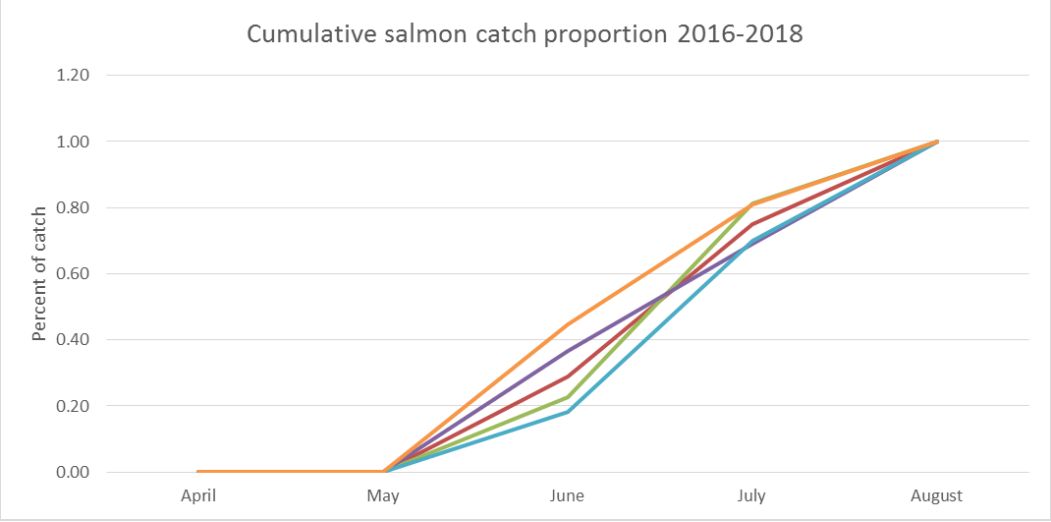

Figure 8. Cumulative proportion of salmon catch by district (2016-2018)

6.3 Sea trout catches in the beach net fishery

Historical sea trout catch records for the whole of the net fishery are shown in Figure 9 below.

The highest sea trout catch of 71,369 was recorded in 1989, with catches showing a downward trend from that point until 2007, after which time catches began to increase. The 2015 catch of almost 60,000 was the highest recorded since 1989. Since that time catches have fallen substantially, with the 2018 total net catch being 22,508.

The proportion of the total sea trout catch taken in T and J nets significantly increased from 2003, following the drift net buy-out and resulting reduction in fishing effort in the drift net fishery, and corresponding increase in beach netting effort.

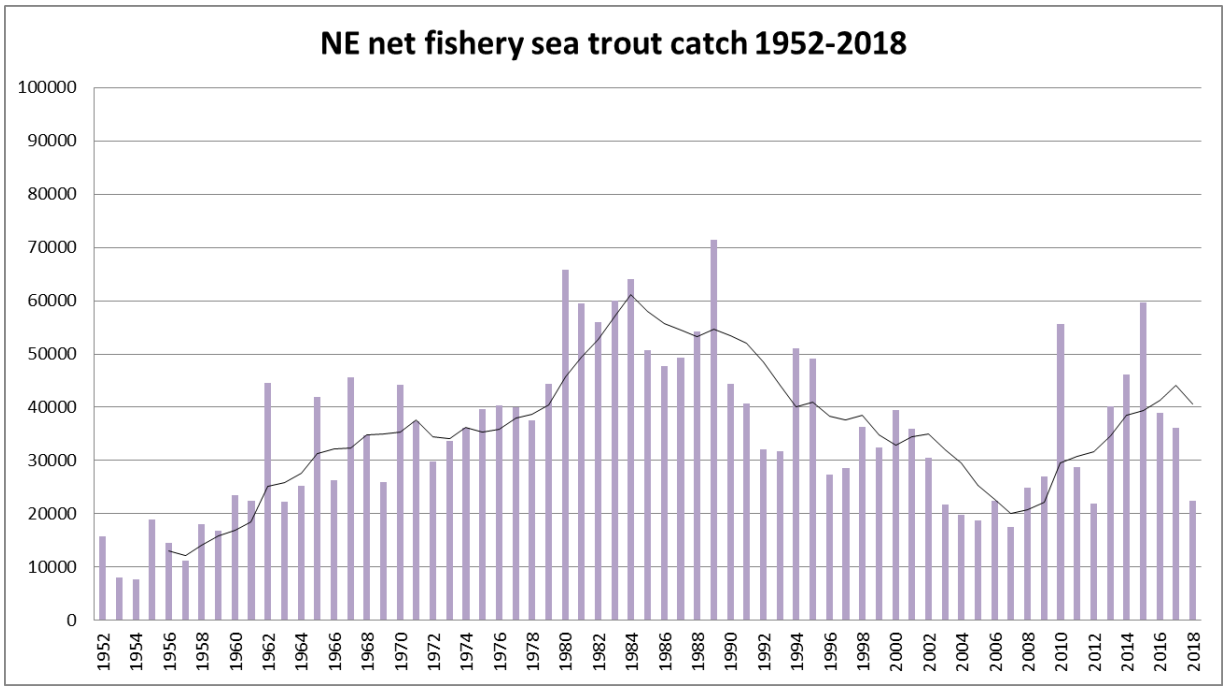

Figure 9: Sea trout net catches in the North East net fishery 1952 - 2018

With the closure of the drift net fishery, and the shortening of the netting season, particularly in District 1, the 2019 sea trout net catch is expected to be lower than in previous years.

More recent sea trout net catches from the beach net fishery are shown in Figure 10 below, broken down by District.

The cumulative proportion of the sea trout catch landed as the season progresses in each district of the fishery is shown in Table 3 and Figure 11 below, based on averaged catches from 2016 - 2018.

Sea trout	April	May	June	July	August
D1	0.00	0.07	0.46	0.88	1.00
D3	0.00	0.05	0.48	0.90	1.00
D4	0.00	0.06	0.53	0.89	1.00
D5	0.00	0.07	0.50	0.88	1.00
D6	0.00	0.08	0.56	0.86	1.00
D7	0.00	0.00	0.25	0.83	1.00

Table 3. Cumulative proportion of sea trout catch by district (2016-2018)

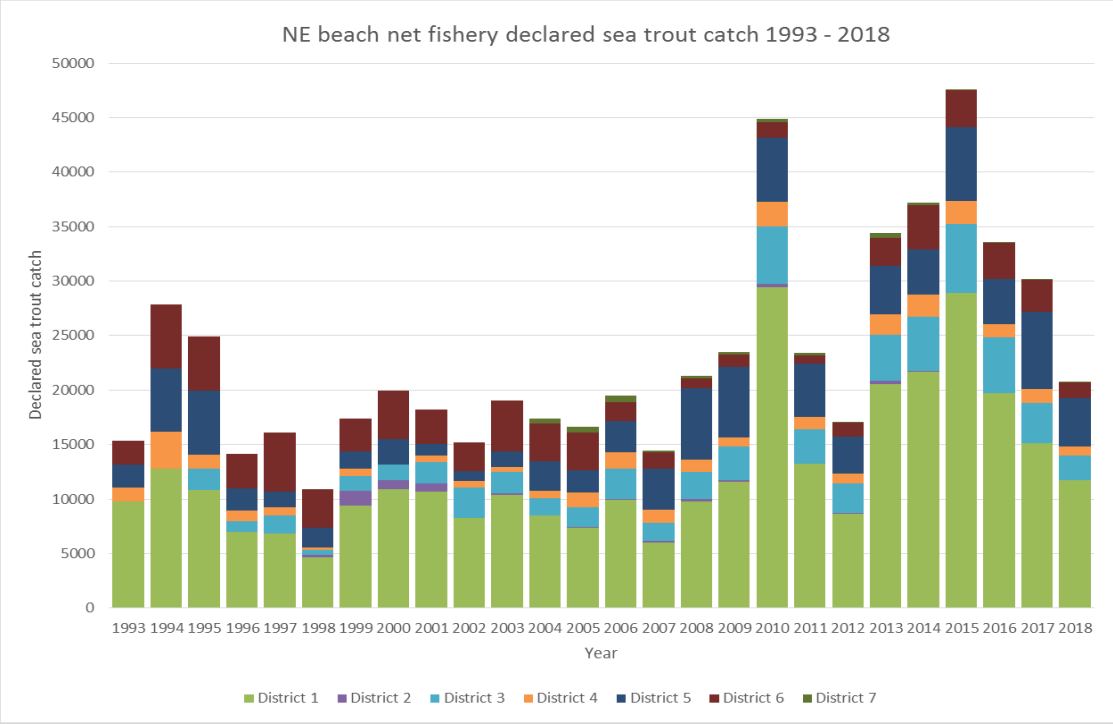

Figure 10. Sea trout net catch in the beach net fishery 1993 to 2018

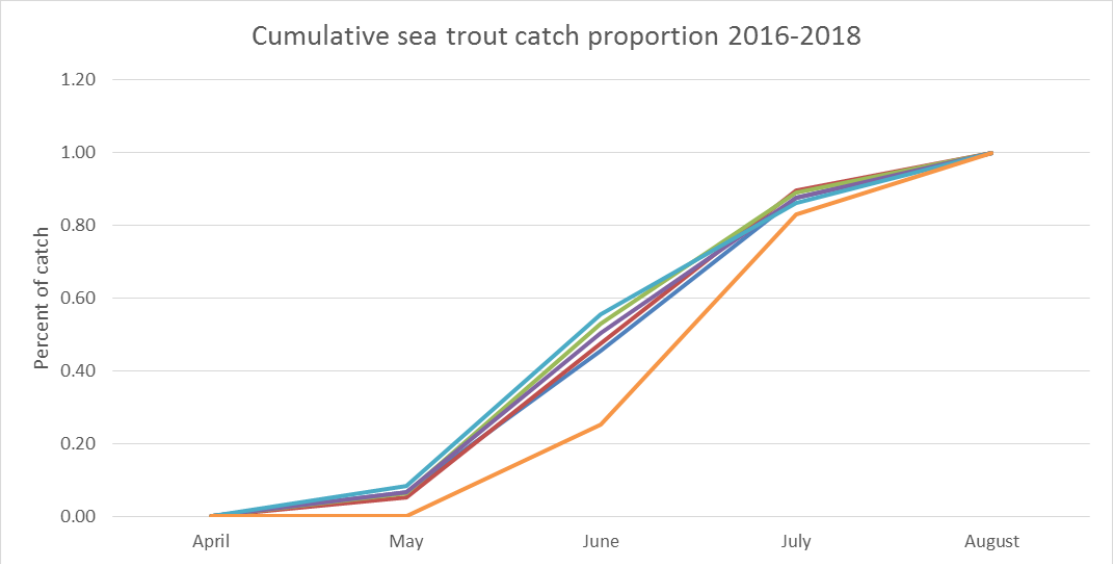

Figure 11. Cumulative proportion of sea trout catch by district (2016-2018)

Sea trout catches are far more evenly distributed than salmon net catches between different districts in the net fishery, making the possibility of a sea trout only fishery a viable alternative to a combined salmon and sea trout net fishery. T nets in District 1 account for the largest percentage of catches, averaging around 60% of the total beach net sea trout catch in recent years.

5.4 Proportion of salmon in the net catch

The average proportion of salmon and sea trout in the net catch for each District in recent years is shown in Figure 12 below.

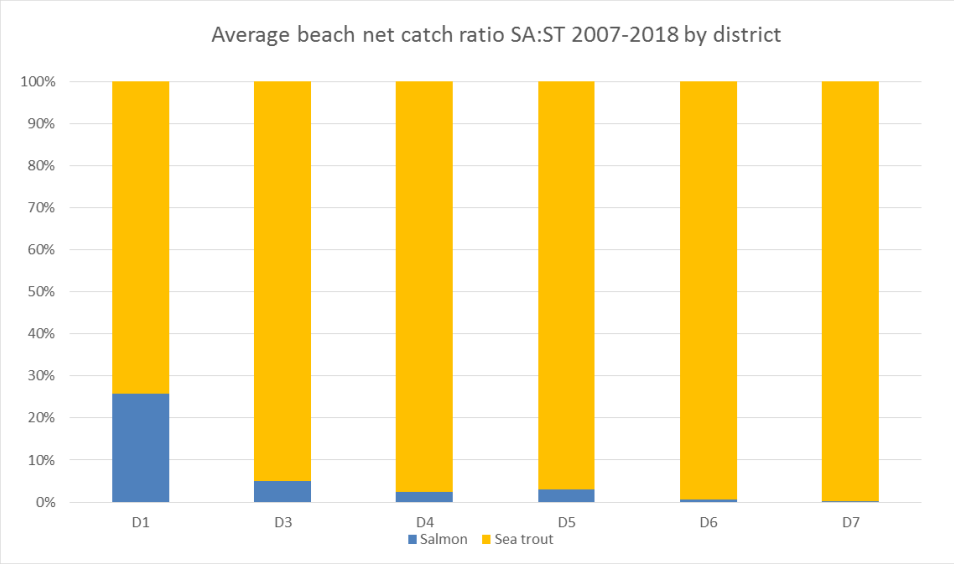

Figure 12. Proportion of salmon comprising the beach net catch in each District 2007 - 2018

Beach net catches are dominated by sea trout, with a much smaller proportion of salmon being intercepted. The salmon catch contribution declines from north to south in the net fishery, with the more southerly districts intercepting very few salmon.

On average, salmon comprise around 25% of the T net catch in District 1, falling to under 5% in District 3, 2-3% in Districts 4 and 5 and less than 1% of the total catch in Districts 6 and 7.

6. Modified net trials 2019

The results of this field trial are reported fully in a separate technical report and briefly summarised below.

Short videos showing field footage from the trial in the North East and in Yorkshire are available on the Environment Agency YouTube channel, with links provided from our online consultation page.

6.1 Trial overview

Between June and August 2019, the Environment Agency undertook field trials of modified designs of beach nets in the Yorkshire and North East coastal net fishery. These trials were designed to determine whether modified nets were able to catch sea trout preferentially to salmon.

Trial netting berths for modified T nets were established at three separate locations in the North East, at Alnmouth, Amble and South Shields. An additional trial berth for a modified J net was located at Filey Bay in Yorkshire.

The Agency developed four success criteria for the modified net trials, which are summarised below:

1. There should be no increase in the level of exploitation of sea trout in any district above recent historic levels.

2. An interception rate for salmon not exceeding 5% of the total sea trout net catch.

3. Minimal physical damage to enmeshed or entangled salmon.

4. Levels of immediate mortality of enmeshed or entangled salmon set at not more than 50 salmon over the whole of the trial period in the North East, and not more than 10 salmon in Yorkshire.

The trials provided a substantial amount of new data to better inform our understanding of the operation of modified designs of nets to advise the future management of the net fishery.

The data collected from these trials provides an assessment of net performance in a single year only, at a limited number of locations. Historic net catches confirm the fishery has significant inter-annual variation in catches, and therefore results should be interpreted with a degree of caution.

However, with this caveat, the information provided by the trials provides a good evidence base on which to evaluate the performance of the modified nets, and to inform future net fishery management.

The North East trial comprised 771 hours of netting in 87 separate netting events over an 11 week period. The data provided by logbook returns from licensed netsmen were validated by over 92 hours of independent fisheries observations and video surveillance of the operation of the nets by Environment Agency officers.

The trial in Yorkshire comprised a total of 14 netting events, over which 81 hours of netting were undertaken. The data provided by logbook returns from the trial berth were validated by over 36 hours of independent fisheries observations and video surveillance of the operation of the nets by Environment Agency officers.

6.2 Experimental design and data quality

The 2019 sea trout netting trials in both District 1 and in District 5 have provided a substantial amount of new data to better inform our understanding of the operation of modified designs of nets to advise the future management of the net fishery.

The data collected from these trials provides an assessment of net performance in a single year only, at a limited number of locations. Historic net catches confirm the fishery has significant inter-annual variation in catches, and therefore these results should be interpreted with a degree of caution.

However, with this caveat, the information provided by the trials provides a good evidence base on which to evaluate the performance of the modified nets, and to inform future net fishery management.

The data secured from logbook returns and from fisheries observations generally yielded differing results, with the exception of the Alnmouth berth, where results from both logbooks and observations showed close agreement.

Elsewhere, fisheries observations provided higher estimations of the proportion of salmon in the net catch, and higher catch rates for salmon than proportions recorded in logbooks.

A number of factors are likely to have contributed to these differences in assessment.

The difference between the percentages of salmon in the catch recorded in logbooks and in fisheries observations may reflect the fact that fisheries observations provide only a sub-sample of overall netting effort, covering 12% of the total time spent fishing.

Given the variable catches of salmon and sea trout across the whole trial period, the relative catch proportions observed during direct observations may not exactly replicate the catch proportions when considering the trial period as a whole.

In order to maximise the number of fish observed, the available fisheries observation monitoring effort was largely focused around the high tide, rather than across the whole of each day’s netting.

This is the period when the greatest proportion of the catch is usually netted. It is possible that salmon are over-represented in catches at this state of tide compared to other periods in the netting session.

Effort was also specifically focused on the earlier weeks of the netting trial, in order that any significant catches of salmon that had occurred could have been identified at an early stage and the trial, if necessary, brought to an early conclusion.

Licensees applied a different interpretation of ‘entangled’ to fisheries observers. Netsmen typically included fish physically enmeshed and which required their intervention to release, but excluded fish which were assisted in leaving the net, for example by being rolled over the head rope, but which they assessed would have been likely to escape the net without intervention if they had been left in-situ.

Fisheries observers included all salmon which were assisted in exiting the net, regardless of the degree on entanglement or whether it was thought likely salmon would have exited the net without assistance.

A further possibility is that netsmen under-reported their catches of salmon at times when fisheries observers were not present, although it must be stressed that there is no evidence of this occurring.

The trial in District 1 was extensive, totalling 771 hours netting comprised of 87 separate netting events over an 11 week period at three netting stations. The data provided by logbook returns was validated by over 92 hours of independent fisheries observations and video surveillance of the operation of the nets. There is general agreement between the results obtained from netsmen's logbooks, and directly from fisheries observations.

The trial in District 5 comprised a total of 14 days fishing, over which 81 hours of netting were undertaken. The data provided by logbook returns was validated by over 36 hours of independent fisheries observations and video surveillance of the operation of the nets.

As with the trial in District 1, there is broad agreement between the results obtained from netsmen's logbooks, and from fisheries observations. Although there are some differences in the data provided by logbooks and fisheries observations, the total number of salmon recorded by both methods is small, and the results from both methods of assessment are in general agreement.

6.2 North East net trial results

6.2.1 Catches

In the North East, a total of 3342 sea trout and 46 salmon were landed during the trial from logbook returns. Based on comparison with recent historic catches at the trial berth locations, this represents a 97% reduction in salmon catch, whereas sea trout catches were only reduced by around 30%.The recorded catch composition by month is shown in Figure 13 below.

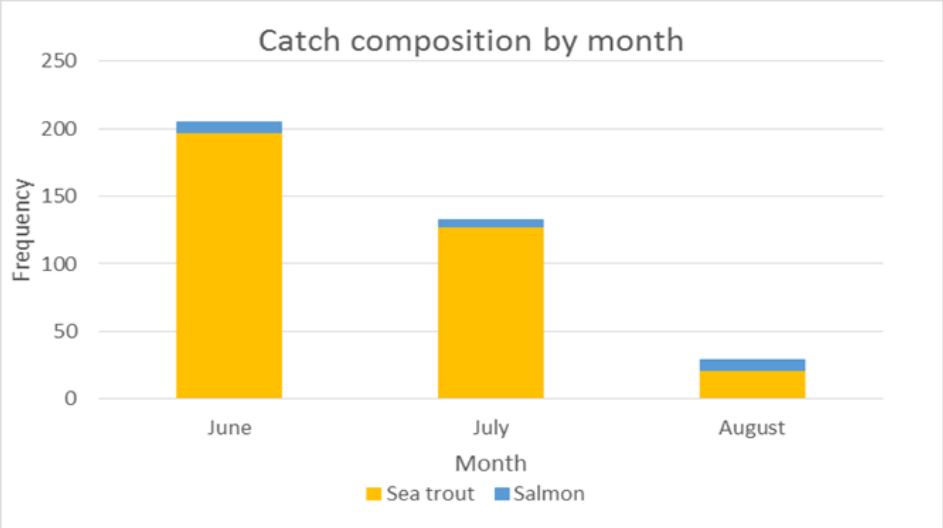

Figure 13. Catch composition in modified T nets by month from logbook returns

The percentage salmon comprised of the total catch observed during fisheries observations is shown in Table 4 by berth and Table 5 by month below.

Berth	% SA
Amble	9.68
Alnmouth	1.02
Shields	7.56
Total	**5.99**

Table 4. Salmon as a percentage of the total catch observed at each berth

Month	% SA
June	3.90
July	4.51
August	27.59
Total	**5.99**

Table 5. Salmon as a percentage of the total catch observed each month

6.2.2 Condition of salmon entangled

All 46 salmon entangled were released from the net and returned to sea with the minimum of delay. There were no immediate mortalities of salmon recorded, all fish were returned to the sea alive, generally with minimal to moderate scale loss.

6.2.3 Impact on salmon stocks

Given the absence of any confirmed mortalities, the low interception rate for salmon and the relative ease with which most salmon entangled in the net could be released, the trial has shown that in June and July it would be unlikely there would be any significant adverse impact on salmon stocks were modified T nets allowed to fish for sea trout over a longer season, including those stocks originating from rivers on the east coast of Scotland where salmon are designated as an interest feature of Special Areas of Conservation (SACs).

Salmon bycatch in August was higher, and sea trout catches low, providing a weaker case to extend the season beyond the end of July, although no mortalities were recorded in August.

The catch from the three participating berths has typically constituted around 40 to 50% of the total salmon catch in District 1 over the period 2014 to 2018.

Making the assumption that the salmon bycatch across the whole of District 1 would reflect this catch distribution, a bycatch of salmon for the whole District may be estimated at around 100 salmon over the same period.

Effort utilisation for the trial period was higher than full season comparison, largely because participating licensees elected to fish in periods of relatively low catches in order to secure a comprehensive dataset for the trial. A more typical level of fishing effort would be likely to produce a lower salmon bycatch.

6.2.4 Impact on sea trout stocks

The closure of the drift net fishery in 2018 and the substantial reduction in netting season in District 1 has substantially reduced levels of sea trout exploitation in the net fishery, which has reduce sea trout net catches in 2019.

Restoring part or all of the sea trout netting season would be likely to significantly increase exploitation of sea trout above the 2019 level, but given the modified design of T net allows a proportion of sea trout to escape the net through the open ends of the headpiece, not to the levels previously recorded in the historic net fishery.

Typical levels of effort utilisation in the net fishery would be likely to produce lower catches than in the trial period.

Catches during the trial were lower than recent average catches using a traditional net, by on average around 30%, although variable between berths, with the South Shields berth returning catches over 50% lower than the recent average catch of sea trout.

The maximum length of any extension to the net fishery in District 1 would be three months for 17 licensees.

6.3 Yorkshire net trial results

6.3.1 Catches

In Yorkshire, a total of 67 sea trout and 4 salmon were landed during the trial. Based on comparison with recent historic catches, salmon catches were around 74% lower than the recent average for this berth, with sea trout catches around 64% lower than average.

The recorded catch composition by month recorded in logbook is shown in Figure 14, and from direct fisheries observations in Figure 15 below.

The salmon catch represented 5.63% of the total net catch reported during the trial, and 10.3% of the catch observed by Environment Agency observers.

6.3.2 Condition of salmon entangled

Only four salmon were entangled during the net trial, three of which were returned with no recorded significant injuries. The fourth salmon entangled was intercepted by a seal and killed before it could be released.

These results indicate that salmon can be successfully released from the net with minimal injury, meeting this criteria. As with any design of net, seal predation may result in some mortality of entangled fish.

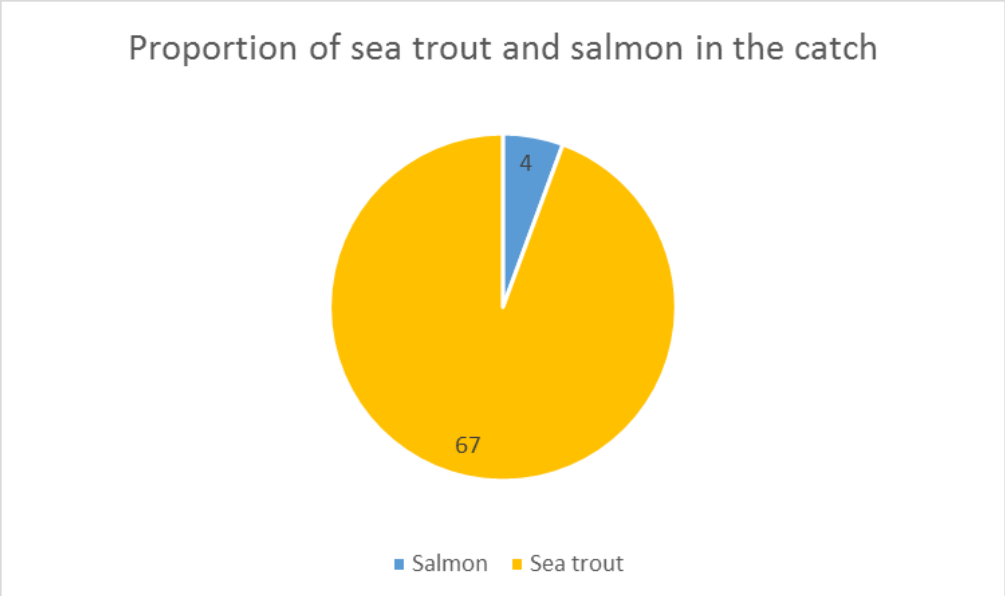

Figure 14. Proportion of sea trout and salmon in the net catch

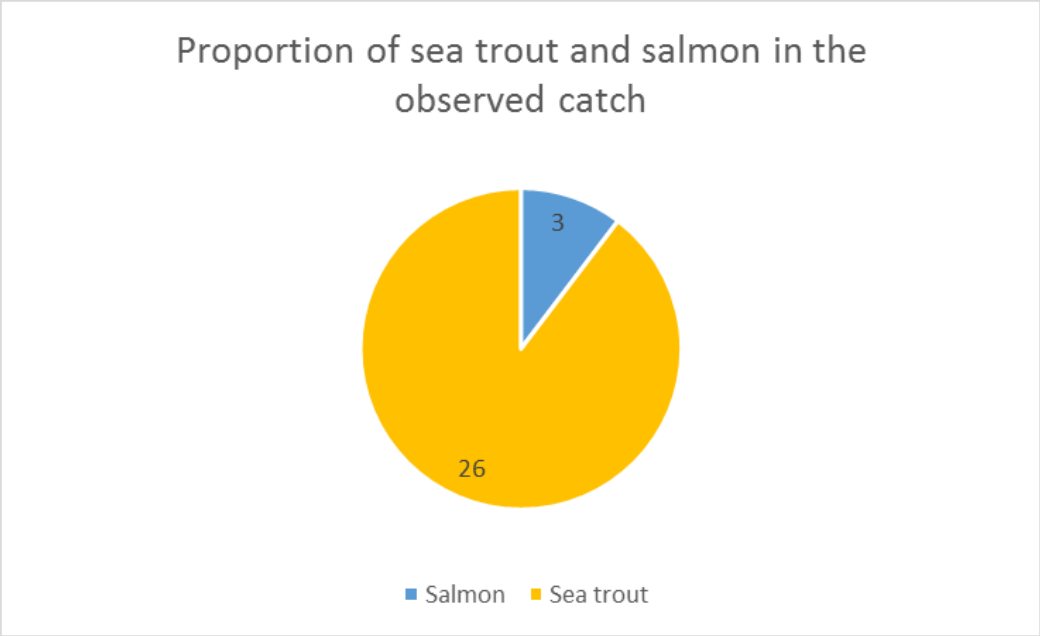

Figure 15. Proportion of sea trout and salmon in the observed catch

6.3.3 Impact on salmon stocks

As the trial employed a single berth in District 5, any assessment of the likely catch of salmon in the wider Yorkshire beach net should be treated with relatively low confidence.

However, given the low interception rate for salmon and the relative ease with which most salmon entangled in the net could be released, the trial results indicate it is likely there would be a minimal impact on salmon stocks were modified J nets allowed to fish for sea trout over a longer season, including those stocks originating from rivers on the east coast of Scotland where salmon are designated as an interest feature of Special Areas of Conservation (SACs).

6.3.4 Impact on sea trout stocks

Extending the sea trout netting season would increase exploitation of sea trout above the 2019 level, but given the modified design of J net is less effective at intercepting sea trout than the traditional design, not to the extent of the fishery prior to the introduction of the 2018 byelaws.

The catch reduction in the modified J net trial was approximately 65% lower than the recent average for the trial berth over the same period. However, in Yorkshire, the more limited nature of trial data and the variable netting end dates for different districts makes a numerical estimate of the impact of ext3ended netting on sea trout stocks uncertain.

The maximum length of any extension would be two months in District 3 (for seven licensees) and one month in Districts 4 and 5 (for seven licensees).

Given the 65% reduction in catches recorded in the trial, the sea trout catch would be likely to be lower than recent years were the season to be extended in Districts 3, 4 and 5.

6.3.5 Contribution to 2019 sea trout net catch

Catch returns for 2019 have not been finalised at the time of writing, but a provisional assessment has been made.

The provisional 2019 sea trout beach net catch is approximately 13.4K sea trout, of which 4,200 sea trout were caught in District 1 and 9,400 sea trout in Districts 3 to 7.

This compares to an average sea trout beach net catch of sea trout over the period 2014 to 2018 inclusively of 16.9K sea trout in District 1 and 13.6K in Districts 3 to 7.

Provisional 2019 sea trout catches by District are shown in Figure 16 below.

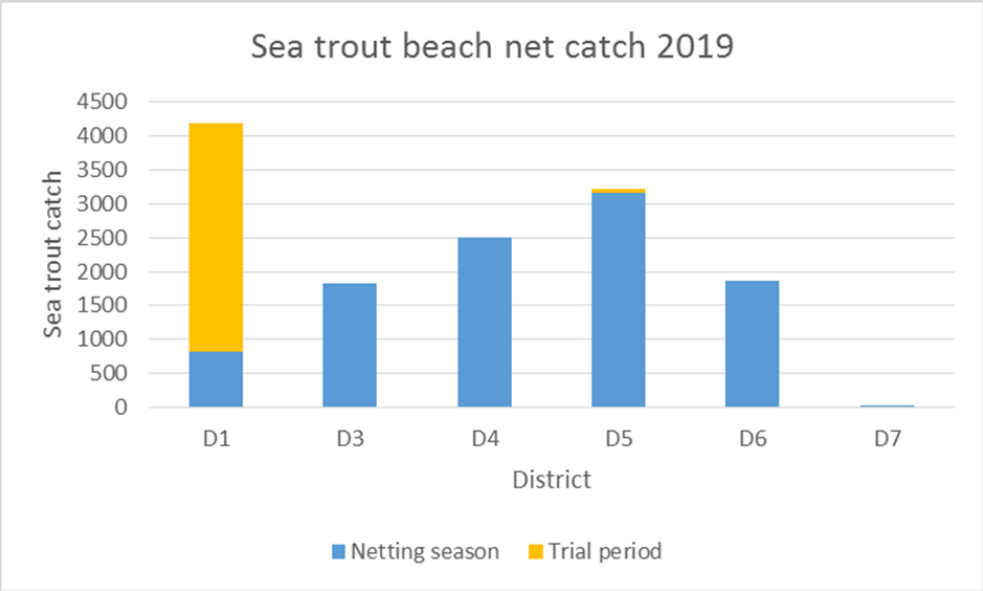

Figure 16. Provisional sea trout beach net catch 2019

Catches of sea trout from the three berths comprising the net trial in District 1 accounted for around 80% of the total sea trout catch in the district. The large proportion of the T net catch accounted for by the trial is as a function of the of 11 week duration of the trial, compared to the 9 week regular netting season, the timing of the trial when peak runs of sea trout are available to the fishery, and because the trial nets were located at the most productive berths in District 1.

Without the contribution of the net catch during the trial period in District 1, the sea trout catch for the district would have been less than 1000 fish in 2019.

Conversely, the Yorkshire trial comprised only 2% of the District 5 sea trout catch and 0.7% of the total J net sea trout catch. This is as a result of the trial comprising only a single net fishing for 4 weeks.

6.4 Conclusions from the trial

In both the North East and Yorkshire the trial results show that the modified designs of nets proved successful in intercepting sea trout whilst only entangling a small number of salmon, the great majority of which were returned with minimal damage or delay.

In the North East the modified net design of T net met or came close to meeting all trial criteria and entangled very few salmon. If this design of net were extended to the whole of the North East net fishery over an extended season, the impact on salmon stocks is assessed to be very low.

The impact on sea trout stocks is less certain, given the variable performance of the modified T nets at differing berths, but trial results in District 1 show an average reduction in catches of sea trout of around 30% and of around 65% in District 5.

In Yorkshire the evidence also indicates an extended sea trout fishery could meet the Agency's criteria, since only one salmon mortality was recorded and the net design met or came close to meeting all test criteria. If this design of net were extended to the whole of the Yorkshire net fishery over an extended season, the impact on salmon stocks is assessed to be very low.

Catches from both trials indicate an extension to the current sea trout netting season is likely to be economically viable.

Options for the future regulation of the net fishery should be further developed, based on the conclusions of this report and the latest assessment of the status of contributing salmon and sea trout stocks.

The most effective and appropriate means of extending the current netting season for sea trout should be further investigated, consistent with policy and carefully balancing our management objectives of providing vulnerable stocks with much needed added protection, while minimising the economic and social impacts of Agency regulations.

7. Performance of contributing stocks in England

7.1 Introduction

Salmon and sea trout from a large number of populations are exposed to the beach net fishery in Yorkshire and the North East.

The performance of the stocks of salmon and sea trout in England exposed to the beach net fishery is summarised below. The performance of the stocks in Scotland is set out in Section 8 following.

Two principal sources of data have been used to assess the status of salmon and sea trout stocks in each catchment. These are declared rod catch and compliance with Management Objective, where one has been established.

Declared rod catch has been used to represent the performance of sea trout stocks. For English stocks, a classification using the sea trout rod fishery performance assessment tool has also been made.

For salmon, compliance with egg deposition target and rod catches have been used to illustrate the performance of salmon stocks.

Where Environment Agency operated fish counters are present, we have also presented and considered fish counts and estimates of returning stock size.

An annual programme of juvenile salmonid electric fishing surveys has been undertaken since 1991 across catchments in Yorkshire and the North East. These surveys provide information on the spatial distribution and numbers of juvenile salmon and trout. The surveys have most commonly been single run, semi-quantative surveys which provide minimum density estimates.

Whilst useful in providing a general overview of the distribution of spawning activity at a catchment scale, and the degree of habitat utilisation at a reach scale, results from electric fishing surveys for juvenile salmonids show considerable inter-annual variation both within and between sites.

Previous analyses show there are no consistent long terms trends evident in these data, and that juvenile salmonid densities do not reliably predict future smolt output or returning adult run size.

Therefore, electric fishing survey data are not considered further in this report.

7.2 Declared rod catches

All salmon and sea trout anglers in England are legally required to submit an annual catch return to the Environment Agency under the Salmon and Freshwater Fisheries Act 1975.

The declared catch provides an assessment of the number of rod caught salmon and sea trout for each river. For the purposes of this report, rod catch data from 1952, which is the date from which

we have continuous data on all catchments, is considered, and provides sufficient historical context.

Rod catch may be used to provide an indication of stocks size by assuming there is a relationship between the size of the salmon or sea trout population returning to the river in each year, and the declared rod catch of each species.

There are a number of assumptions and uncertainties associated with this approach, since the relationship between the sizes of the salmon or sea trout runs returning to each river and the rod catch in that river is influenced by a number of factors.

1. The level of fishing effort, influenced by changes to regulations, access to opportunities to fish, angler perceptions of likely success and other factors.

2. The ease by which fish may be caught, influenced fishing conditions, tackle regulations, season length and the expertise of individual anglers.

3. Errors in reporting the declared rod catches, including under-reporting and illegal fishing.

4. Differential exploitation rates for early and later running fish and changes to fishery regulation changes.

5. Therefore, estimates of the size of the salmon and sea trout run in each catchment based on rod catch must be treated with caution. These limitations notwithstanding, rod catches remain a useful indicator of stock size, and particularly in trends or changes in stock size over time.

7.3 Conservation Limits in England

To address some of the issues regarding the use of rod catch statistics as an indicator of stock size, Conservation Limits (CL) have been developed for the principal salmon rivers in England and Scotland. At present, Conservation Limits have not been developed for sea trout due to their more complex reproductive strategy, whereby sea trout smolts are produced from resident brown trout populations as well as from migratory trout.

For each of the Principal Salmon Rivers in England, Conservation Limits have been developed. The Conservation Limit is considered to be the minimum safe level of spawning salmon for each river. By regularly failing to reach this limit, the risk of that river's salmon stock suffering serious decline greatly increases.

These Conservation Limits are expressed as the number of salmon eggs deposited by returning fish, and are based on catchment specific characteristics such as catchment area, gradient and other features.

This method involves estimating the numbers of salmon returning to spawn in a river each year, and hence the number of eggs deposited, and assessing this number against the number of eggs comprising the Conservation Limit.

Because salmon stocks naturally vary from year to year, the Environment Agency aims to ensure that stocks meet the Conservation Limit in four out of five years on average; this is the Management Objective.

To meet this, the average level of a stock typically needs to be around 40% above the Conservation Limit (this higher level is termed the Management Target).

It is also important to look at the trend for a particular stock, whether it is stable, improving or deteriorating. Stocks are therefore classified according to whether, on the basis of the trend over the past 10 years, they are likely to meet the Management Objective in five years' time.

This system is used because it gives an early warning of where a river's salmon stock will be, if current trends are maintained. On the basis of this annual compliance assessment, stocks are allocated to one of four categories based on the likelihood of meeting the Management Objective

Annual compliance with the Conservation Limit is estimated using egg deposition figures. These are derived from returning stock estimates, where such data are available, but for rivers without

adult fish traps or fish counters, the usual procedure for estimating egg deposition involves calculating run size from rod catch, using estimates of rod exploitation.

The categories for each salmon population are as follows:

1. Not at risk – greater than 95% probability of meeting the management objective;
2. Probably not at risk – between 50% and 95% probability of meeting the management objective;
3. Probably at risk – between 5% and 50% probability of meeting the management objective; and
4. At risk - less than 5% probability of meeting the management objective.

The use of Management Targets and Conservation Limits to provide an objective assessment of the performance of salmon populations is a well-established, nationally consistent approach. Our assessments of salmon stocks are based on internationally accepted methods and are reviewed to ensure they provide us with the most accurate estimates of stock performance possible.

7.4 Sea trout fishery performance assessment

An assessment of the status of sea trout stocks is made using rod fishery performance as an indicator of stock size. As explained in 6.1 above, rod catches do not necessarily represent stock performance, and are influenced by a range of other factors.

It is therefore necessary to interpret this classification with some caution, but the approach provides a useful indicator of stock size and trends in stock performance.

The assessment of sea trout fishery performance is based on two criteria - trend in catch per unit effort (CPUE) in the last 10 years and current CPUE relative to the previous 10 years. The results have been divided into 4 risk categories, as with salmon populations:

5. 1. Not at risk
6. 2. Probably not at risk
7. 3. Probably at risk
8. 4. At risk

There is no forward prediction for status in five years' time as there is with salmon. The assessment of sea trout fishery performance is designed to give an early warning about potential problems and assist with considering whether any further management actions, including exploitation controls, are required.

7.5 Fish Counters

The Environment Agency has operated a network of fish counters on the region’s salmon rivers for a number of years.

These counters provide an assessment of the number of returning adult salmon and sea trout, which provides a minimum estimate of upstream migration that is independent of estimates derived from rod catches.

Fish counter data are available for the rivers Tyne, Wear and Tees.

On the river Tyne a fish counter has operated at Riding Mill since 1996. In 2004, underwater video cameras were installed to allow the species identification of fish passing upstream and to validate results from the fish counter.

Restriction on the use of the video system during high flows and in periods when the river water is turbid or highly coloured limit its application. Nevertheless, it is possible to apportion the returning run of migratory salmonids to species using this system.

The Tyne is the only river for which a separate estimate of the number of returning adult salmon and sea trout is available. For the other rivers, a combined count of salmon and sea trout is generated.

On the river Wear fish counter data are available from 1995 from the fish counter in Durham City. The counter gives a total combined upstream count of salmon and sea trout. There are no data available for 2004 and 2006 due to operational difficulties experienced during those years resulting in the counter not being in operation.

A fish counter on the River Tees has been operating at the Tees Barrage at the tidal limit since 2011. There are several route by which adult salmon and sea trout can pass upstream at the barrage, of which the fish pass containing the counter is one. Therefore, the counter only monitors the upstream migration of salmon and sea trout through the fish pass and provides a minimum count of returning fish.

Additional upstream migration routes exist through the main barrage gates, canoe slalom, turbine fish pass and the navigation lock.

To help fish migrate, the Environment Agency and the Canal and River Trust keep the main barrage gate open as much as possible, which improves fish passage but reduces the counting efficiency of the fish counter.

7.6 Summary of the performance of English stocks

Details of the rod catches, salmon spawning target compliance, sea trout fishery performance and where available fish counter information for individual English stocks exposed to the North East Coast sea trout net fishery are detailed in Appendix 1.

A summary of the performance of these stocks is given below:

7.6.1 Performance of salmon stocks and forecast in 2023

The performance of salmon stocks exposed to the beach net fishery in Principal Salmon Rivers in England in recent years, and the forecast performance in 2023 is summarised in Table 4 below:

River	Salmon Compliance Assessment			
	2016	2017	2018	Predicted 2023
Coquet	Probably at Risk	Probably at Risk	Probably at Risk	Probably at Risk
Tyne	Probably not at risk	Probably not at risk	Probably not at risk	Probably not at risk
Wear	Probably not at risk	Probably not at risk	Probably not at risk	Probably not at risk
Tees	At risk	At risk	At risk	At risk
Yorkshire Esk	Probably at risk	Probably at risk	Probably at risk	Probably at risk

Table 4: Current and predicted performance of salmon stocks

None of the stocks exposed to the beach net fishery are classified as 'Not at Risk'. The rivers Tyne and Wear have the highest and second highest salmon rod catch in England respectively, and are likely to have a harvestable surplus of salmon.

Stocks in the Tees, Esk and Coquet present more of a concern, and recent compliance with their respective Conservation Limits indicates these rivers will benefit from the prohibition of exploitation in the coastal net fisheries introduced from 2019.

The beach net fishery also exploits stocks from smaller and recovering rivers, including the River Aln in Northumberland and the Yorkshire Ouse system, notably the river Ure.

7.6.2 Performance of sea trout stocks

The sea trout fishery performance in these rivers for the last three years for which assessments are available is show in Table 5 below.

River	Sea Trout Fishery Assessments		
	2016	2017	2018
Coquet	At risk	At risk	Probably at risk
Tyne	Probably at risk	Probably at risk	Probably not at risk
Wear	At risk	Probably at risk	Probably at risk
Tees	Not at risk	Probably at risk	Probably at risk
Yorkshire Esk	Probably at risk	Probably at risk	Probably at risk

Table 5. Current and recent performance of sea trout stocks

Latest assessments indicate the Coquet, Wear, Tees and Yorkshire Esk sea trout stocks are Probably at Risk.

Rod catches have shown a marked downward trend, falling to historically low levels on the Aln, Coquet and Wear. The Tyne is assessed as Probably not at Risk, although the rod catch also shows a downward trend since 2010.

8. Performance of contributing stocks in Scotland

As described above, salmon and sea trout from a large number of populations are exploited by both beach (T and J) and drift nets in the North East net fishery.

Scottish salmon rivers which contribute to the North East coastal net fishery include the Tweed, Forth, Tay, South Esk, North Esk and the Aberdeenshire Dee. Contributions are made from smaller rivers within these Districts and in smaller numbers from rivers further north, including the rivers Spey and the Deveron.

The performance of contributing stocks in Scotland is summarised below.

Two principal sources of data have been used to assess the status of salmon and sea trout stocks in each catchment. These are declared rod catch and compliance with the Conservation Limit. Data have been provided via the Scottish Government website under a UK Open Government Licence (OGL).

Declared rod catch has been used to represent the performance of sea trout stocks contributing significantly to the North East net catch, which are confined in Scottish rivers to the River Tweed sea trout population only.

8.1 Declared rod catches

Salmon and sea trout rod catch data are obtained from returns made in response to an annual questionnaire sent to the proprietors or occupiers of salmon and sea trout fisheries under the provisions of the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003.

The same caveats and assumptions set out above apply to rod catch data secured in Scotland.

8.2 Conservation Limits in Scotland

The performance of each salmon stock is assessed in accordance with the same principles as in England, but uses a different methodology. Stock performance is assessed by setting an egg deposition requirement for the stock and estimating whether or not this requirement is met. As recommended by NASCO, the egg requirement is set to maintain the sustainability of a stock, rather than maximise juvenile output.

The numbers of salmon eggs estimated to have been deposited is used as the basis for assessment to account for changes through the season and over the years in biological characteristics such as size of the fish or sex ratio of the stock.

Assessments are undertaken for each river for each of the most recent five years to calculate the percentage chance that the egg requirement has been reached for each of the last five years, and used to determine the grade for each river. Rather than a simple pass or fail, stocks are allocated to one of the following three grades, each with its own recommended management actions:

Grade 1. At least an average chance of 80% that the egg requirement has been met over the past 5 years. Exploitation is sustainable therefore no additional management action is currently required. This recognises the effectiveness of existing non-statutory local management interventions.

Grade 2. An average chance of 60-80% that the egg requirement has been met over the past 5 years. Management action is necessary to reduce exploitation; mandatory catch and release will not be required in the first instance, but this will be reviewed annually.

Grade 3. An average chance of less than 60% that the egg requirement has been met over the past 5 years. Exploitation is unsustainable therefore management actions required to reduce exploitation for 1 year i.e. mandatory catch and release (all methods).

8.3 Summary for Scottish stocks

Details of the rod catches, and compliance with conservation limit for salmon for individual Scottish stocks contributing to the North East Coast net fishery are detailed in Appendix 2.

The performance of contributing Scottish salmon and sea trout stocks is summarised below.

8.3.1 Performance of salmon stocks

Of the largest of the east coast Scottish salmon rivers contributing to the North East coast net fishery, the Tweed, Tay, North Esk and Dee, are assessed as Grade 1 for 2020 and therefore likely to meet their conservation limit over a 5-year period with no additional management action required.

A number of smaller salmon populations known to be contributing to the net fishery are in less favourable condition, with 12 of the contributing salmon populations assessed as Grade 3 for 2020, meaning likely compliance with their spawning target is uncertain and current exploitation is unsustainable, requiring action is required to reduce exploitation to zero. Six the salmon stocks have deteriorated in grading since 2019.

The performance of the contributing salmon stocks in Scotland is shown in Table 7 below.

River	River Grading				Change
	2017	2018	2019	2020	
Tweed	1	1	1	1	-
Almond	3	3	3	3	-
Avon	3	3	3	3	-
Carron (Granegmouth)	3	3	3	3	-
Devon	3	3	3	3	-
Forth	2	2	2	2	-
Leven (Fife)	3	3	3	3	-
Teith	1	1	1	2	↓
Tyne (Scotland)	3	3	3	3	-
Earn	2	3	2	3	↓
Eden	2	3	3	3	-
Tay	1	1	1	1	-
South Esk	1	2	1	2	↓
North Esk	1	1	1	1	-
Carron Water	2	3	3	3	-
Cowie Water	3	3	3	3	-
Dee	1	1	1	1	-
Ugie	3	3	3	3	-
Thurso	1	1	1	1	-
Spey	1	1	1	1	-
Ness	3	3	1	2	↓
Conon	1	1	1	1	-
Deveron	1	2	1	2	↓
Don	2	3	3	3	-
Findhorn	1	1	1	1	-
Forss Water	1	2	1	1	-
Halladale River	1	1	1	1	-
Helmsdale	1	1	1	1	-
Borgie	1	1	1	1	-
Naver	1	1	1	1	-
Brora	1	3	1	1	-
Beauly	2	3	1	1	-
Berriedale	1	3	1	2	↓
Shin system	2	1	1	1	-

Table 7. Performance of Scottish salmon populations exposed to the beach net fishery

8.3.2 Performance of sea trout stocks

Sea trout from the River Tweed catchment contribute to catches in the North East coastal net fishery. Sea trout rod catches for the Tweed are shown in Figure 17 below. Catches showed an upwards trend from the 1950's until 2010.

Since that time, rod catch have shown a declining trend, with the 2018 rod catch of 775 being the lowest since 1984.

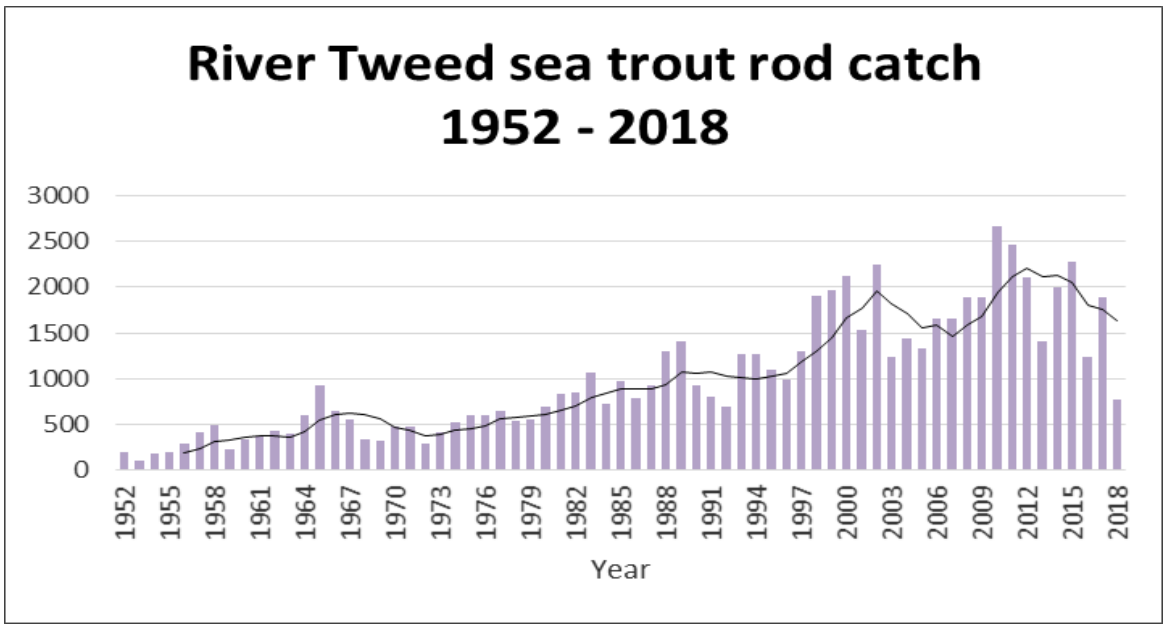

Figure 17. Tweed sea trout rod catch

9. Impact on protected sites and species

The potential exists for coastal salmon and sea trout netting activities to impact on protected sites and species. These are briefly described and assessed below.

In 2012 when the current NLO was confirmed, we undertook a formal Habitats Regulations Assessment which concluded there was no potential for significant adverse impact, either alone or in combination, on any designated sites or species, with the exception of Flamborough Head and Bempton Cliffs Special Protection Area (SPA).

At that time we completed an Appropriate Assessment to consider impacts on the bird species designated under the provisions of the SPA - Puffin *Fratercula arctica*, Razorbill *Alca torda*, Guillemot *Uria aalge*, Herring Gull *Larus argentatus*, Gannet *Morus bassanus*, and Kittiwake *Rissa tridactyla*.

Prior to undertaking the 2019 trial of modified designs of T and J net, we undertook a second Habitats Regulations Assessment. This concluded there was no potential for significant adverse impact, either alone or in combination, on any designated sites or species from the trial of modified nets.

In the event that any extension of the current net season were to be recommended, this would be subject to another Habitats Regulations Assessment

9.1 SAC rivers designated for Atlantic salmon

Five salmon populations known to be historically exploited by the North East coastal net fishery are designated as an interest feature in Special Areas of Conservation (SACs).

The most recent condition assessment for these salmon populations were reported in 2005, and are given in Table 5 below together with the latest Conservation Status Assessment.

SAC Name	Location	Condition Assessment	2020 Grade
River Dee SAC	Scotland	Favourable maintained	1
River South Esk SAC	Scotland	Unfavourable recovering	2
River Tay SAC	Scotland	Favourable maintained	1
River Teith SAC	Scotland	Unfavourable recovering	2
River Tweed SAC	England/Scotland	Unfavourable recovering	1

Table 5. Condition Assessment for salmon in SAC rivers (2005) and 2020 grading

Given the length of time since the condition assessments were reported, these are primarily included for completeness. The Conservation Status Assessments for 2020 above provide a more recent assessment of the current status of salmon populations in these SACs, and in other salmon populations.

It is very likely there would be no significant effect, either alone or in combination from any extension to the sea trout netting season on salmon populations designated in the above SACs.

9.2 Impact on Flamborough Head and Bempton Cliffs SPA

In the mid to late 2000's, it became apparent that large numbers of guillemots and razorbills were being fatally caught in J nets fishing for salmon and sea trout in Filey Bay during the summer months.

In response, the Environment Agency, working in partnership with Natural England and the Royal Society for the Protection of Birds (RSPB) implemented regional fisheries byelaws and a Code of Conduct to introduce measures to reduce seabird bycatch in Filey Bay in 2010.

The byelaws were introduced to avoid significant disturbance or deterioration to the Flamborough Head and Bempton Cliffs SPA and local seabird populations, whilst maintaining a viable salmon and sea trout fishery.

The byelaws require netsmen, during the month of June, attend their nets at all times, not leave nets out overnight (between 9.00pm and 5.00am), use high visibility multifilament nylon material in the leader of the net and if the headpiece of the net is made of monofilament material it must not exceed 70m in length.

At any time during the fishing season byelaws also require the netsmen to remove any seabirds caught in their net as quickly as possible and with the least possible injury; also to keep a record of the number of each species of seabird caught in the net and the number of sea birds released alive.

During 2010 and 2011 netsmen were required to report any bird fatalities and hand over any dead birds for disposal.

Additionally, throughout the fishing season all licensees must take reasonable steps as outlined in the Code of Conduct to make sure that the use of the net does not result in the death of sea birds.

The Code of Conduct requires the netsmen to attend the net at all times when there are significant numbers of birds in the vicinity and if a significant number of birds are being caught in the net to take preventative action. It also requires the netsmen to undergo training in the safe removal of birds from the net.

Our Appropriate Assessment in 2012 concluded that the number of net licences fishing in District 5, which includes the Flamborough Head and Bempton Cliffs SPA, should be reduced from 14 to 8. This reduction was implemented as part of the 2012 Net Limitation Order.

Natural England, as the statutory nature conservation body, measures the condition of the site's designated features at regular intervals. Although no specific condition assessments have been

undertaken, a full seabird colony count was completed during summer 2017. This was the first full colony count to be undertaken since 2000.

The Annual Report for 2017 for the SPA records that significant changes were recorded in the seabird population since the 2000 count:

Gannet numbers have increased by 425% to 13,392 pairs, guillemot and razorbill populations have also increased significantly, with 121,754 and 40,506 breeding individuals counted respectively.

In a pre-season rafting count, puffin numbers were estimated to be around 2,879 individuals.

Despite recent losses recorded in the kittiwake population, it is thought that numbers have increased slightly to 51,535 pairs.

The RSPB worked with individual fishers to trial innovative seabird deterrent techniques at the nets and an independent consultant monitored compliance with the byelaw from 2009 - 2015.

Preliminary results indicate that overall seabird bycatch reduced by 85% from 2009 and, of those birds that were caught in fishing nets, 60% were released alive in 2015.

Analysis has found that management measures, such as maintaining presence at the nets and the prohibition of leaving nets to fish overnight, have been important in reducing seabird bycatch, alongside the work of individual fishermen.

As a result of improved regulation and fishing practices, seabird mortalities in J nets in Filey Bay have been reduced to negligible levels in recent years.

We conclude there would be no significant effect, either alone or in combination from any extension to the sea trout netting season on bird species designated in the SPA.

9.3 Impact on other designated sites and species

The potential exists for adverse effect, either directly for example through entanglement in nets or physical damage to the seabed during deployment or indirectly through disturbance to species.

In 2012 and 2019 the Habitats Regulations Assessments concluded there was no potential for significant adverse impact, either alone or in combination, on designated sites or species.

Since 2012 time the fishery has reduced from 62 licences in 2012 to 42 licences in 2019, and the drift net fishery has been closed.

Therefore, it is very likely there would be no significant effect, either alone or in combination from any future extension to the sea trout netting season on any other designated sites and species.

10. Socio-economic evaluation

10.1 Assessing the value of the beach net fishery

In 2018, as part of a national salmon and sea trout byelaw review, the Environment Agency commissioned an economic evaluation of the net fishery from Amec Foster Wheeler. This study estimated an average gross income per licensee per season of around £25K for T netsmen and approximately £7K in the J net fishery.

It should be noted that these average values may not reflect the individual income of licensees, some of whom expend a relatively low level of effort, whilst others utilise a high proportion of their available fishing time.

A previous Environment Agency study of 2012 yielded similar results using estimated first sale values and reported catches. The average estimated first sale incomes to each beach net licensee was £10.3K and ranged from £3K to £39.5K

This study showed costs and overheads incurred in operating in the fishery amount to between £2000 and £8,000, average £5,900.

Costs to licensees include licence duties, insurance, harbour fees, fuel, nets and net repairs, boat maintenance and boat licences and transport.

Overheads were reported in 2012 as ranging from £2K to £8K per licensee, with an average cost of £6.4K.

It should be noted that many licensees work with one and sometimes two endorsees who receive payment, which is not reflected in the estimates above.

Net licence holders are regarded as an important source of business to local fish merchants, chandlers, boatyards and suppliers, and help to sustain the local fishing industry.

The range of economic influence of the net fishery extends beyond the local community and includes fish merchants, large wholesalers and a range of retail outlets before the fish finally reaches the consumer.

This means that the total economic value of the fishery is substantially greater than that estimated for point of first sale value (netsman to fish merchant).

There is not a single supply chain for every fish landed and different netsmen sell though different routes. Additionally, fish are sometimes sold directly by netsmen to retail or hospitality outlets at a premium.

10.2 Potential economic benefit of extending the sea trout netting season

The total weight of sea trout landed during the trial in District 1 was 11104lbs (5047kg), and 288lbs (131kg) in District 5.

Taking a representative first sale value for whole fresh sea trout of £10 per kg, the total value of the sea trout catch was approximately £50.5K in District 1 and approximately £1.3K in District 5.

Most overheads and outgoings incurred in order to operate within the beach net fishery, including maintenance and operation of a boat, net purchase, replacement and repair, insurance and harbour duties are fixed costs, which would not increase in the event of the sea trout netting season being extended. Therefore, any extension to the sea trout netting season using modified nets would be likely to provide an economic benefit participating licensees.

The closure of the drift net fishery for 2019 and the beach net fishery for salmon has resulted in an uplift in first sale values for sea trout, as demand increases in response to the lack of wild salmon available to the market. This increase will improve the economic viability of the sea trout net fishery.

The level of catches in modified nets during the trial and the circumstances of the beach net fishery indicate an extension of the netting season for sea trout would be economically viable, together with existing fishing opportunities in the existing netting season.

10.3 Social, heritage and experience values

Commercial fishing is widely considered to contribute to tourism in coastal communities, either from the value people derive from watching the boats and unloading of the catch or the fact that fresh fish and shellfish can be bought locally and in the enjoyment of eating locally caught produce.

Coastal towns such as Amble, South Shields and Filey have a strong fishing heritage and other coastal communities continue to have a fishing brand as part of their attraction to tourists.

However, the degree to which netting for sea trout might support tourism, in light of the wide range of other fishing activities and tourist attractions in coastal locations is unclear.

Whilst there is a strong tradition and heritage of fishing along the North East and Yorkshire coast, it should be recognised that the technology employed in the manufacture of modern salmon and sea

trout nets was developed only 50 years ago, and that netting for sea trout using these types of net does not reflect the continuation of a long held traditional method of fishing in the net fishery.

Although commercial fishing is primarily undertaken for monetary gain, many licensees in the North East net fishery gain a significant level of satisfaction and enjoyment from net fishing activities. It is not possible to quantify this level of enjoyment, but it is recognised that reduced fishing opportunities are likely to provide a commensurate reduction in the personal enjoyment licensees derive from their participation in the net fishery.

10.4 Future levels of participation in the beach net fishery

Future levels of participation in the net fishery, and therefore both the economic value of the fishery and the impact of beach netting on stocks of salmon and sea trout, are dependent on a number of factors.

The provisions of the 2012 Net Limitation Order mean that as existing licensees retire from the fishery, their licences are not made available to new entrants. In this way the fishery reduces over time, but in such a way that those current licensees wishing to continue net fishing for sea trout may continue to do so.

The reduction in the number of licences issued in the net fishery is shown in Figure 5 and Table 1 above. There were 41 beach net licences issued I 2019, and a total of 38 net licence applications have been received for 2020.

The net fishery is likely to continue to reduce as existing licensees retire or otherwise choose to leave the fishery. A number of factors are likely to influence the rate at which current licensees leave the fishery.

The age profile of licenses is shown in Figure 18 below.

If licensees retired at the State Pension Age (currently 65) and assuming full uptake of licences in 2020, the number of licences issued in 2021 would reduce by 12 from 38 licences in 2020 to 26 in 2021. Licences issued would further reduce by 3 licensees to 23 netsmen for the 2022 netting season.

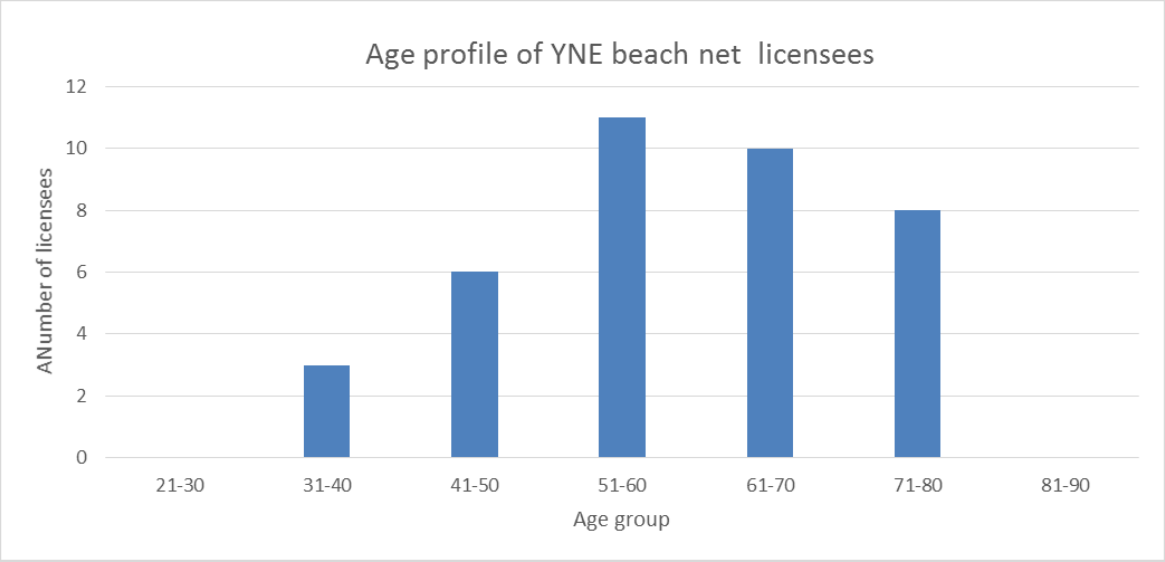

Figure 18. Age profile of beach net licensees

Any licensed netsman who has been adversely affected by the introduction of the National Salmon and Sea Trout Protection Byelaws 2018, is entitled to apply for compensation.

Section 212 of the Water Resources Act 1991 gives the Environment Agency the power to consider paying compensation to net licensees affected by byelaws, as we consider appropriate.

The decision whether to pay compensation rests with the Environment Agency alone, and is at our discretion. There is no automatic right to compensation.

Net fishery licensees affected by the byelaws are able to make a claim until 19 December 2019, the anniversary of the confirmation of the 2018 byelaws.

If licensees take the view that a sea trout only fishery over a shorter netting season is uneconomical, or that any compensation offer that may be made is their preferred option, they may choose to accept compensation and leave the fishery, accelerating the reduction in participants.

Were a compensation offer to be made and accepted, the number of licensees continuing to participate in the fishery could reduce substantially, as was the case in 2003 when the great majority of drift net licensees accepted a buyout to abandon drift net fishing.

Licensees choosing to leave the fishery may retire, take up alternative fishing options, for example potting for lobsters or crabs, or fishing for marine fish species, or seek employment in non-fisheries related areas of work.

The current NLO expires in December 2022. Maintaining an upper level on the number of beach net licences that may be issued will require this NLO to be replaced on or before that date.

11. Options for future regulation

11.1 Approaches and considerations

A number of options have been developed for the future management of the beach net fishery. These are summarised below.

Each option would have some degree of impact on the livelihoods of beach net licensees and on the stocks of salmon and sea trout exposed to the net fishery.

Our foremost consideration is the conservation of salmon and sea trout stocks, but we are mindful of the economic impact of our regulation on those who rely on fishing for sea trout as part of their livelihoods.

We recognise that factors other than exploitation in net fisheries impact upon salmon stocks, and that marine survival is one of the most important of these factors. We are working with partners to address all factors affecting salmon stocks under the Salmon Five Point Approach, including water quality, fish habitat and access improvements, as well as working to better control exploitation.

In evaluating options we will seek advice and views from all those with an interest in the future management of the net fishery, including licenced netsmen and angling, conservation and riparian interests.

Any recommendation to extend the netting season using modified designs of T and J nets would require amendments to national and regional fisheries byelaws. This would require the publication of relevant evidence, formal advertisement and response to any objections raised, and confirmation of any byelaw changes we might make by the Secretary of State.

We will closely consider the best available scientific evidence on the status of stocks of salmon and sea trout contributing to the net fishery and the impact of the fishery on those stocks.

We are seeking to achieve the best balance between providing vulnerable stocks with much needed added protection, while minimising the economic and social impacts of regulating the beach net fishery for sea trout, allowing a sea trout fishery as far as is sustainable, in line with precautionary principles.

We will give appropriate consideration to the potential impact of any proposed changes to the length of the netting season on economic growth, both for individual businesses and more widely, alongside consideration of our statutory duty to maintain, improve and develop fisheries.

The following options have been identified.

11.1 Option 1. Maintain the current beach netting season with no extension

This option would not provide any extension to the current netting season using modified nets, maintaining the existing regulation of the fishery under the existing national and regional byelaws.

Maintaining the current regulatory regime would provide the greatest level of protection for salmon and sea trout stocks, since exploitation opportunities would not be increased, but would not provide additional economic benefit for licensees.

This option would be most likely to result in an accelerated reduction in the size of the beach net fishery as licensees retired or moved to alternative economic activities.

11.2 Option 2. Extend the beach netting season on a trial basis in 2020

Restoring the netting season to the whole of the beach net fishery as part of an extended trial in 2020 would provide a more comprehensive and robust evidence base on which to evaluate the impact of netting on salmon and sea trout stocks.

Catches of both salmon and sea trout vary within and between years, and at different locations in the beach net fishery. A trial restoration of the netting season in 2020 would provide further catch and effort data from which to evaluate the impact of the net fishery using modified nets on salmon and sea trout stocks.

This would improve the economic benefit licensees derive from the sea trout fishery and increase sea trout catches, without committing to a more permanent extension.

The results from the extended trial would be used, together with other evidence including the performance of contributing stocks, to better inform a decision on whether the netting season should be restored in full or in part, more permanently.

Trial evidence suggests that relatively few salmon would be entangled, and those salmon that became entangled by the net could largely be released with minimal physical injury.

The sea trout catch would be likely to be lower than historical levels, as the modified net designs appear to be less efficient than traditional designs of T and J nets.

If participation in the net fishery in District 1 remained at current levels, and the trial results were replicated across the wider fishery for sea trout, this option might see sea trout catches reduce by around 30% from recent average levels.

The average net catch in District 1 from 2014 to 2018 is around 19.4K sea trout. A reduction of 30% would see this fall to 13.6K sea trout.

In Yorkshire, the more limited nature of trial data makes a numerical estimate of sea trout catch more difficult, but a reduction in sea trout catch would be likely compared to recent historic levels prior to the introduction of the 2018 byelaws, due to the lower efficiency of modified net designs, but higher than the catch in 2019.

11.3 Option 3. Partially restoring the beach netting season for sea trout

Netting for sea trout could be partially restored to balance providing necessary protection for salmon and sea trout stocks intercepted by the fishery and enabling licensees to derive economic benefit from netting sea trout.

The length of the netting season could be extended by different periods in different districts of the net fishery, allowing for different netting season lengths, dependent upon the predicted number of salmon and sea trout that would be netted in each district.

The netting season in District 1 could be partially restored by one or two months, to the end of June or July. Such an extension would continue to provide increased protection for salmon and sea trout stocks, but would allow a larger sea trout net catch. Similarly, the season could be extended in District 3 by a month to the end of July.

This option would see an impact on catches intermediate between Option 1 and Options 2 and 4, and provide an intermediate level of economic benefit for licensees.

11.4 Option 4. Fully restoring the beach netting season for sea trout

Reverting to the historic netting season end date of 30 August would provide the greatest economic benefit for licensees, by maximising their opportunity to catch sea trout.

This option would provide the lowest level of protection for salmon and sea trout stocks exposed to the beach net fishery.

A complete restoration of the historic netting season for sea trout would increase the netting season by three months in District 1, by two months in district 3 and by a month in Districts 4 and 5. The netting season was not reduced by the 2018 byelaws in Districts 6 and 7, as very few salmon have historically been caught in these southern parts of the beach net fishery.

As for option 2, this option might see the District 1 sea trout catch fall from an average of 19.4K sea trout to around 13.6K sea trout at current levels of participation.

In Yorkshire, a reduction in sea trout catch would be likely compared to recent historic levels prior to the introduction of the 2018 byelaws, but higher than 2019.

Fully restoring the sea trout netting season would increase the numbers of salmon entangled in the beach nets by the greatest extent.

11.5 Extending the use of modified designs of nets to the whole of the netting season

Results from the trials of modified T and J nets indicate that both designs, particularly the modified T net, are significantly less efficient at intercepting salmon than the traditional designs of net.

In order to minimise the impact of sea trout netting on salmon stocks, and to reduce the potential injury to salmon which may become entangled in the nets and require release, a requirement to use the modified designs of T and J nets over the whole of the netting season could be introduced.

This would have the advantage of offering increased protection for salmon stocks and to a lesser extent sea trout stocks in the earlier part of the netting season, as the modified designs are less efficient than traditional net configurations. The difference is particularly pronounced for the modified T net design.

Use of the modified designs of net would be likely to result in lower catches of sea trout and therefore reduce the economic benefit for licensees.

For those licensees who wished to fish only in the earlier part of the season currently stipulated by the 2018 national byelaws, and who did not wish to continue fishing later in any extended season using modified designs of nets, this option would require them to modify their fishing gear without benefiting from an extended fishing season.

This option could be adopted in parallel with any of the four options described above.

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Appendix 1: Performance of contributing stocks in England

1. River Coquet

A summary of the performance of salmon and sea trout stocks in the Coquet is given below.

1.1 Coquet salmon rod catch

The declared salmon rod catch for the river Coquet, and the five year average catch is shown in Figure 1 below:

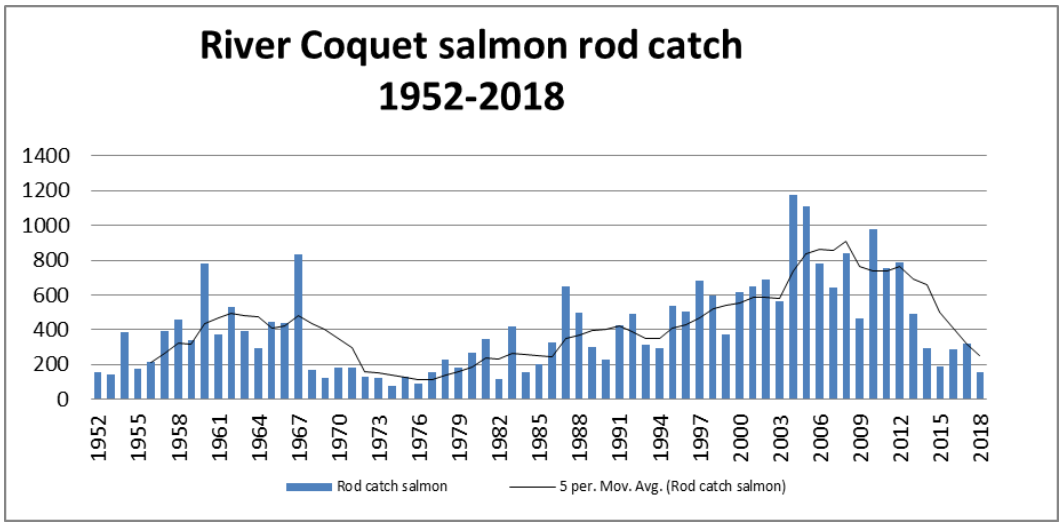

Figure 1. River Coquet declared salmon rod catch and five year average

Salmon rod catches on the Coquet show an improving trend from their lowest point in the early 1970's to a high of 1177 in 2004. Catches have fallen since that time, falling to 154 in 2018, the lowest declared salmon rod catch since 1982.

1.2 Coquet salmon spawning target compliance

Estimated compliance with the conservation limit for the Coquet is shown in Figure 2 below.

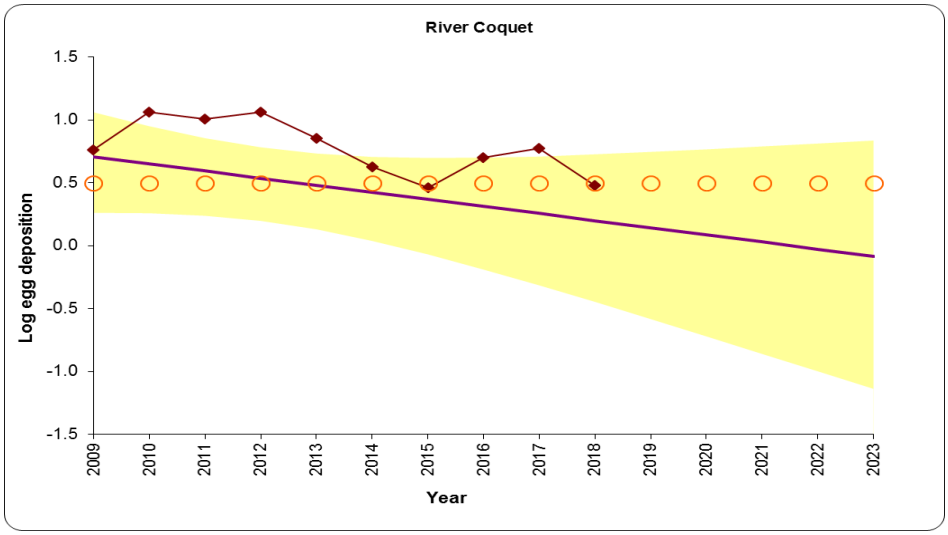

Figure 2. Egg deposition and compliance with the Conservation Limit for the River Coquet

The Coquet is currently assessed as being 'Probably at Risk' and forecast to remain 'Probably at Risk' in 2023. Egg deposition has generally been at a level above the Conservation Limit, but with an overall slightly downwards trend in deposition.

1.3 Coquet sea trout rod catch

The declared sea trout rod catch for the river Coquet, and the five year average catch is shown in Figure 3 below:

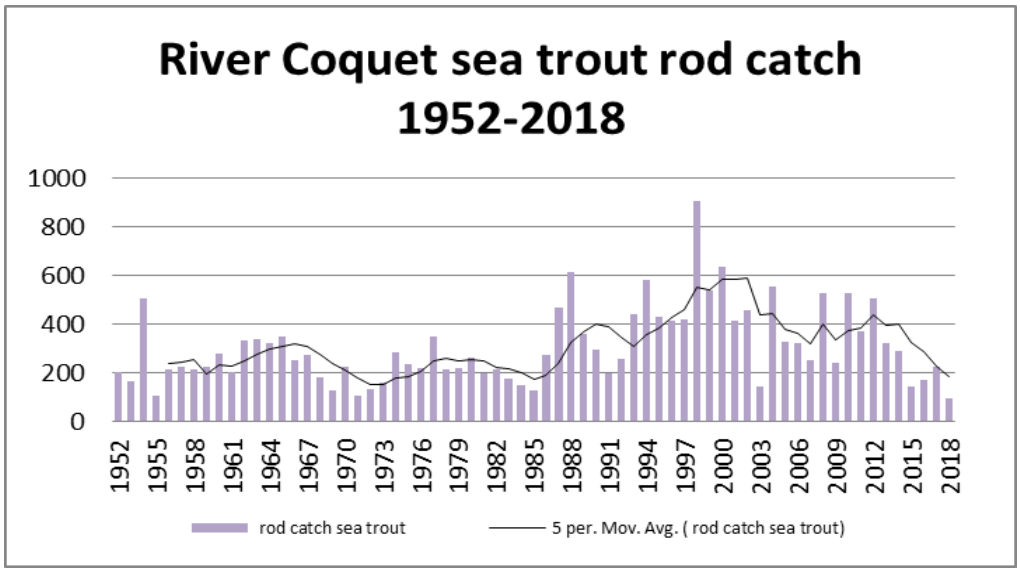

Figure 3. River Coquet declared salmon rod catch and five year average

Coquet sea trout rod catches reached a high point of 909 in 1998, but have been showing a declining trend since that time. The declared sea trout rod catch in 2018 was 96, the lowest declared sea trout rod catch in the time series. Based on the performance of the sea trout rod fishery, the Coquet's sea trout population is currently classified as 'Probably at Risk.'

2. River Tyne salmon

A summary of the performance of salmon and sea trout stocks in the Tyne is given below.

2.1 Tyne salmon rod catch

The declared salmon rod catch for the river Tyne, and the five year average catch is shown in Figure 4 below.

Following decades of industrialisation leading to severe pollution of the estuary, the Tyne's salmon population began a recovery as water quality improvements were made from the late 1960's onwards, reaching a high point of 5630 salmon in 2011. Catches have fallen since then, to a low point of 1868 in 2015. In 2018 the declared rod catch was 2535 salmon.

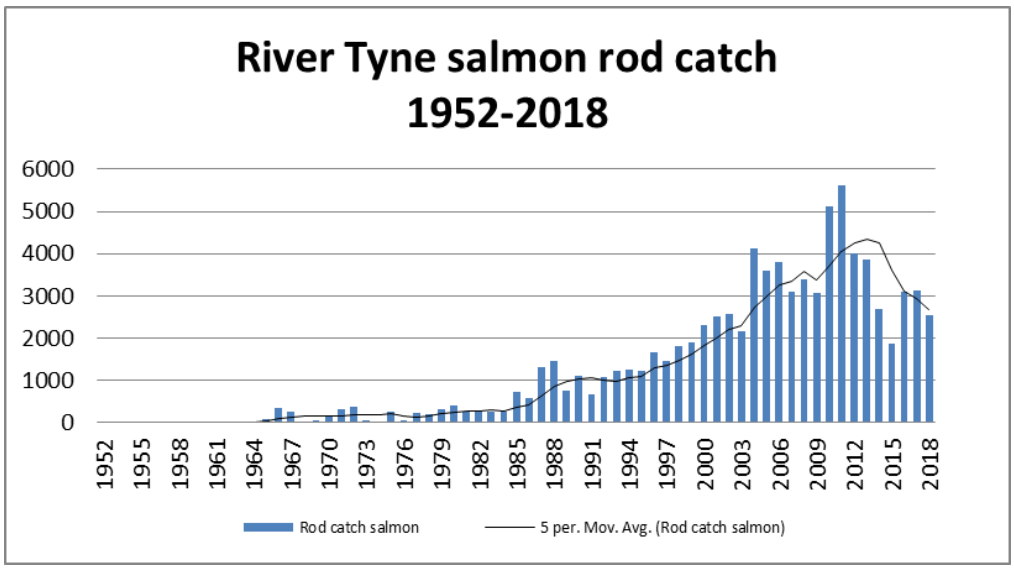

Figure 4. River Tyne declared salmon rod catch and five year average

2.2 Tyne salmon spawning target compliance

Estimated compliance with the conservation limit for the Tyne is shown in Figure 5 below. The Tyne is currently assessed as being 'Probably not at Risk' and forecast to remain 'Probably not at Risk' in 2023. Egg deposition has been above the Conservation Limit, with a slightly falling trend.

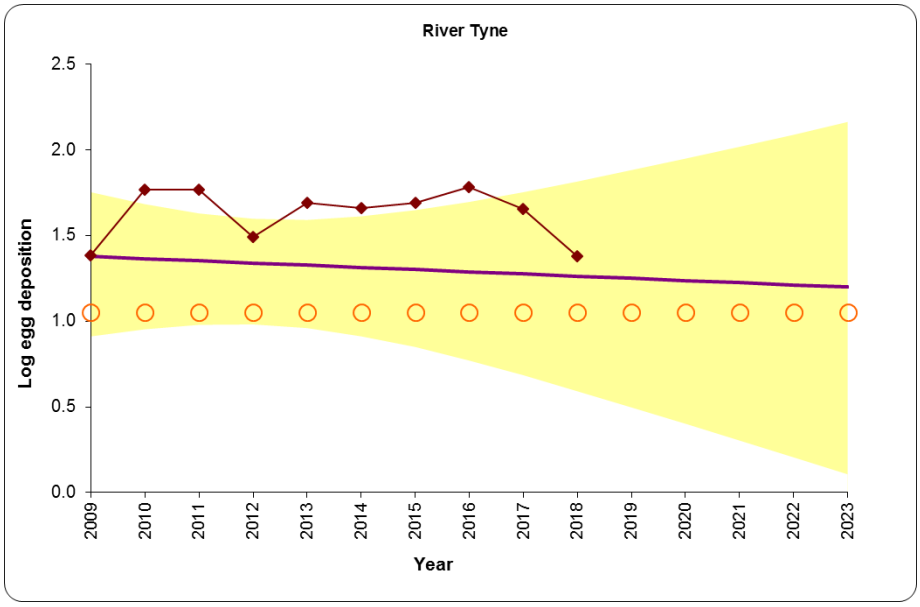

Figure 5. Egg deposition and compliance with the Conservation Limit for the River Tyne

2.3 River Tyne sea trout rod catch

The Tyne declared sea trout rod catch is shown on Figure 6 below.

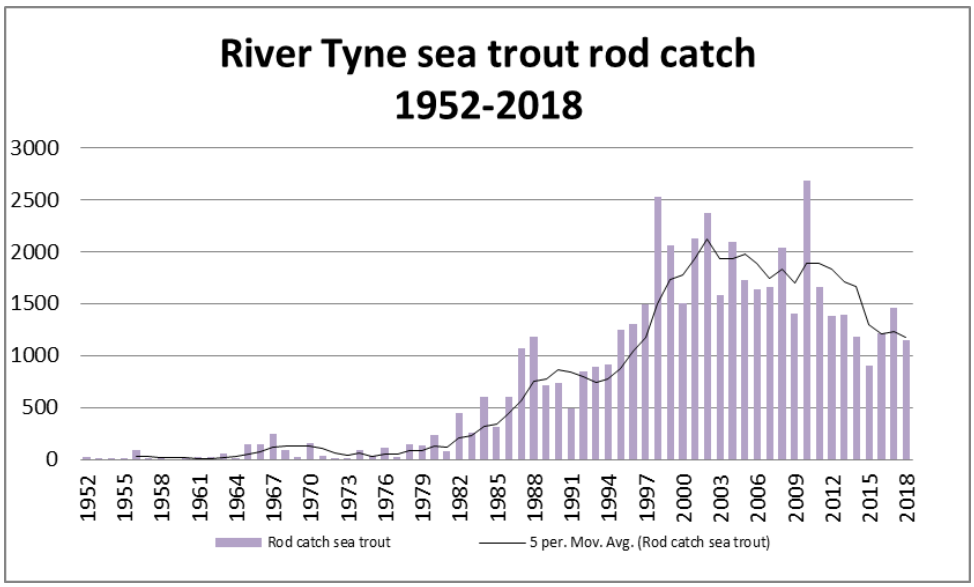

Figure 6. River Tyne declared sea trout rod catch and five year average

Sea trout rod catches closely follow those for salmon in the Tyne, with increasing rod catches reported from the late 1960's onwards, as populations responded to continued improvements to estuarine water quality, reaching a high point of 2687 sea trout in 2010. Catches have fallen since that time, to a declared catch of 1145 sea trout in 2018.

Based on the performance of the sea trout rod fishery, the Tyne's sea trout population is currently classified as 'Probably at Risk.'

2.4 River Tyne fish counter results

Total annual upstream counts of returning adult salmon and sea trout for the River Tyne are given in Figure 7 below. Where review of underwater video footage has been completed, the counts are given as salmon and sea trout separately. No split by species is available before 2004, when the camera array was installed. Footage from 2017 and 2018 has not yet been fully analysed. The 2019 year to date upstream counts (to end October) are included for completeness.

The returning stock estimates, both for combined counts and for, where available, estimates of the number of returning salmon and sea trout separately, show no clear pattern over the period.

A comparison between the estimated returning run of salmon and sea trout and the declared rod catch for each year where returning stock estimates are available for each species separately is given in Figures 8 and 9 below.

Declared rod catch and returning stock estimate for salmon and sea trout are independent measures of stock size, in that they are calculated using completely different datasets.

For both salmon and sea trout, there is a general relationship that years where a high returning stock estimate is made tend to correspond to a declared high rod catch, and vice versa.

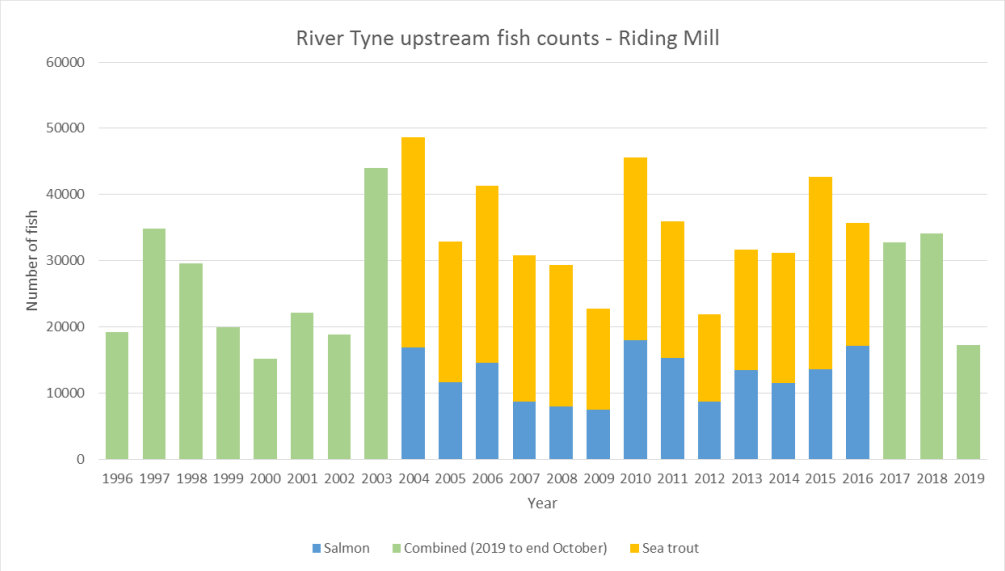

Figure 7. Upstream counts of salmonids at Riding Mill, River Tyne

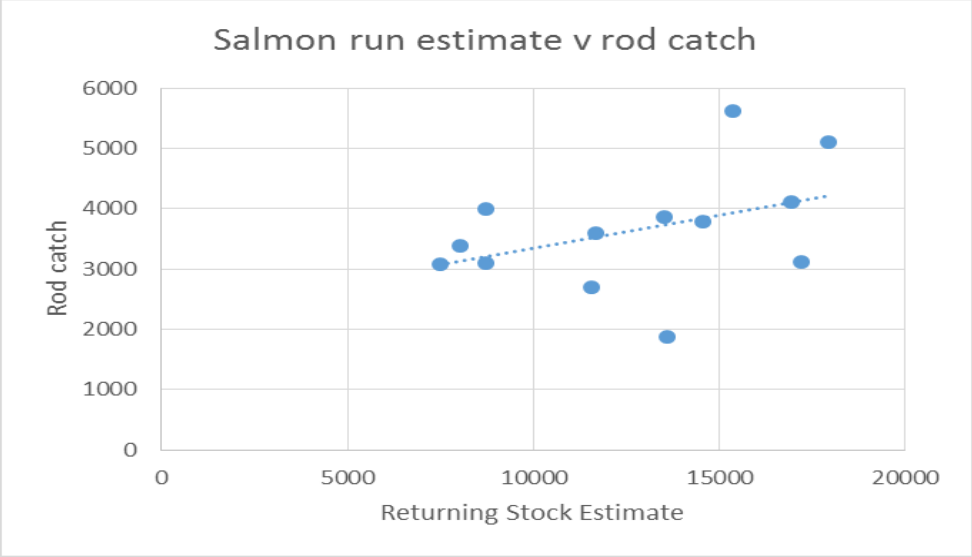

Figure 8. Tyne salmon returning stock estimate versus declared rod catch 2004 - 2016

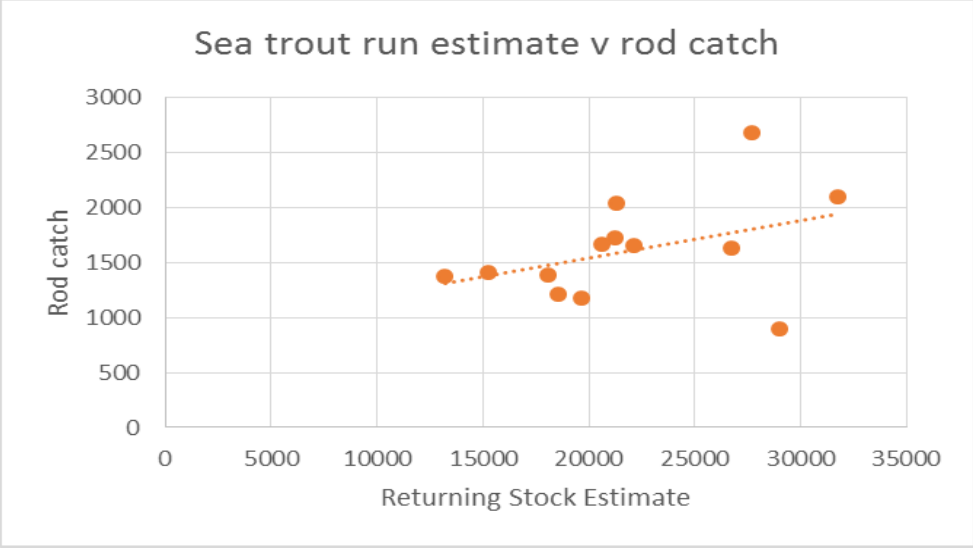

Figure 9. Tyne sea trout returning stock estimate versus declared rod catch 2004 - 2016

There are a number of caveats associated with each assessment, including that exploitation rates in the rod fishery are likely to vary between years, and the observed proportion of salmon and sea trout in video footage may not accurately represent the actual proportion of returning adult salmonids in the river.

Nevertheless, this relationship suggests that salmon and sea trout rod catches reasonably represents run sizes for the respective species on the river Tyne.

3. River Wear salmon

A summary of the performance of salmon and sea trout stocks in the Wear is given below.

3.1 Wear salmon rod catch

The declared salmon rod catch for the river Wear, and the five year average catch is shown in Figure 10 below.

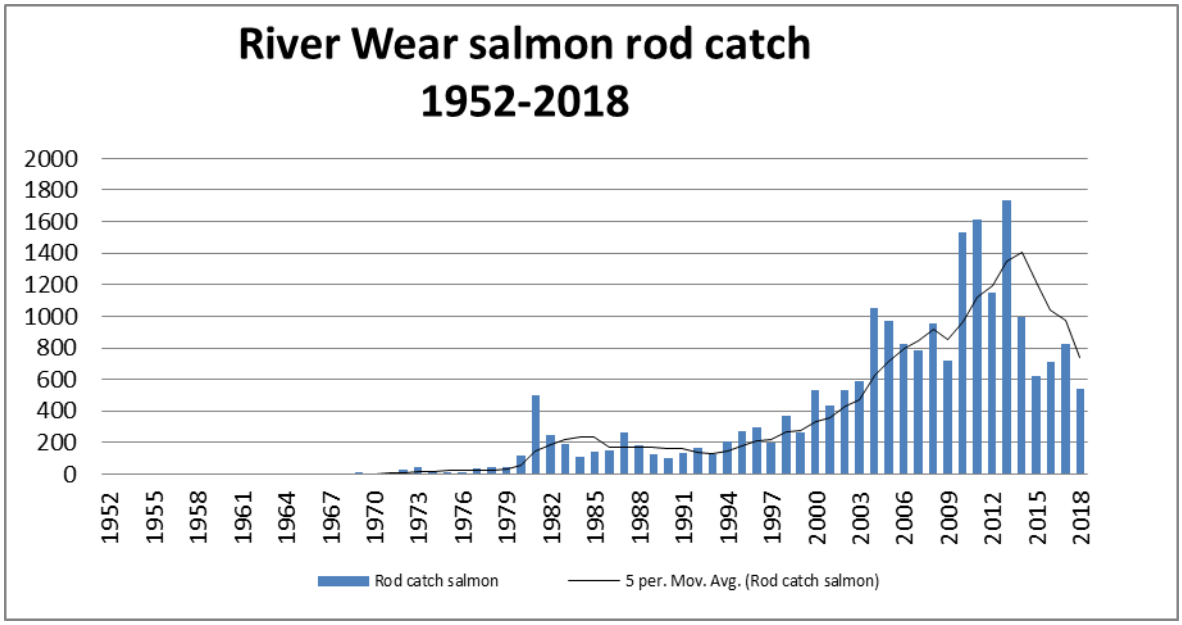

Figure 10. River Wear declared salmon rod catch and five year average

The first salmon recorded captured on rod and line in the Wear was in 1965. As estuarine water quality improved over the next four decades, and other improvements were made, salmon stocks recovered to a high point in 2013 of 1731. Catches fell markedly after this time, falling to 538 in 2018.

3.2 Wear salmon spawning target compliance

Estimated compliance with the conservation limit for the Wear is shown in Figure 11 below.

Rod catches on the Wear follow a similar pattern to the Tyne, lagged by several years, and also largely driven by improvements to estuarine water quality.

The Wear is currently assessed as being 'Probably not at Risk' and forecast to remain 'Probably not at Risk' in 2023. Egg deposition has been above the Conservation Limit, with a slightly declining trend.

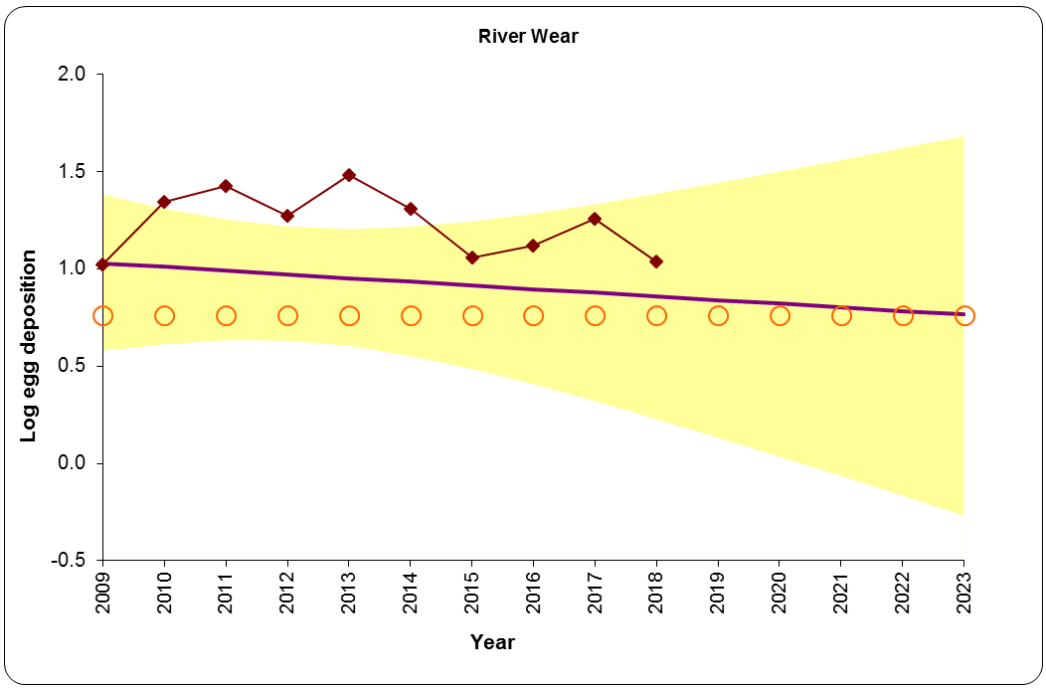

Figure 11. Egg deposition and compliance with the Conservation Limit for the River Wear

6.5.3 River Wear sea trout rod catch

The declared sea trout rod catch for the river Wear, and the five year average catch is shown in Figure 12 below.

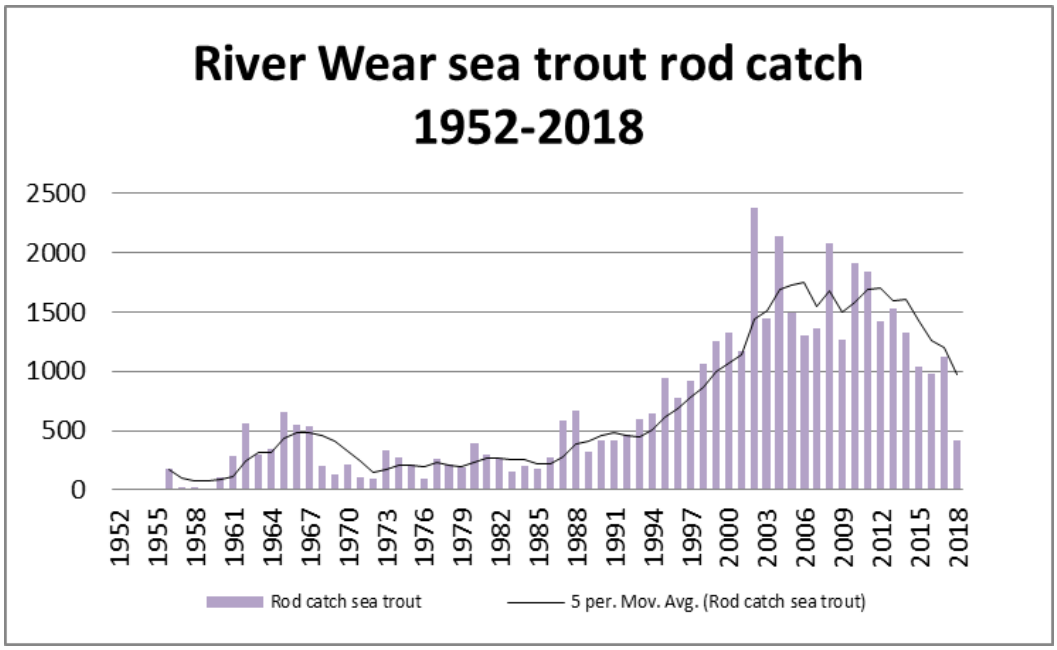

Figure 12. River Tyne declared sea trout rod catch and five year average

As with the Tyne, sea trout rod catches closely follow those for salmon in the Wear, with increasing rod catches reported from the late 1970's onwards, as populations responded to continued improvements to estuarine water quality.

Catches reached a high point of 2374 sea trout in 2002, but have since fallen, with a sea trout rod catch of 415 being recorded in 2018, the lowest recorded sea trout catch since 1986, showing a marked reduction compared to recent years.

Based on the performance of the sea trout rod fishery, the Wear's sea trout population is currently classified as 'Probably at Risk.'

3.4 River Wear fish counter results

Total annual upstream counts of returning adult salmon and sea trout for the River Wear are given in Figure 13 below. NB No data are available for 2004 and 2006. The 2019 year to date upstream counts (to end October) are included for completeness.

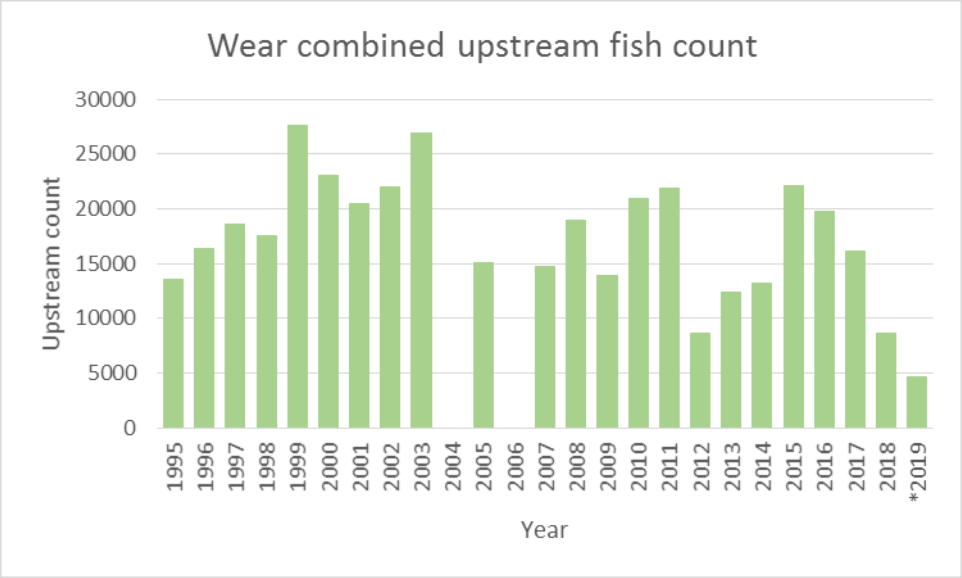

Figure 13. Combined upstream counts of salmon and sea trout for the River Wear

The returning stock estimates for the combined count of the number of returning salmon and sea trout separately shows no clear pattern over the period, although there has been a notable year-on-year decline in counts since 2015, with the 2018 and 2019 year to date counts being the lowest in the time series.

4. River Tees salmon

A summary of the performance of salmon and sea trout stocks in the Tees is given below.

4.1 Tees salmon rod catch

The declared salmon rod catch for the river Tees, and the five year average catch is shown in Figure 14 below.

As with the other rivers with heavily industrialised and urbanised estuaries in the North East, pollution saw salmon populations all but extinct in the Tees by the 1950's.

As estuarine water quality began to improve, salmon populations recolonised the river, reflected by increasing declared rod catches from the mid 1980's to a high point of 267 in 2008.

This recovery has not been sustained, and salmon catches fell substantially, reaching a low of 16 salmon in 2014, the lowest recorded salmon rod catch since 1993. In recent years, salmon catches have fallen to 16 in 2018, historically low returns for the period since the stock began recovery in the 1980s.

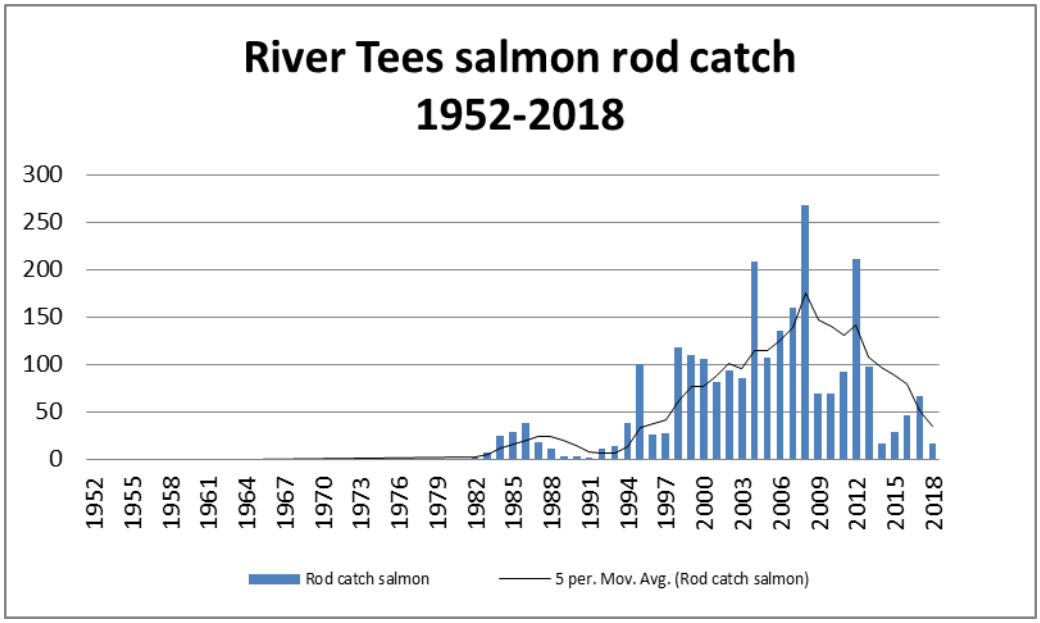

Figure 14. River Tees declared salmon rod catch and five year average

4.2 Tees salmon spawning target compliance

The estimated compliance with the conservation limit for the Tees is shown in Figure 15 below.

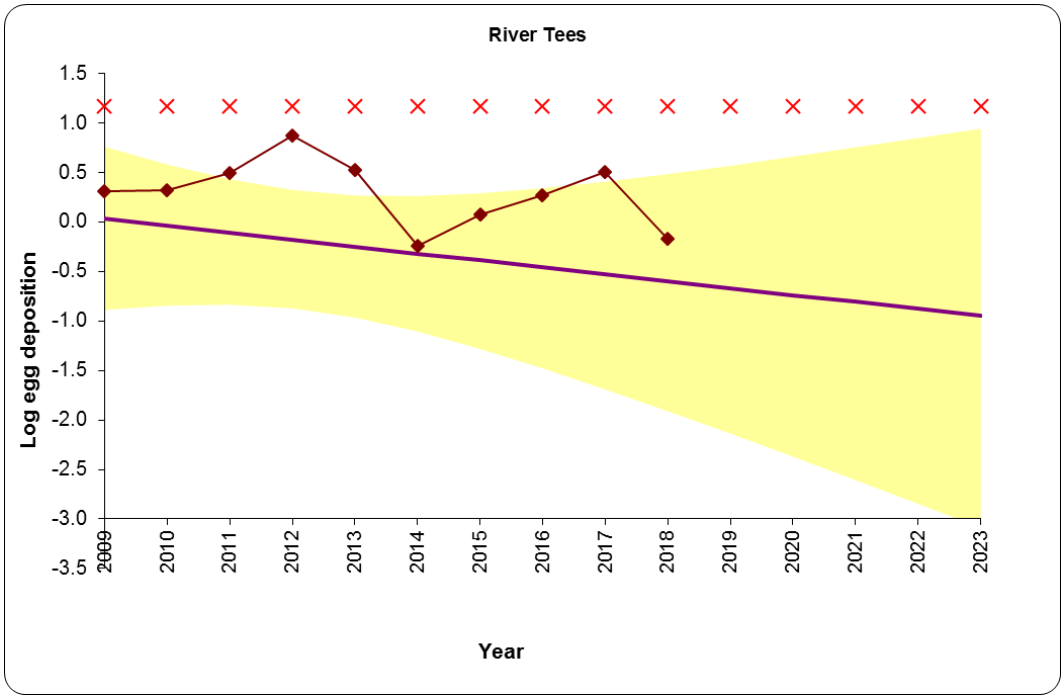

Figure 15. Egg deposition and compliance with the Conservation Limit for the River Tees

The Tees is currently assessed as being 'At Risk' and forecast to remain 'At Risk' in 2023. Spawning activity has failed to meet the Conservation Limit at any time over the last 10 years, with a declining trend in egg deposition over this period.

4.3 River Tees sea trout rod catch

The declared sea trout rod catch for the river Tees, and the five year average catch is shown in Figure 16 below.

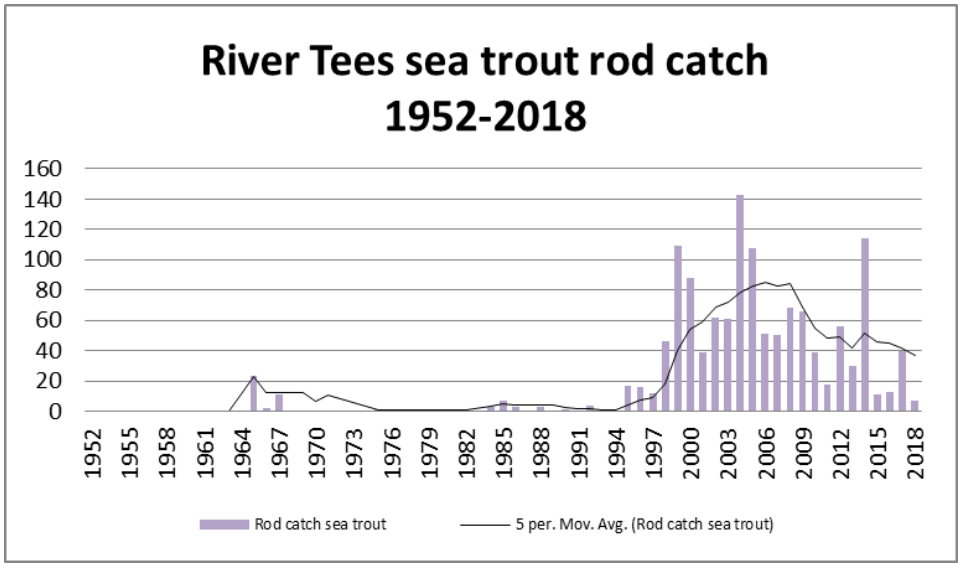

Figure 16. River Tees declared sea trout rod catch and five year average

The sea trout rod catch on the Tees follows a similar pattern to that of salmon, with increasing rod catches reported from the mid-1990's as the sea trout population recovered in response to improvements to estuarine water quality. After reaching a high point of 114 in 2014, rod catches have fallen to a low of 7 in 2018, the lowest declared catch since 1994. The unusually high reported rod catch of sea trout 2014 has been investigated, and appears to have been artificially raised by the inclusion of catches of sea trout smolts. Based on the performance of the sea trout rod fishery, the Tees sea trout population is currently classified as 'Probably at Risk.'

4.4 River Tees fish counter results

Total annual upstream counts of returning adult salmon and sea trout for the River Tees are given in Figure 17 below.

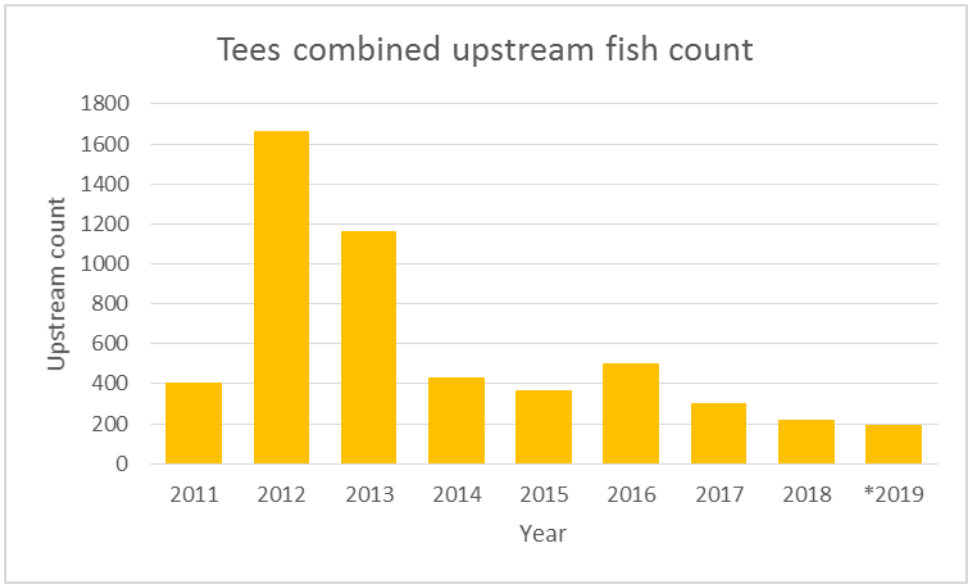

Figure 17. Upstream counts of salmon and sea trout for the River Tees

The combined count of returning adult salmon and sea trout for the River Tees should be interpreted with caution, as it represents a minimum count. Changes to the operation of the radial gates at the Tees barrage and other operational changes introduced to provide better opportunities for returning fish to migrate upstream have created multiple opportunities for upstream fish passage which circumvent the fish counter. The 2019 figure shows the total upstream count to the end October 2019.

These results are included principally for completeness.

5. River Yorkshire Esk

A summary of the performance of salmon and sea trout stocks in the Yorkshire Esk is given below.

5.1 Yorkshire Esk salmon rod catch

The declared salmon rod catch for the Yorkshire Esk, and the five year average catch is shown in Figure 18 below.

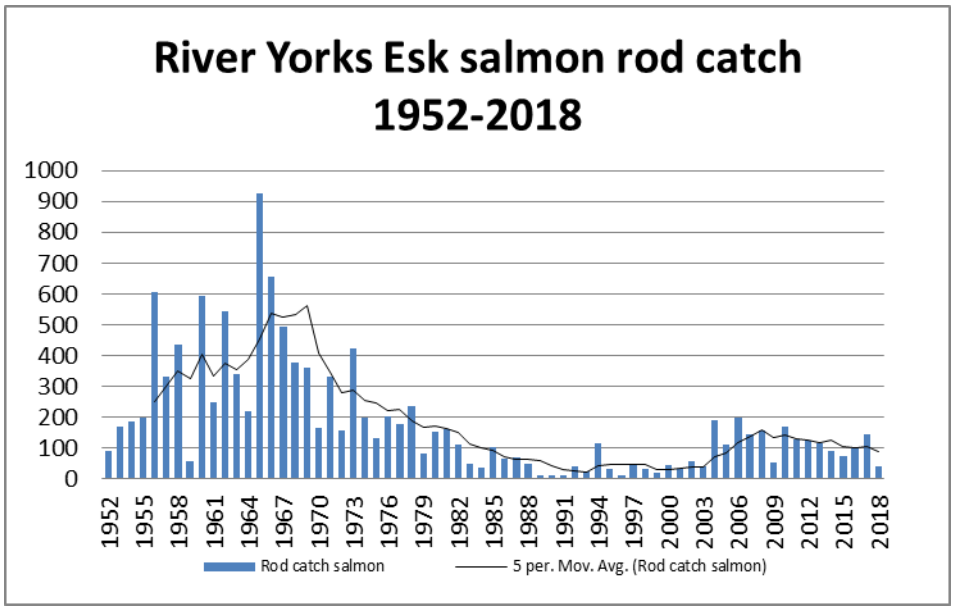

Figure 18. River Yorkshire Esk declared salmon rod catch and five year average

The Yorkshire Esk recorded its highest salmon rod catches in the late 1960's, with the highest catch of 924 recorded in 1965. Catches have fallen substantially since that time, remaining low throughout the 1980s and 1990's, improving moderately from the early 21st century. The declared rod catch in 2018 was 42 salmon, the lowest recorded catch since 2001.

5.2 Yorkshire Esk salmon spawning target compliance

Estimated compliance with the conservation limit for the Yorkshire Esk is shown in Figure 19 below. The Yorkshire Esk is currently assessed as being 'Probably at Risk' and forecast to remain as 'Probably at Risk' in 2023.

Egg deposition has been around or slightly below the Conservation Limit in recent years, with a slightly negative trend.

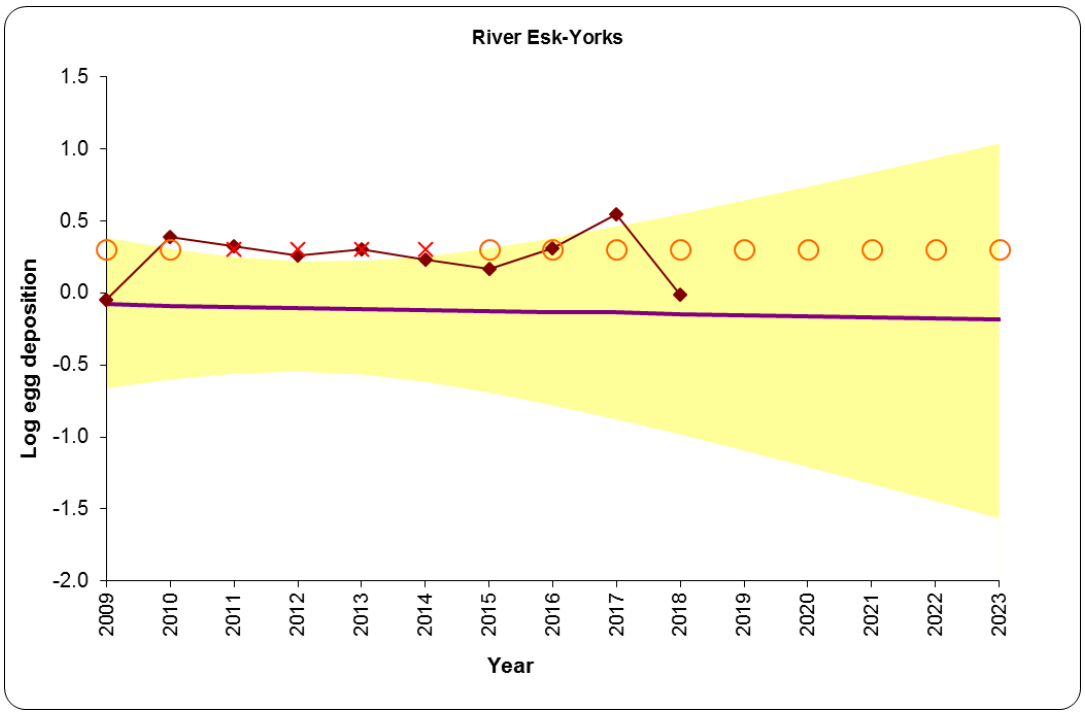

Figure 19. Egg deposition and compliance with the Conservation Limit for the River Yorkshire Esk

5.3 Yorkshire Esk sea trout rod catch

The declared sea trout rod catch for the Yorkshire Esk, and the five year average catch is shown in Figure 20 below.

Rod catches show no clear trend over the period, and in the earlier years of the 21st century years were relatively high when compared to other catches in the period. Since 2010 catches have fallen. The 2018 rod catch was 227.

Based on the performance of the sea trout rod fishery, the Yorkshire Esk sea trout population is currently classified as 'Probably at Risk.'

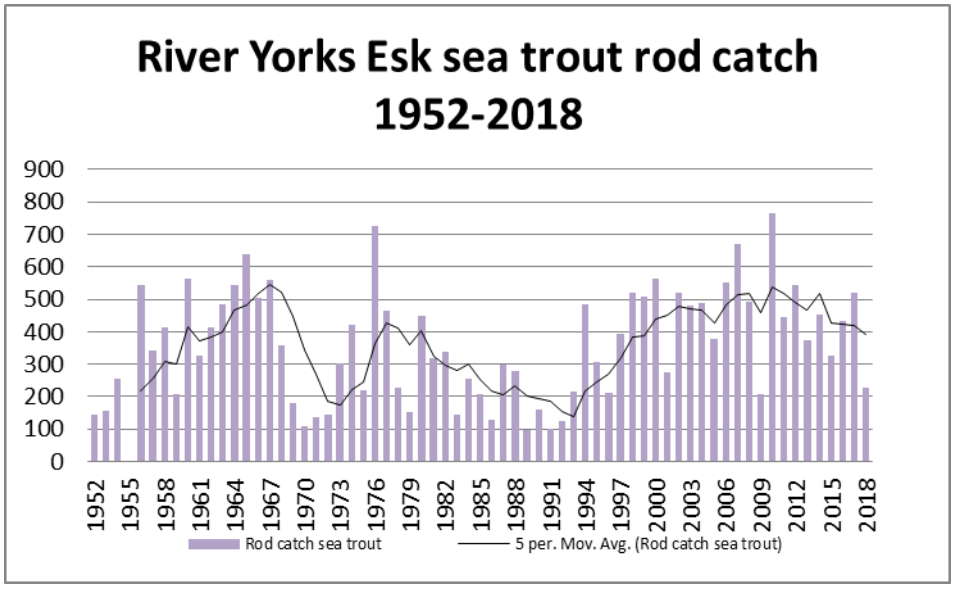

Figure 20. River Yorkshire Esk declared sea trout rod catch and five year average

6. Recovering and minor English salmon rivers

In addition to the five principal salmon rivers in the North East and Yorkshire, salmon and sea trout populations are present in a number of other rivers.

Some rivers, including the Yorkshire Ouse system, the smaller rivers Blyth and Wansbeck in Northumberland, and the Tyne Derwent, a large tributary of the Tyne, are in the early stages of recovery as salmon and sea trout populations naturally return to catchments where they have been excluded, sometimes for hundreds of years, as obstructions to fish passage are removed and water quality is improved.

The recovery of salmon populations in both the Wansbeck and Blyth catchments is at such an early stage that no historic salmon rod catches have been made, with salmon only recorded in the rod fishery in recent years, in very low numbers.

Other rivers, including the River Aln in Northumberland have not suffered to the same extent from pollution or obstructions, but only hold small populations of migratory fish, and are therefore more vulnerable to increases in pressures upon stocks, including reduced marine survival, diffuse pollution and exploitation.

These rivers do not have Conservation Limits set, and at support only small salmon and sea trout populations, which would benefit from increased protection.

6.1 Yorkshire Ouse system

The Yorkshire Ouse system, which includes the major tributary the River Ure, is in the early stages of recovery. Following the loss of its salmon and sea trout populations in the early 1950's as a result of pollution and obstructions to fish passage, salmon and sea trout began returning in the 1980's and populations have improved since that time.

The rod catch improved substantially from 2010. This may be a function both of improved returns of adult salmon, and greater fishing effort leading to increased exploitation, as salmon stocks continue to recover. The catch reached a high point of close to 200 salmon in 2016, but had fallen to 62 salmon by 2018.

The River Ouse salmon rod catch since 1990 is shown in Figure 21 below.

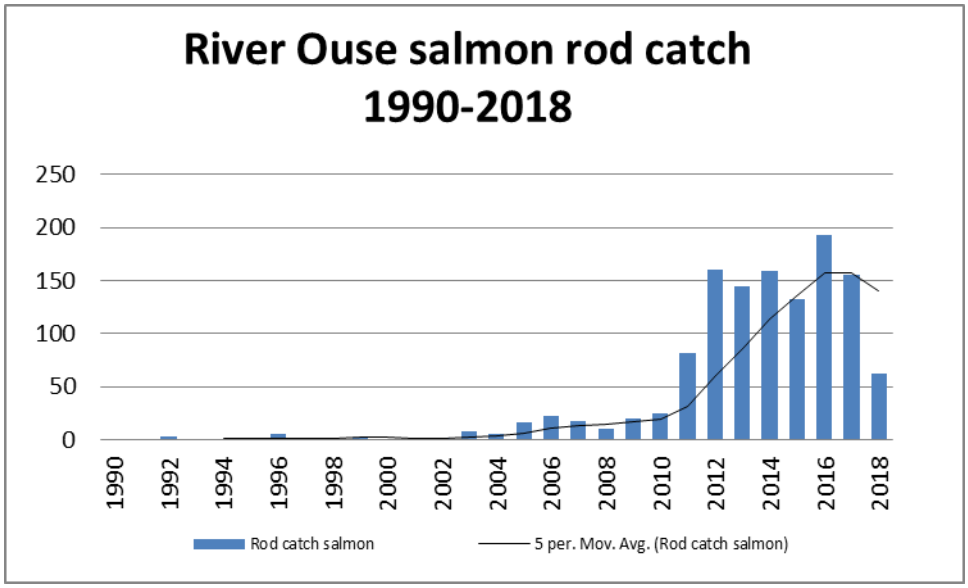

Figure 21. River Ouse declared salmon rod catch and five year average

The River Ouse sea trout rod catch since 1990 is shown in Figure 22 below.

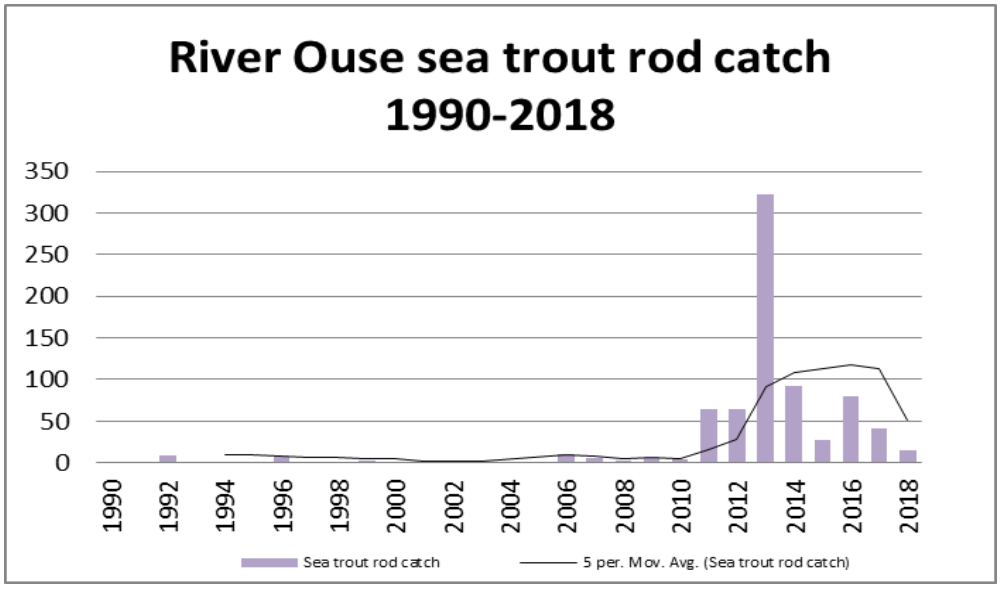

Figure 22. River Ouse declared sea trout rod catch and five year average

Sea trout catches on the River Ouse improved from 2010, but have since fallen back to low levels. The 2018 declared rod catch for sea trout was 15 fish. The anomalous return from 2013 should be treated with caution. It is believed the annual return for this year may include brown trout and/or sea trout smolts in the total return.

6.2 River Aln

The River Aln salmon rod catch since 1990 is shown in Figure 23 below.

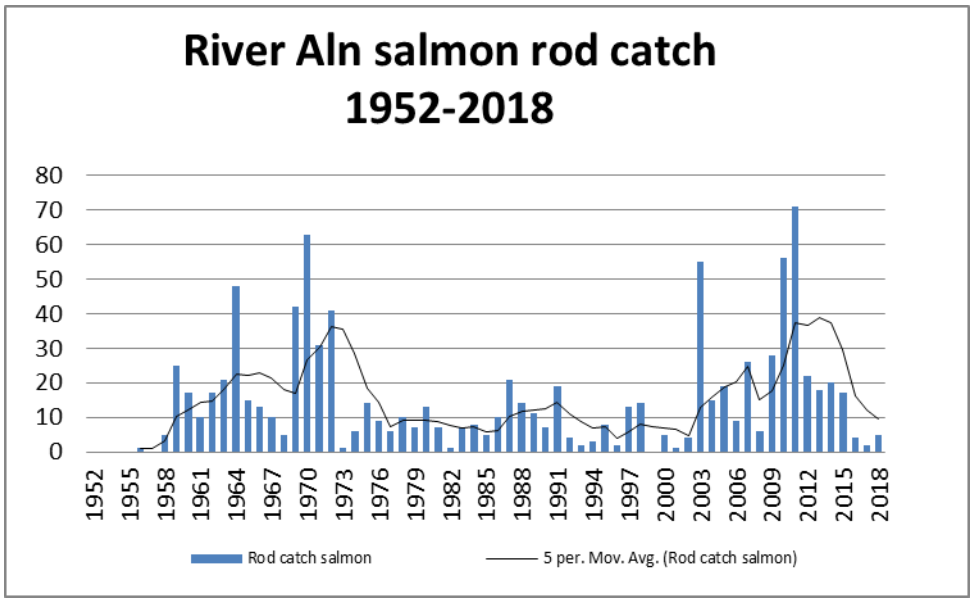

Figure 23. River Aln declared salmon rod catch and five year average

The Aln has shown a variable rod catch over this time period, with higher catches in the early 1970's, followed by lower rod catches from the mid-1970's to the early 2000's. The salmon rod

catch reached a peak of 71 fish in 2011, but has fallen to single figures over the last three years, with a declared rod catch of 5 salmon in 2018.

The River Aln sea trout rod catch since 1990 is shown in Figure 24 below.

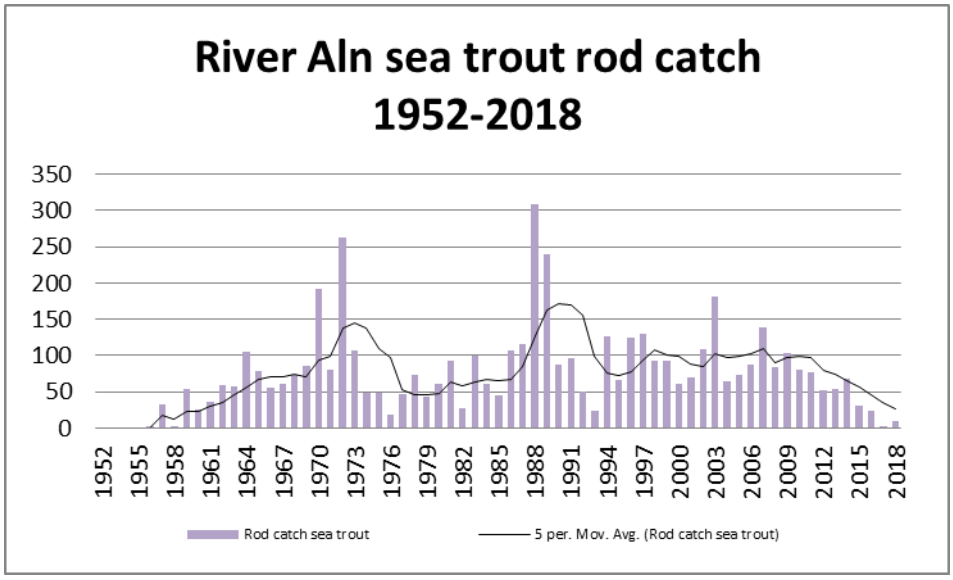

Figure 24. River Aln declared sea trout rod catch and five year average

Sea trout rod catches on the Aln have been variable across the time period, showing a marked downwards trend in recent years. The 2017 declared sea trout rod catch of 3 fish was the lowest recorded catch since 1958, and the 2018 catch of 9 sea trout the second lowest since that year.

Appendix 2: Performance of contributing stocks in Scotland

1 River Tweed

Declared salmon catches on the River Tweed since 1991 are shown in Figure 1 below.

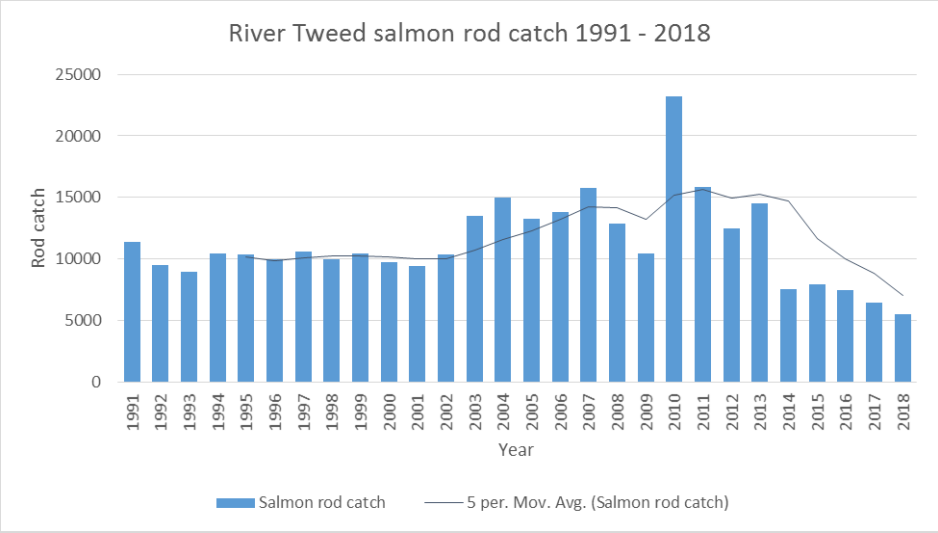

Figure 1. River Tweed salmon rod catch and five year average

Stable catches through the 1990's increased in the 2000's to a high of 23179 in 2010, but have fallen subsequently to 5560 in 2018, the lowest catch reported over the 27 year reporting period.

Declared sea trout catches on the River Tweed are shown in Figure 2 below.

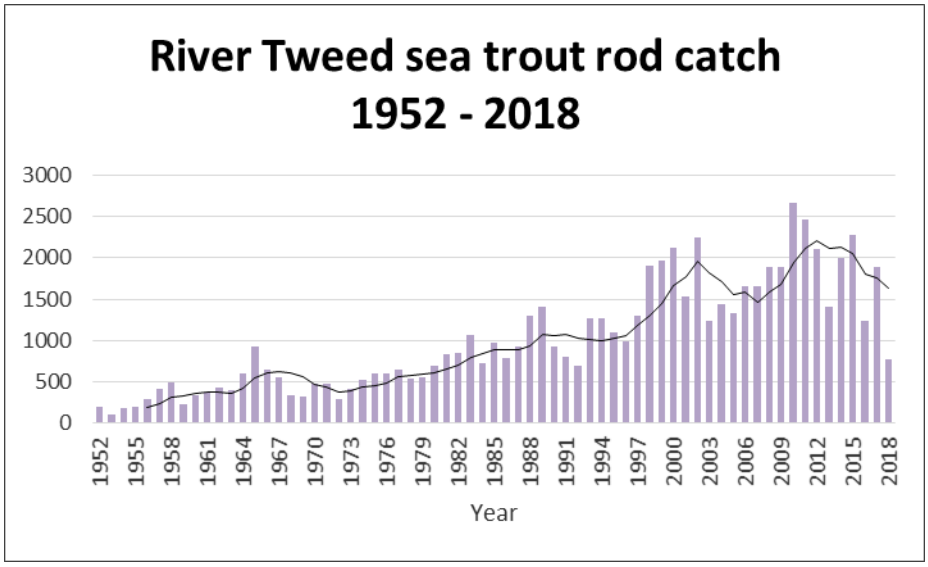

Figure 2. River Tweed sea trout rod catch and five year average

Sea trout rod catches have shown a moderate upward trend from the 1950's to 2010, but have declined since that time to a rod catch of 775 recorded in 2018, the lowest rod catch since 1984.

2. River Forth

Declared salmon catches on the River Forth are shown in Figure 3 below.

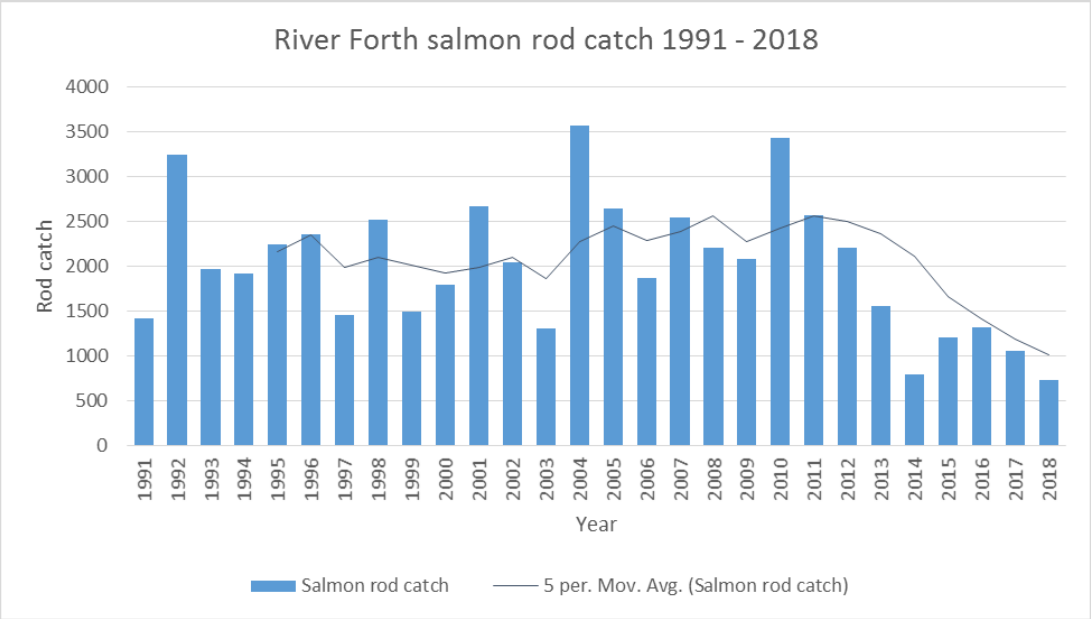

Figure 3. River Forth salmon rod catch and five year average

Stable catches were reported in the Forth District through the 1990's, increasing in the 2000's. Catches reach a high of 3579 in 2004, but have fallen subsequently to a low of 790 in 2014. In 2018 the declared rod catch was 729 salmon.

3. River Tay

A summary of the performance of salmon and sea trout stocks in the Tay is given below.

Declared salmon catches on the River Tay are shown in Figure 4 below.

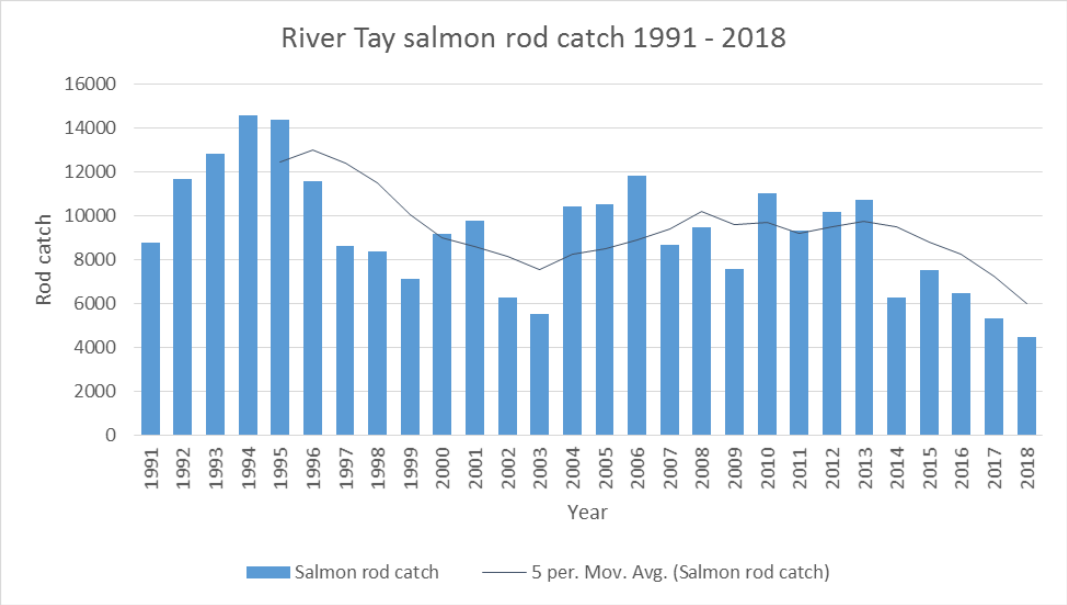

Figure 4. River Tay salmon rod catch and five year average

The salmon rod catch on the Tay shows a declining trend across the time series, with notably lower rod catches in the last five years. The salmon rod catch in 2018 was 4471, the lowest in the time series.

5. River South Esk

Declared salmon catches on the River Tay are shown in Figure 5 below.

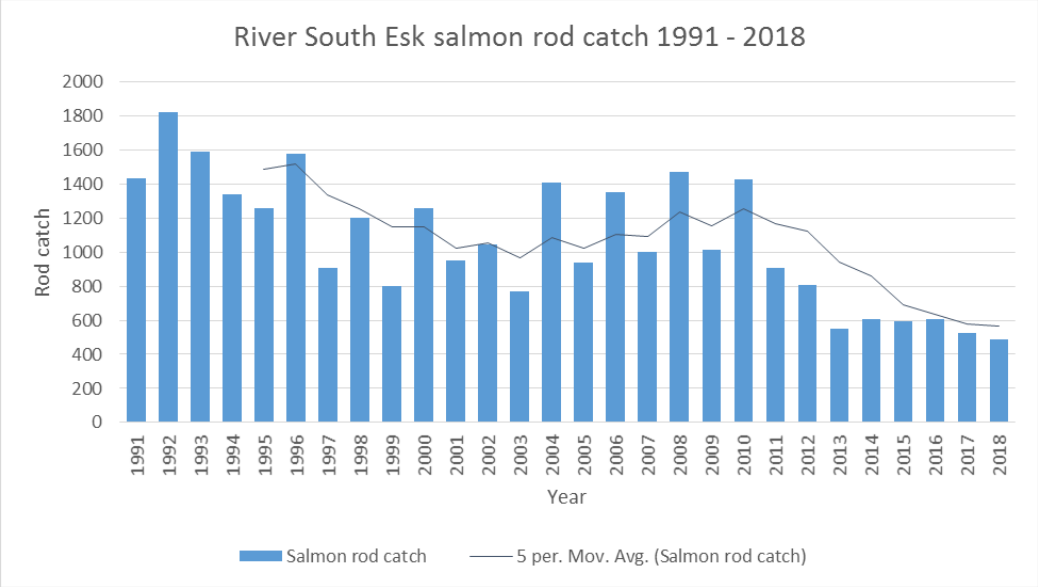

Figure 5. South Esk salmon rod catch and five year average

Salmon rod catches have fallen over the period, and the 2018 declared catch of 485 salmon is the lowest in the time series.

6. River North Esk

Declared salmon catches on the River North Esk are shown in Figure 6 below.

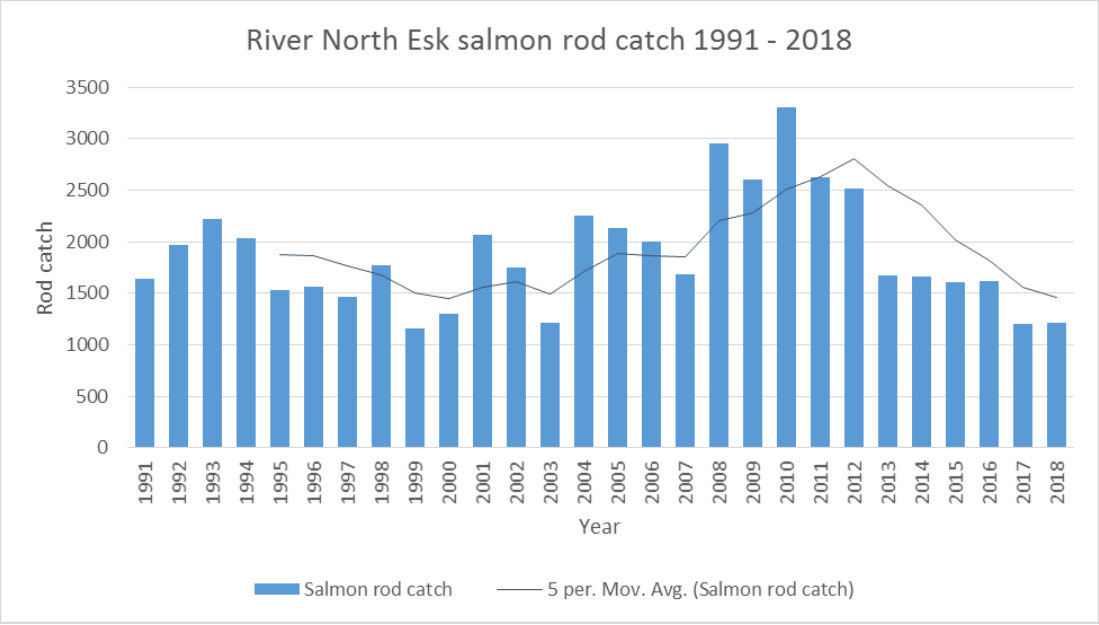

Figure 6. North Esk salmon rod catch and five year average

Stable catches were reported in the North Esk through the 1990's, increasing in the 2000's. Catches reached a high of 3308 in 2010. Rod catches have fallen subsequently to 1212 in 2018.

7. River Dee

Declared salmon catches on the River North Esk are shown in Figure 7 below.

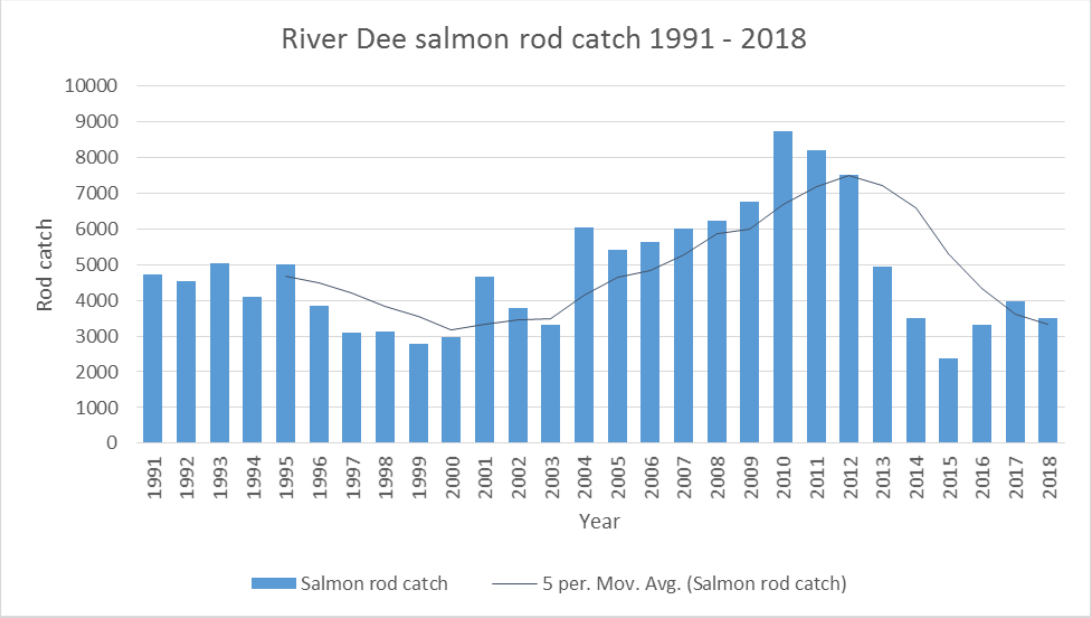

Figure 7. Dee salmon rod catch and five year average

Relatively stable catches were reported in the Dee through the 1990's, increasing in the 2000's to a high point of 8728 in 2010. Rod catches have declined since then, falling to a low of 2365 in 2015. The declared salmon rod catch in 2018 was 3500.

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